TEST REPORT

Applicant:

Address of Applicant:

Equipment Under Test (EUT)

Product Name: WIRELESS CHARGER

Brand Name:

Model No.:

Applicable standards: EN 55032:2015+A11:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019
EN 61000-3-3:2013+A1:2019

Date of sample receipt: August 3, 2022

Date of Test: August 3, 2022 To August 11, 2022

Date of report issued: August 11, 2022

Test Result : PASS*

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

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

Authorized Signature

Kevin Wang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*August 11, 2022*	*Original*

Prepared By: Gary Wang ***Date:*** *August 11, 2022*

Project Engineer

Reviewed By: Kevin Wang ***Date:*** *August 11, 2022*

Reviewer

3 Contents

4 Test Summary

Test Item	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission	EN 55032	EN 55032	Class B	PASS
Conducted Emission	EN 55032	EN 55032	Class B	PASS
Harmonic Current Emission	EN IEC 61000-3-2	EN IEC 61000-3-2	N/A	N/A
Voltage Fluctuations and Flicker	EN 61000-3-3	EN 61000-3-3	Clause 5 of EN 61000-3-3	PASS
Electrostatic discharges	EN 55035	EN 61000-4-2	4kV Contact Discharge 8kV Air Discharge	PASS
Radiated Immunity (80MHz-1GHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz,)	EN 55035	EN 61000-4-3	3V/m 80%, 1kHz, AM	PASS
Electrical Fast Transients	EN 55035	EN 61000-4- 4	AC±1.0kV, Earth ±2.0kV Signal Line 0.5kV	PASS
Surges	EN 55035	EN 61000-4-5	1.2/50μs Tr/Td 1kV Line to Line 2kV Line to Ground	PASS
Conducted Immunity	EN 55035	EN 61000-4-6	3Vrms (emf), 80%, 1kHz Amp. Mod.	PASS
Voltage Dips and Interruptions	EN 55035	EN 61000-4-11	<5% residual voltage for 0.5 periods: B 70% residual voltage for 25 periods: C <5% residual voltage for 250 periods: C	PASS

Remark:
Pass: Comply with the essential requirements in the standard.
N/A: Not applicable.

5 General Information

5.1 Client Information

Applicant:	DIGIVIEW TECHNOLOGY LIMITED
Address of Applicant:	Room 509, 5/F, Tian Shu Block, Xinggang Tongchuanghui, No.6099 Baoan District, Shenzhen, GuangDong, China
Manufacturer:	DIGIVIEW TECHNOLOGY LIMITED
Address of Manufacturer:	Room 509, 5/F, Tian Shu Block, Xinggang Tongchuanghui, No.6099 Baoan District, Shenzhen, GuangDong, China

5.2 General Description of E.U.T

Product Name:	WIRELESS CHARGER
Brand Name:	
Model No.:	W90-R
Power Supply:	Input: DC 9V, 2A Output:15W

5.3 Test mode

On mode:	Keep the EUT in the operation status.

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number
DELTA	ADAPTER	ADP-60ADT	N/A
HUAWEI	Mobile Phone	P40	N/A

5.5 Deviation from Standards

None.

5.6 Abnormalities from Standard Conditions

None.

5.7 Monitoring of EUT for All Immunity Test

Visual:	Monitor the EUT operating status.
Audio:	N/A

6 Test Instruments List

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Jul. 2 2022	Jul. 1 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jun. 28 2022	Jun. 27 2023
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Jun. 28 2022	Jun. 27 2023
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	Jun. 28 2022	Jun. 27 2023
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Jun. 28 2022	Jun. 27 2023
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Jun. 28 2022	Jun. 27 2023
9	Coaxial Cable	GTS	N/A	GTS211	Jun. 28 2022	Jun. 27 2023
10	Coaxial cable	GTS	N/A	GTS210	Jun. 28 2022	Jun. 27 2023
11	Coaxial Cable	GTS	N/A	GTS212	Jun. 28 2022	Jun. 27 2023
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jun. 28 2022	Jun. 27 2023
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	Jun. 28 2022	Jun. 27 2023
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Jun. 28 2022	Jun. 27 2023
15	Band filter	Amindeon	82346	GTS219	Jun. 28 2022	Jun. 27 2023
16	Power Meter	Anritsu	ML2495A	GTS540	Jun. 28 2022	Jun. 27 2023
17	Power Sensor	Anritsu	MA2411B	GTS541	Jun. 28 2022	Jun. 27 2023
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	Jun. 28 2022	Jun. 27 2023
19	Splitter	Agilent	11636B	GTS237	Jun. 28 2022	Jun. 27 2023
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	Jun. 28 2022	Jun. 27 2023
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Jun. 28 2022	Jun. 27 2023
22	Amplifier	TDK	PA-02-02	GTS574	Jun. 28 2022	Jun. 27 2023
23	Amplifier	TDK	PA-02-03	GTS576	Jun. 28 2022	Jun. 27 2023
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	Jun. 28 2022	Jun. 27 2023

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	Jul. 2 2022	Jul. 1 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	Jun. 28 2022	Jun. 27 2023
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jun. 28 2022	Jun. 27 2023
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	Jun. 28 2022	Jun. 27 2023
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	Jun. 28 2022	Jun. 27 2023
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	Jun. 28 2022	Jun. 27 2023
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	Jun. 28 2022	Jun. 27 2023

ESD						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	ESD Simulator	KIKUSUI	KES4021A	GTS242	Jun. 28 2022	Jun. 27 2023
2	Thermo meter	KTJ	TA328	GTS243	Jun. 28 2022	Jun. 27 2023

Conducted Immunity						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Signal Generator	ROHDE & SCHWARZ	SMB 100A	GTS553	Jun. 28 2022	Jun. 27 2023
2	CDN	LionCEL	CDN-M3-16	GTS554	Jun. 28 2022	Jun. 27 2023
3	CDN	CYBERTEK	EM 5070	GTS559	Jun. 28 2022	Jun. 27 2023
4	Power amplifier	rflight	NTWPA-00010475	GTS555	Jun. 28 2022	Jun. 27 2023
5	ATT	SUNWAVE	SJ-50-06DB	GTS556	Jun. 28 2022	Jun. 27 2023
6	Clamp	SCHAFFNER	KEMZ 801	GTS558	Jun. 28 2022	Jun. 27 2023

Harmonic/ Flicker						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Power Analyzer H/F	EMTEST	DPA500	GTS235	Jun. 28 2022	Jun. 27 2023
2	AC POWER SUPPLY	EMTEST	ACS500	GTS236	Jun. 28 2022	Jun. 27 2023
3	Thermo meter	KTJ	TA328	GTS256	Jun. 28 2022	Jun. 27 2023

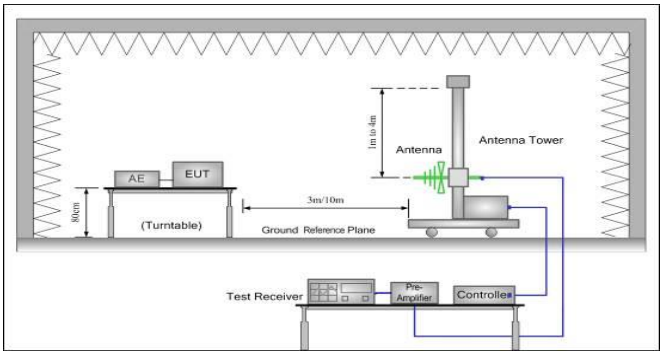
EFT, Surge, Voltage dips and Interruption						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	EMTEST system	EMTEST	UCS500N	GTS239	Jun. 28 2022	Jun. 27 2023
2	Clamp	EMTEST	HFK	GTS557	Jun. 28 2022	Jun. 27 2023
3	Thermo meter	KTJ	TA328	GTS238	Jun. 28 2022	Jun. 27 2023

Radiated Immunity						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	Jun. 28 2022	Jun. 27 2023
2	Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	Jun. 28 2022	Jun. 27 2023
3	Stacked Log.-Per.-Broadband Antenna (70MHz-10GHz)	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A
4	Signal Generator (9kHz-6GHz)	Rohde & Schwarz	SMB100A	SEM006-11	Jun. 28 2022	Jun. 27 2023
5	Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	Jun. 28 2022	Jun. 27 2023
6	Broadband Amplifier(800MHz-3GHz)	Rohde & Schwarz	BBA150-D110	SEM005-13	Jun. 28 2022	Jun. 27 2023
7	Broadband Amplifier(2.5GHz-6GHz)	Rohde & Schwarz	BBA150-E60	SEM005-16	Jun. 28 2022	Jun. 27 2023
8	Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	Jun. 28 2022	Jun. 27 2023
2	Barometer	ChangChun	DYM3	GTS255	Jun. 28 2022	Jun. 27 2023

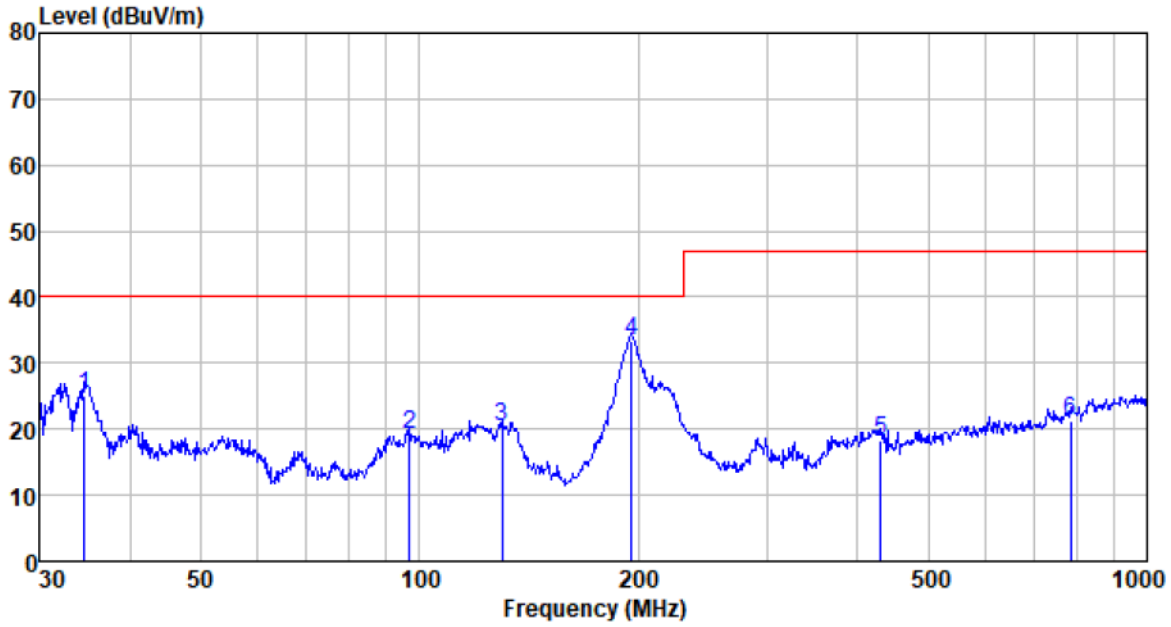
7 Emission Test Results

7.1 Radiated Emission

Test Requirement:	EN 55032
Test Method:	EN 55032
Test Frequency Range:	30MHz to 1GHz
Class / Severity:	Class B
Measurement Distance:	3m
Limit:	Frequency / Limit (dBμV/m @3m) / Value 30MHz-230MHz / 40.00 / Quasi-peak 230MHz-1GHz / 47.00 / Quasi-peak
Test setup:	
Test Procedure:	1. The radiated emissions test was conducted in a semi-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
Test environment:	Temp.: 25 °C / Humid.: 52% / Press.: 1 012mbar
Measurement Record:	**Uncertainty: ± 4.50dB**
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

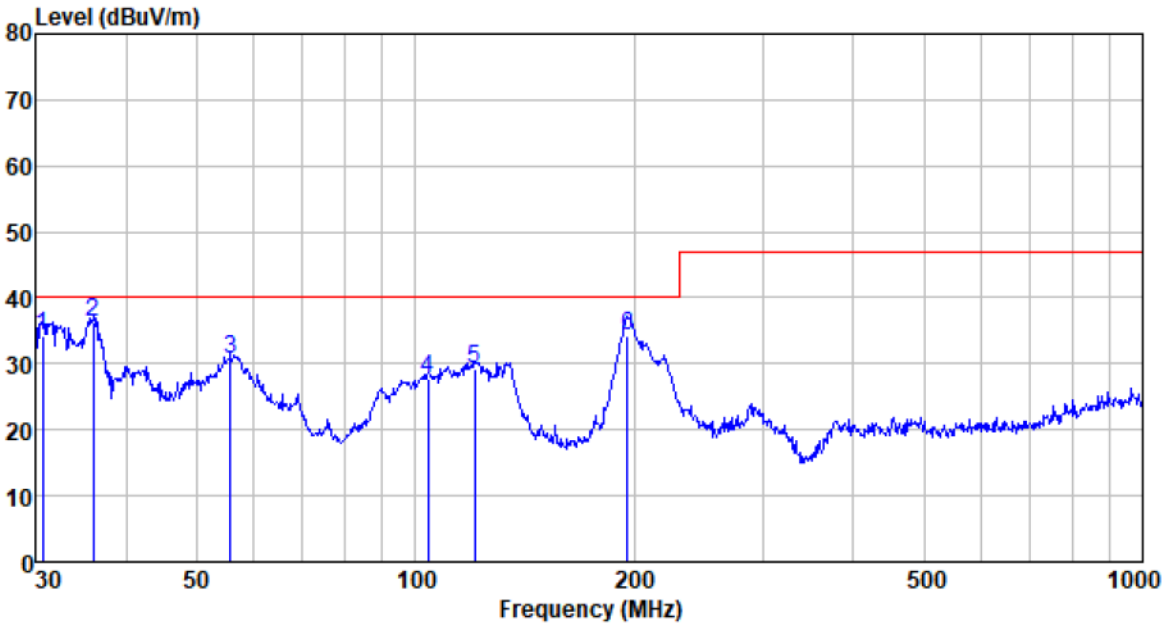
Measurement Data

Test mode:	On mode	Polarization:	Horizontal



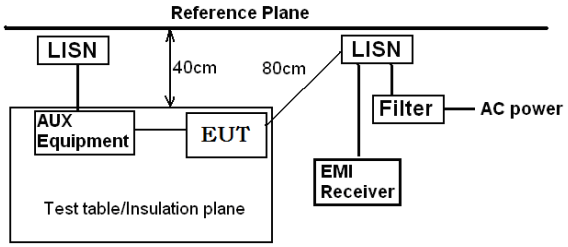
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
34.639	48.45	11.29	0.61	35.33	25.02	40.00	-14.98	QP
96.775	42.93	11.72	1.17	36.69	19.13	40.00	-20.87	QP
129.923	47.70	8.20	1.44	36.95	20.39	40.00	-19.61	QP
195.822	58.79	10.17	1.82	37.31	33.47	40.00	-6.53	QP
431.032	36.72	15.99	3.00	37.52	18.19	47.00	-28.81	QP
785.093	33.32	21.15	4.40	37.62	21.25	47.00	-25.75	QP

Test mode:	On mode	Polarization:	Vertical



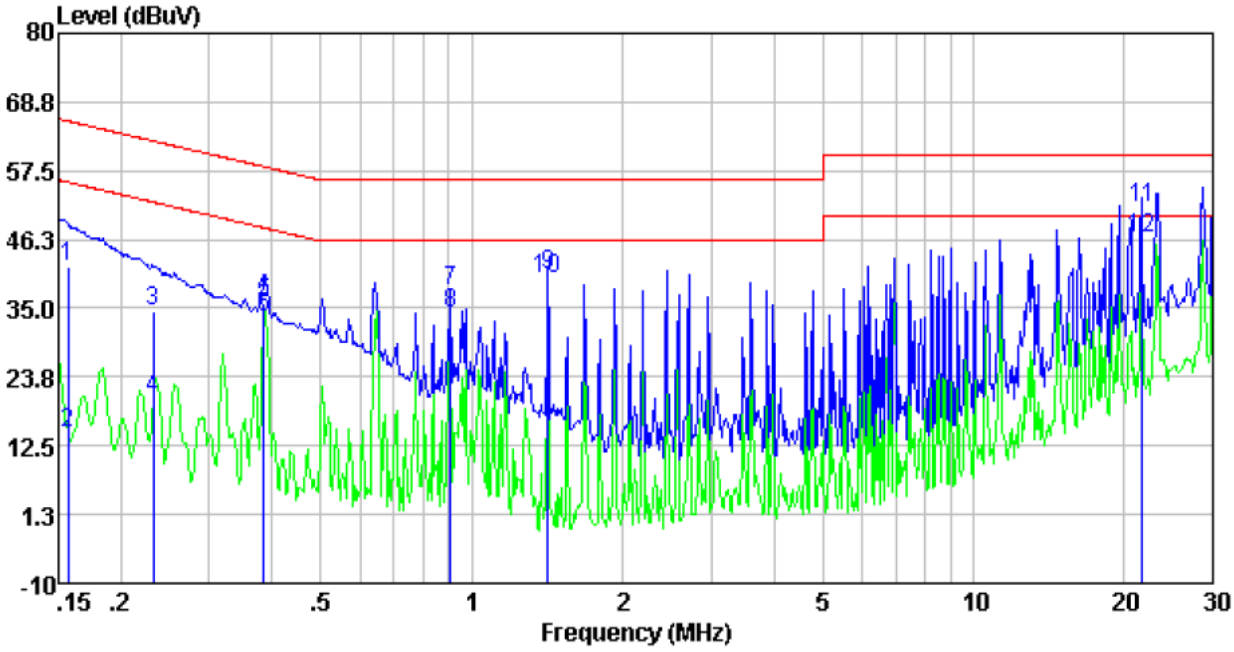
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
30.745	57.53	11.22	0.56	35.06	34.25	40.00	-5.75	QP
36.001	59.48	11.52	0.62	35.42	36.20	40.00	-3.80	QP
55.609	54.42	11.73	0.82	36.26	30.71	40.00	-9.29	QP
104.170	51.54	11.73	1.23	36.76	27.74	40.00	-12.26	QP
120.699	55.38	9.42	1.37	36.89	29.28	40.00	-10.72	QP
195.822	59.55	10.17	1.82	37.31	34.23	40.00	-5.77	QP

7.2 Conducted Emission

Test Requirement:	EN 55032
Test Method:	EN 55032
Test Frequency Range:	150kHz to 30MHz
Class / Severity:	Class B
Limit:	**AC Port** Frequency range (MHz) / Limit (dBµV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (LISN). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to EN55032 Class B on conducted measurement.
Test environment:	Temp.: 24 °C / Humid.: 51% / Press.: 1012mbar
Measurement Record:	**Uncertainty: ±3.45dB**
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

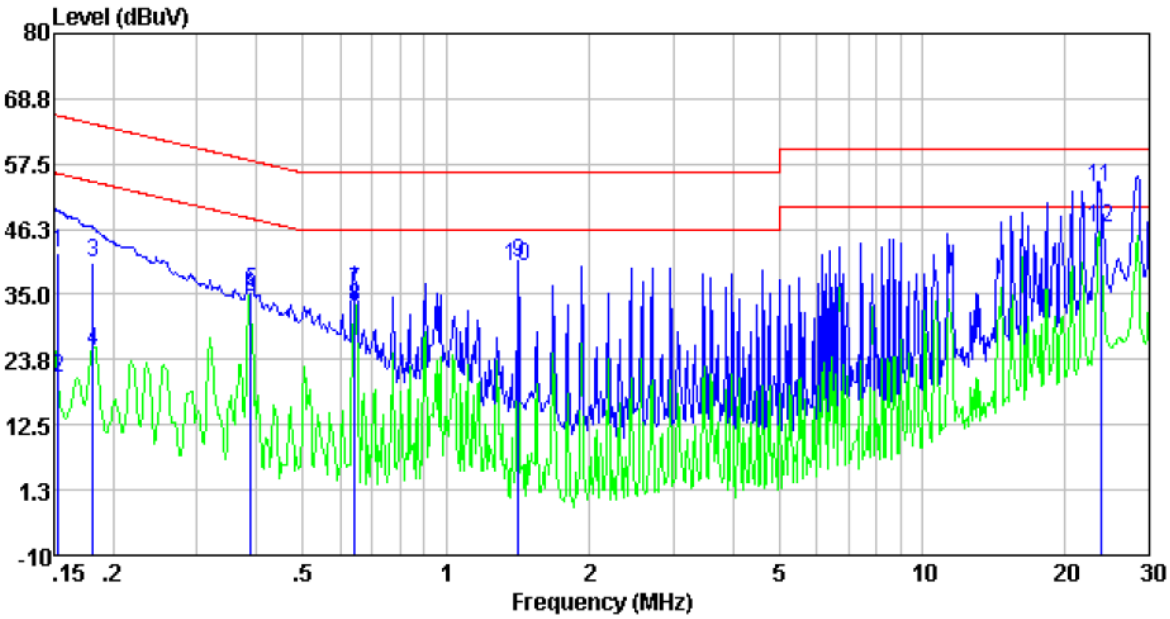
Measurement Data

Test mode:	On mode	Phase Polarity:	Line



Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.16	31.34	10.40	0.01	41.75	65.65	-23.90	QP
0.16	4.22	10.40	0.01	14.63	55.65	-41.02	Average
0.23	24.07	10.40	0.01	34.48	62.39	-27.91	QP
0.23	9.80	10.40	0.01	20.21	52.39	-32.18	Average
0.39	25.37	10.36	0.01	35.74	58.17	-22.43	QP
0.39	22.99	10.36	0.01	33.36	48.17	-14.81	Average
0.91	27.48	10.22	0.03	37.73	56.00	-18.27	QP
0.91	23.91	10.22	0.03	34.16	46.00	-11.84	Average
1.42	30.12	10.20	0.04	40.36	56.00	-15.64	QP
1.42	29.55	10.20	0.04	39.79	46.00	-6.21	Average
21.72	40.91	10.32	0.19	51.42	60.00	-8.58	QP
21.72	35.80	10.32	0.19	46.31	50.00	-3.69	Average

Test mode:	On mode	Phase Polarity:	Neutral



Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.15	31.87	10.40	0.01	42.28	65.82	-23.54	QP
0.15	10.04	10.40	0.01	20.45	55.82	-35.37	Average
0.18	29.91	10.40	0.01	40.32	64.42	-24.10	QP
0.18	14.82	10.40	0.01	25.23	54.42	-29.19	Average
0.39	25.02	10.36	0.01	35.39	58.08	-22.69	QP
0.39	24.27	10.36	0.01	34.64	48.08	-13.44	Average
0.64	25.13	10.27	0.02	35.42	56.00	-20.58	QP
0.64	22.43	10.27	0.02	32.72	46.00	-13.28	Average
1.42	30.40	10.20	0.04	40.64	56.00	-15.36	QP
1.42	29.48	10.20	0.04	39.72	46.00	-6.28	Average
23.76	42.80	10.34	0.19	53.33	60.00	-6.67	QP
23.76	36.01	10.34	0.19	46.54	50.00	-3.46	Average

7.3 Harmonics Test Results

Test Requirement:	EN IEC 61000-3-2
Test Method:	N/A (See Remark)
Remark:	There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN IEC 61000-3-2. For further details, please refer to Clause 7, Note 1 of EN IEC 61000-3-2 which states: "For the following categories of equipment limits are not specified in this edition of the standard. Note 1: Equipment with a rated power of 75W or less, other than lighting equipment."

7.4 Flicker Test Result

Test Requirement:	EN 61000-3-3		
Test Method:	EN 61000-3-3		
Class/Severity:	Clause 5 of EN 61000-3-3		
Measurement Time:	10 min		
Detector:	As per EN 61000-3-3		
Test environment:	Temp.: 24°C	Humid.: 51%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data

	EUT values	Limit	Result
Pst	0.036	1.00	PASS
Plt	0.068	0.65	PASS
Dc[%]	0.000	3.30	PASS
Dmax[%]	0.045	4.00	PASS
Dt [s]	0.000	0.50	PASS

8 Immunity Test Results

8.1 General Performance Criteria Description in EN 55035

Criterion A: The equipment shall continue to operate as intended without operator intervention.

No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

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

Criterion B: During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance.

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

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

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

8.2 Performance Criteria Description for Broadcast reception function

The broadcast reception function shall comply with the general performance criteria given in Clause 8 and any relevant annex with the deviations defined in Table A.2.

NOTE For the continuous RF electromagnetic field immunity test specified in the table clauses 1.2 and 1.3, deviations apply for in-band frequencies. The deviations depend on the class of the broadcast receiver (Group 1 or 2) and are defined in Table A.2.

Table A.2 – Modified test levels for performance criterion A for the broadcast reception function

<table>
<tr><th>Performance criteria</th><th>Test type table clause</th><th>Group 1</th><th>Group 2</th></tr>
<tr><td rowspan="2">A</td><td>1.2
1.3</td><td>The disturbance level is reduced to 1 V/m for in-band frequencies.</td><td rowspan="2">No test 2.1 requirements apply</td></tr>
<tr><td>2.1
3.1
4.1</td><td>The disturbance level is reduced to 1 V for in-band frequencies.</td></tr>
<tr><td colspan="4">In-band is defined as the entire tuneable operating range of the selected broadcast reception function.
The tuned channel ±0,5 MHz (lower edge frequency – 0,5 MHz up to the upper edge frequency + 0,5 MHz of the tuned channel) is excluded from testing.
NOTE In some countries, there is a requirement to test the tuned channels. Refer to the relevant regional requirements for guidance.</td></tr>
</table>

8.3 Performance Criteria Description for Print function

Criterion A

Apply criterion A as defined in 8.2. Additionally, the following shall not occur as a consequence of the application of the disturbance:

- change of operating state;
- unintended pausing of the print operation;
- a change of print quality or legibility, as appropriate to the test pattern;
- change of character font;
- unintended line feed;
- unintended page feed;
- paper feed failure.

Criterion B

Apply criterion B as defined in 8.3 with the following specifics and additional limitations.

Paper feed failures are allowed only if, after removal of the jammed sheets, the job is automatically recovered and there is no loss of printed information.

Any low-quality print output caused by the application of the disturbance shall not continue beyond the sheet of media being printed, or beyond the typical length of a finished page or sheet printed from continuous roll media.

False indicators are permitted during the test provided that a normal operator response to that false indicator is simple (such as pressing a button). False indicators are not acceptable if they would cause the user to discard printing supplies such as ink, toner or paper, when those supplies are actually not empty or faulty. Any false indicator shall either clear automatically or after the operator's response.

After the disturbance, the print function may print the remainder of the print job at a quality level within the manufacturer's specifications. Alternately, the print function may halt processing of a print job as a result of the disturbance, but only if the operator is capable of reprinting the job (for example, a fax printing job where the image to be printed still resides in local memory). Automatically restarting the print job from the beginning is also acceptable. In any scenario, the pairing of front and back images during double-sided printing shall be correct.

Criterion C

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

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

8.4 Performance Criteria Description for Scan function

Criterion A Apply criterion A as defined in 8.2. Additionally, the following shall not occur as a consequence of the application of the test:

•change of settings, such as which side(s) of the page to be scanned, colour or monochrome, and resolution;

• corruption of the image, for example stretching, compressing or change in colour;

• paper feed failures;

• errors in the reading of bar codes.

Criterion B Apply criterion B as defined in 8.3 with the following specifics and additional limitations:

• Document feed failures are allowed only if the original documents are undamaged and, after removal of the jammed sheets, the job is automatically recovered and there is no loss of scanned information.

• During the test, the representation of the image shall not be degraded such that reading mistakes occur.

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

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

8.5 Performance Criteria Description for Display and display output functions

Performance criterion A for continuous radiated and conducted disturbances tests

Apply criterion A as defined in 8.2. Additionally, an increase in any degradation greater than just perceptible by observation of the image shall not occur as a consequence of the application of the test. Examples of such degradations are:

• superimposed patterning;

• positional disturbances due to synchronisation errors;

• geometric distortion;

• change of contrast or brightness;

• picture artefacts;

• freezing or disturbance of motion;

• image loss;

• video data or decoding errors.

Performance criterion A for the power frequency magnetic field tests

Alternative 1: A continuous magnetic field of 1 A/m:

The jitter (in mm) shall not exceed the value $\frac{(\text{character height in mm} + 0{,}3) \times 2{,}5}{33{,}3}$

Alternative 2: An increased power frequency magnetic field ≤ 50 A/m:

The amplitude of the disturbing field shall be increased by a factor K, where 1 ≤ K ≤ 50. The jitter shall not exceed K times the value given in alternative 1. The value of K should be chosen to avoid saturation of any magnetic screening materials.

When the EUT is subjected to fields above K = 1 and the performance criteria are satisfied for all relevant functions of the EUT, the EUT shall be deemed to satisfy the requirement. When the EUT is subjected to fields above K = 1 and the display function is shown to meet these performance criteria, but the performance criteria for other relevant functions are NOT satisfied, the EUT shall be retested at K = 1 (the field level required in table clause 1.1) to assess compliance for those other functions.

Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance.

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

Performance criterion C

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

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

8.6 Performance Criteria Description for Musical tone generating function General

The particular performance criteria for evaluating the musical tone generating function are defined in E.3.2,E.3.3 and E.3.4.

Performance criterion A

Performance criterion A is subdivided according to the type of equipment and its use. Three subgroups corresponding to different equipment types are defined in Table E.1 and have corresponding performance criteria A1, A2 and A3. The relevant subgroup shall be selected by the manufacturer in accordance with the product specification. The description of criteria.

A1, A2 and A3 are presented in Table E.2.

Table E.1 – Subgroups and performance criteria A for the musical tone generating function

Equipment type and use	Subgroup	Performance Criteria
High-end quality suitable for professional use or studio recording	**1**	**A1**
Middle grade quality suitable for amateur use or home use	**2**	**A2**
Entry grade quality for practice or exercise use	**3**	**A3**

Table E.2 – Performance criteria for different subgroups given in Table E.1

Description of degradation In performance	Performance Criteria		
	A1	**A2**	**A3**
Specific unintended change in the characteristic of the tone generated 1. interruption 2. stopping (or ceasing) 3. holding 4. sudden change in amplification	Not acceptable	Not acceptable	Not acceptable
Specific unintended change in the characteristic of the tone generated 1. frequency 2. harmonic distortion	Not acceptable	Not acceptable if the degradation is beyond the level specified by the manufacturer	Not acceptable if the manufacturer judges such degradations interfere with the continuation of playing music
Other changes in the type of tone generated	Not acceptable	Not acceptable	Not acceptable if the manufacturer judges such degradations interfere with the continuation of playing music
The specified degradations shall be perceptible to a listener. During the test no performance degradation other than that permitted by this table is allowed. After the test			

the EUT shall operate without performance degradation.

Performance criterion B

During the test, degradation of performance beyond that defined in criterion A1 of Table E.2 is allowed.

However, sudden amplification of tone to a level that exceeds the expected level by more than 6 dB is not allowed.

After the test, normal operation of the EUT shall be self-recovered.

In the case of unintended tone holding caused by a MIDI protocol communication error, the EUT can be reinitialized by the operation of the controls by the user controls in accordance with the manufacturer's instructions.

Due to the nature of the MIDI protocol, it is necessary to modify the performance criterion B to allow user intervention when the unintended tone holding is caused by a missing MIDI communication error (for example missing a 'NOTE OFF' message).

Performance criterion C

Degradation of the performance beyond that defined in criterion A1 of Table E.2 is permitted provided that the normal operation of the EUT can be restored after the test by operator intervention. However, sudden amplification of tone to a level that exceeds the expected level by more than 6 dB is not allowed.

8.7 Performance Criteria Description for Networking functions

General Requirements for Network functions

Performance criterion A

Where relevant, during the application of the test the network function shall, as a minimum, operate ensuring that:

- established connections shall be maintained throughout the application of the test;
- no change of operational state or corruption of stored data occurs;
- no increase in error rate above the figure defined by the manufacturer occurs. The manufacturer should select the most appropriate performance measurement criteria for the product or system, for example bit error rate, block error rate;
- no request for retry above the figure defined by the manufacturer;
- the data transmission rate does not reduce below the figure defined by the manufacturer;
- no protocol failure occurs;
- the audio noise level at a two-wire analogue interface (supporting telephony) shall satisfy the requirements of Table G.3. The audio level measurements shall be performed at the demodulated frequency of the disturbance using a narrowband filter with a 3dB bandwidth of 100 Hz using the method defined in table clause G.1.4. See G.6.1.

  As described in the example given in J.3.5 the networking function is monitored during testing using direct functions specified elsewhere in this document.

  If needed to verify the operation of the protocol, the following functions shall be verified as described in Table H.1 when performing the additional spot frequency tests contained inClause 5:

- ability to establish a connection,
- ability to clear a connection.

  Where an EUT has supervisory functions they shall not be affected. Elements that should be monitored include, but are not limited to:

- alarms,
- signalling lamps,
- printer output errors,
- network traffic rates,
- network monitor errors,
- measured network parameters.

Performance criterion B

Established connections shall be maintained throughout the test, or shall self-recover in a way and timescale that is imperceptible to the user.

The error rate, request for retry and data transmission rates may be degraded during the application of the test. Degradation of the performance as described in criterion A is permitted, provided that the normal operation of the EUT is self-recoverable to the condition established prior to the application of the test.

Where required, as defined in Clause 5, the acceptable operation of the function shall be verified at the completion of the test as described in Table H.1, by confirming the following:

- the EUT’s ability to establish a connection,
- the EUT’s ability to clear a connection.

  During surge testing disconnection is allowed on the analogue/digital data port being tested.

If the EUT is a supervisory equipment, it shall not impact the normal operation of the network being monitored. In addition, any supervisory functions impacted during the period of the test shall return to the state prior to the test. Elements to consider include:

- alarms,
- signalling lamps,
- printer output,
- network traffic rates,
- network monitoring.

Performance criterion C

Degradation of performance as described in criteria A and B is permitted provided that the normal operation of the EUT is self-recoverable to the condition immediately before the application of the test, or can be restored after the test by the operator.

Requirements for CPE containing xDSL ports

Performance criterion A

Applicable for the test requirement defined in table clause 2.1

During the swept frequency test, the established connection shall be maintained throughout the testing and the information transferred without any additional reproducible errors or loss of synchronisation. If degradation in performance is observed and the system is adaptive, for example has the capability to automatically retrain in the presence of an interfering signal, then perform the following procedure:

a) For each range of interfering frequencies in which degradation in performance is observed, three frequencies (beginning, middle and end) shall be identified.

b) At each of the frequencies identified in step a), the interfering signal shall be applied and the system shall be allowed to retrain.

c) If the system is able to retrain and then functions correctly for a dwell time of at least 60 s without any additional reproducible errors or loss of synchronisation, then the performance level of the system is considered acceptable.

d) The frequencies identified in step a) and the data rates achieved in step b) shall be recorded in the test report.

Applicable for the test requirement defined in table clause 2.2

It is important that the modems are able to train in the presence of repetitive impulsive noise and minimize disruption to the end-user where a repetitive impulsive noise source starts after the link has synchronized.Therefore the following procedure and performance criteria shall apply.

The manufacturer shall select the class of impulsive noise protection (INP) to be used for the immunity test and should state this information in the technical documentation and in the test report. The maximum delay shall be set to 8 ms.

In the absence of impulsive noise: The modem shall operate without retraining at its target noise margin with a bit rate value depending on the line attenuation and the stationary noise being present on the line. (The actual value will be between the minimum and maximum bit rate values programmed in the port).

The impulsive noise source shall then be applied at the required test level.

With the impulsive noise applied: The modem shall operate without retraining and without SES at the bit rate established prior to the application of the impulsive noise. No extra CRC errors shall occur due to the impulsive noise.

Applicable for the test requirements defined in other subclauses

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

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

Performance criterion B

F.4.3.1 Applicable for the test requirement defined in table clause 2.3

Modems shall withstand the application of the isolated impulsive noise events. The performance criteria defined in Table F.3 shall be applied.

Table F.3 – Performance criteria against impulse duration

Impulse duration ms	**Performance criteria**
0,24	The application of the impulse shall not cause the xDSL link to lose synchronisation. No CRC errors are permitted.
10	The application of the 5 impulses shall result in less than 75 CRC errors and shall not cause the link to lose synchronisation.
300	The application of the impulse shall not cause the xDSL link to lose synchronisation.

Applicable for the test requirements defined in table clauses 2.5 and 4.5

For application of this test to the xDSL port, a repetition rate of 100 kHz (burst length 0,75 ms) shall be used.

For the application of this test to the AC mains power port, a repetition rate of 5 kHz shall be used.

Degradation of the performance as described in criterion A (defined in F.4.2.1) is permitted in that errors are acceptable during the application of the test. However the application of the test shall not cause the system to lose the established connection or re-train. At the cessation of the test, the system shall operate in the condition established prior to the application of the test without user intervention.

After the application of the EFT/B tests to the xDSL or AC mains power port, as defined in table clauses 2.5 and 4.5, the CRC error count shall not have increased by more than 600 when compared to the count prior to the application of the test.

Applicable for the test requirements defined in other subclauses

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance.

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

Performance criterion C

Degradation of the performance beyond that defined in criteria A and B is permitted provided that the normal operation of the EUT is self-recoverable to the condition established prior to application of the test or can be restored after the test by the operator.

8.8 Performance Criteria Description for Audio output function

Performance criterion A

General

During the test the audio output function shall be maintained and the requirements of G.7.1.2 or G.7.1.3 shall be met.

Devices supporting telephony functions

For devices that support telephony functions the limits of Table G.3 shall apply. With respect to Table G.3,

• the interference ratio (electrical or acoustic) shall meet the limits in column 3; or,

• the acoustic level of the demodulated audio shall be less than the limits in column 4; or,

• the digitally coded level of demodulated audio shall be less than limits in column 5; or,

• the analogue level of the demodulated audio shall be less than the limits in column 6.

Table G.3 – Performance criterion A – Limits for devices supporting telephony

Type of immunity test	Frequency range MHz	Acoustic or electrical interference ratio	Equivalent direct measurement		
			dB(SPL)	Digital dBm0	Analogue dBm
Conducted [a]	0,15 to 30	–20 dB	55	–50	–50
	30 to 80	–10 dB	65	–40	–40
Radiated	80 to 1 000	0 dB	75	–30	–30

[a] At the step in the frequency range, the lower limit shall be applied.

The equivalent direct measurement values are presented to show the equivalency of the interference ratio in comparison to a direct measured value. These values may be used if the direct measurement method of the test is used.

The values within this table are aligned with CISPR 24, noting that the test levels are different between this document and CISPR 24.

For terminals connected to digital wired network ports (such as Ethernet, ISDN), measurements of the demodulated 1 kHz may be performed on a remote AE, ideally of the same design.

NOTE The amplitude demodulation disturbances will arise, almost invariably, from semi-conductor junctions behaving as inadvertent square law detectors. This means that for a 10 dB increase in the applied test level, for example, from 1 V to 3 V, the demodulated line noise will increase by 20 dB. This 20dB offset was used to derive the values in Table G.3.

For all other devices

The measured acoustic interference ratio and/or the measured electrical interference ratio during the test shall be –20 dB or better.

Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance.

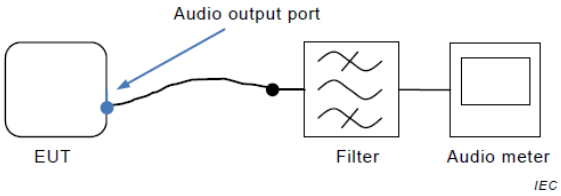
If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

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

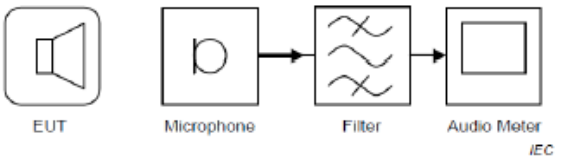
Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Test setup examples



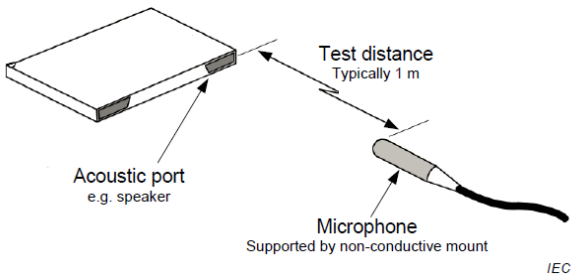
The filter is the audio filter specified in G.6.1 and is typically incorporated into the audio meter. Additional filtering might be necessary to ensure that the RF disturbance signal does not interfere with the measurement.

Figure G.1 – Example basic test setup for electrical measurements (direct connection to EUT)



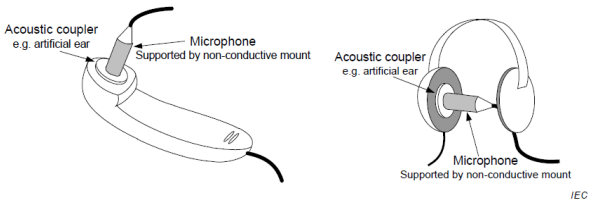
The filter is the audio filter specified in G.6.1 and is typically incorporated into the audio meter. Additional filtering might be necessary to ensure that the RF disturbance signal does not interfere with the measurement.

Figure G.2 – Example basic test setup for acoustic measurements



The microphone is connected via the cable to a suitable amplifier. Ensure that there is minimal acoustic loss between EUT and microphone.

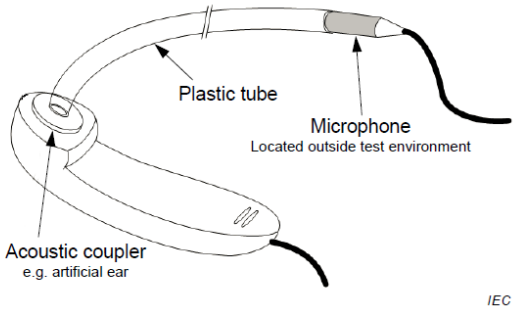
Figure G.3 – Example test setup for acoustic measurements on loudspeakers



NOTE 1 The microphone is connected via the cable to a suitable amplifier.

NOTE 2 This setup cannot be suitable for radiated testing. See G.6.3.

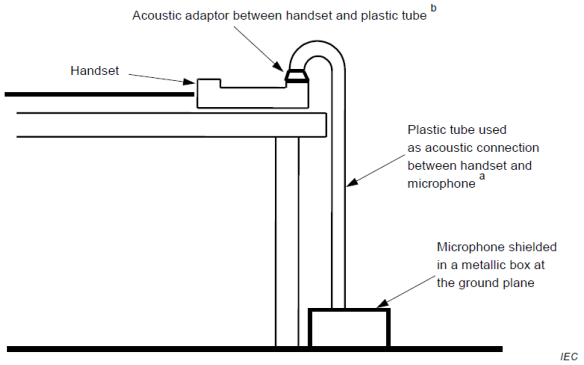
Figure G.4 – Example test setup for on-ear acoustic measurements



NOTE 1 The microphone is connected via the cable to a suitable amplifier.

NOTE 2 This setup is suitable for radiated immunity testing. See G.6.3

Figure G.5 – Example test setup for on-ear acoustic measurements, microphone located away from earpiece transducer

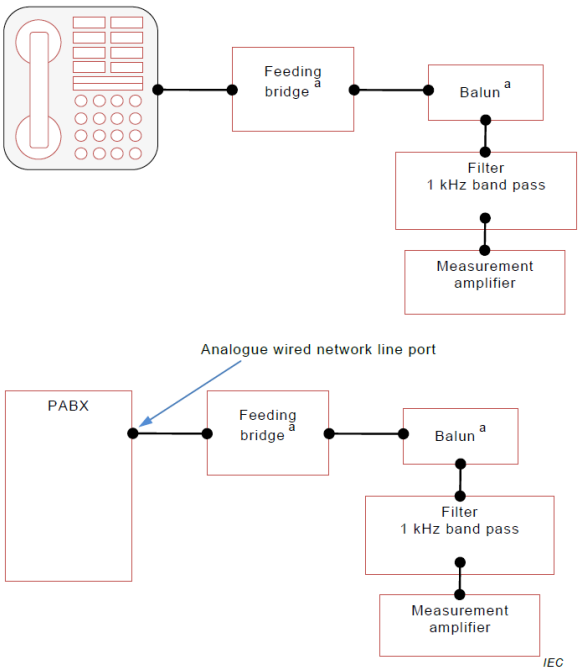


NOTE This set up is suitable for radiated immunity testing. See G.6.3.

[a] The acoustic measurement procedure compensates for the acoustic properties of the tube. Typically, the tube has an inner diameter of 15 mm, an outer diameter of 19 mm, and a total length of 1,5 m.

[b] Conically formed adaptor which is connected acoustically to the various forms of handsets with some type of soft rubber. This stable coupling of the handset to the acoustical tube should not be changed between establishing the reference level and measuring the demodulated levels.

Figure G.6 – Example test setup for measuring the sound pressure level from the acoustic output device of a telephone handset



[a] The feeding bridge current and the balun impedance are to be chosen according to the intended purpose of the EUT. In addition the feeding bridge may provide the power required for the MME to operate.

Figure G.7 – Example test setups for measuring the demodulation on analogue wired network lines

8.9 Performance Criteria Description for Telephony function

Table H.1 defines the performance criteria for various telephony functions that shall be exercised (or operated) in the presence of the disturbances specified in Table 1 to Table 4.

Table H.1 – Telephony functions, performance criteria

Function to be exercised	Performance criteria		
	A	**B**	**C**
Establish new communication	At the additional spot frequency tests a, c	Performed before and after the application of the test or disturbance	Performed before and after the application of the test or disturbance
Maintain established communication	Yes In addition, the requirements of Annex G for the audio output function shall be satisfied [c]	Yes [b]	No
Terminate established communication	At the additional spot frequency tests [a, c]	Performed before and after the application of the test or disturbance	Performed before and after the application of the test or disturbance

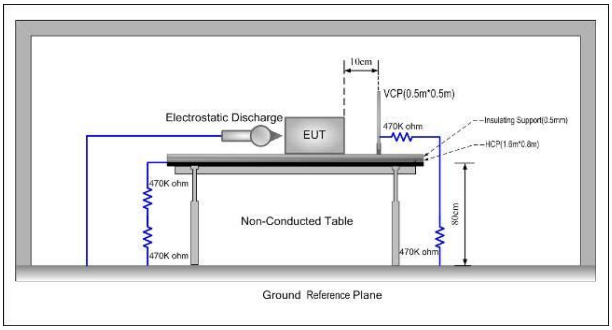
Communication refers to a telephone call or other form of voice connection.

[a] Applicable to TTE with a dial function that provides dedicated emergency service/safety of life call capability. Where the EUT does not provide this functionality, this limitation shall be stated in the equipment user manual.

[b] Communication shall be established prior to the application of the disturbance, the communication shall be maintained and the quality of that communication (for example, volume setting, the level of background noise) shall be maintained after completion of the test or disturbance.

[c] Where defined in Clause 5 (for the tests in Table 1 to Table 4), these functional tests shall be performed during the additional spot frequency tests.

8.10 Electrostatic Discharge

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

	0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.		
Test environment:	Temp.: 24 °C	Humid.: 51%	Press.: 1012mbar
Test mode:	Refer to section 6 for details		
Test Instruments:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Record:

Test points:	I: N/A
	II: Seams

Direct discharge

Discharge Voltage (KV)	Type of discharge	Test points	Observations (Performance Criterion)	Result
± 4	Contact	I	N/A	N/A
± 8	Air	II	A	Pass

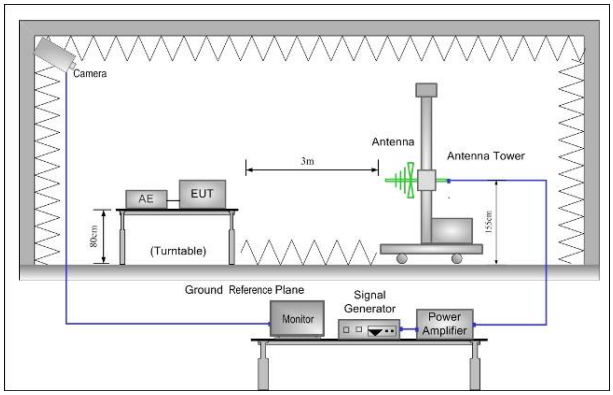
Indirect discharge

Discharge Voltage (KV)	Type of discharge	Test points	Observation Performance	Result
± 4	HCP-Bottom/Top/ Front/Back/Left/Right	Edge of the HCP	A	Pass
± 4	VCP-Front/Back /Left/Right	Center of the VCP	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.11 Radiated Immunity

Test Requirement:	EN 55035
Test Method:	EN 61000-4-3
Frequency range:	80MHz to 1GHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz
Test Level:	3V/m
Modulation:	80%, 1kHz Amplitude Modulation
Performance Criterion:	A
Test setup:	
Test Procedure:	1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Were the frequency range was swept incrementally, the step size was not exceed 1 % of the preceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s. 6. The test normally was performed with the generating antenna facing each side of the EUT. 7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. 8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to

	monitor the performance of the EUT.		
Test environment:	Temp.: 25°C	Humid.: 52%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Record:

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

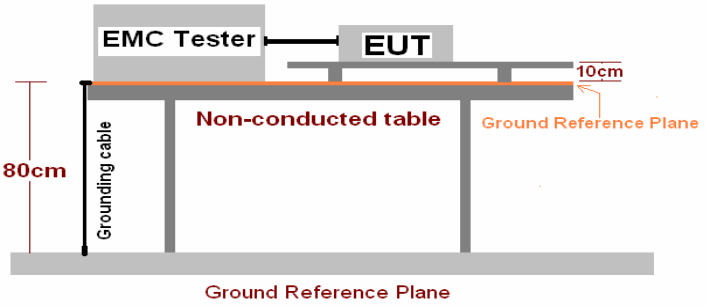
			H		A
2600MHz	3 V/m	1 kHz, 80 % Amp. Mod, 1% increment, dwell time=2seconds	V	Front	A
			H		A
			V	Rear	A
			H		A
			V	Left	A
			H		A
			V	Right	A
			H		A
			V	Top	A
			H		A
			V	Bottom	A
			H		A
3500MHz	3 V/m	1 kHz, 80 % Amp. Mod, 1% increment, dwell time=2seconds	V	Front	A
			H		A
			V	Rear	A
			H		A
			V	Left	A
			H		A
			V	Right	A
			H		A
			V	Top	A
			H		A
			V	Bottom	A
			H		A
5000MHz	3 V/m	1 kHz, 80 % Amp. Mod, 1% increment, dwell time=2seconds	V	Front	A
			H		A
			V	Rear	A
			H		A
			V	Left	A

			H		A
			V	Right	A
			H		A
			V	Top	A
			H		A
			V	Bottom	A
			H		A

Remarks:

A: No degradation in the performance of the E.U.T. was observed.

8.12 Electrical Fast Transients

Test Requirement:	EN 55035					
Test Method:	EN 61000-4-4					
Test Level:	1.0kV on AC port, 2.0kV on Earth, 0.5kV on Signal Lines					
Polarity:	Positive & Negative					
Repetition Frequency:	5kHz					
Burst Duration:	15ms					
Burst Period:	300ms					
Test Duration:	2 minute per level & polarity					
Performance Criterion:	B					
Test setup:						
Test Procedure:	The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables. Test on Signal Ports, Telecommunication Ports and Control Ports: The EUT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 2 minutes. Test on power supply ports: The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal. Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes. The length of the signal and power lines between the coupling device and the EUT is 0.5m					
Test environment:	Temp.:	26 °C	Humid.:	54%	Press.:	1 012mbar
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

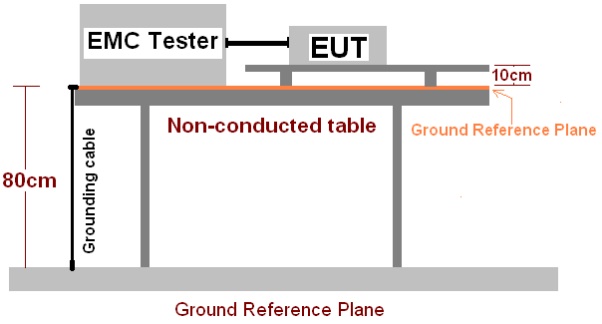
Measurement Record:

Lead under Test	Level (kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
L	± 1.0	Direct	A	Pass
N	± 1.0	Direct	A	Pass
L-N	± 1.0	Direct	A	Pass

Remark:

A: No degradation in the performance of the E.U.T. was observed.

8.13 Surges

Test Requirement:	EN 55035
Test Method:	EN 61000-4-5
Test Level:	1kV line to line: Differential mode 2kV line to earth: Common mode
Polarity:	Positive & Negative
Generator source impedance:	2Ω (line-line coupling) 12Ω (line-earth coupling)
Test signal specification:	Rise time=1.2us, Duration time=50us; Test Interval: 60s between each surge;
No. of surges:	5 positive, 5 negative at 90°, 270°.
Performance Criterion:	Criterion B
Test setup:	
Test Procedure:	1. For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground are same except test level is 2kV. 2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied 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 environment:	Temp.: 26 °C / Humid.: 53% / Press.: 1012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

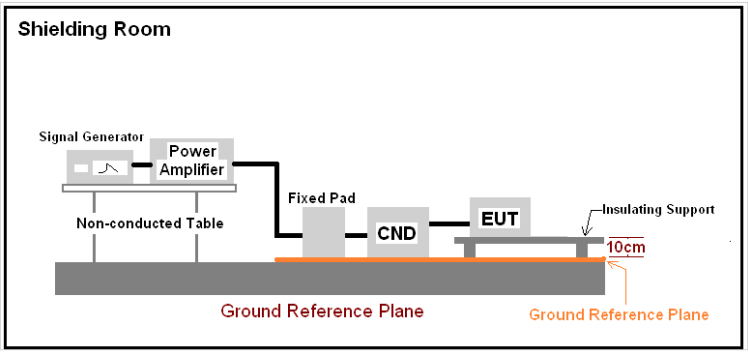
Measurement Record:

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)
L-N	± 1 kV	5	60s	90, 270	A

Remark:

A: No degradation in the performance of the E.U.T. was observed.

8.14 Conducted Immunity at Power Port (150kHz-80MHz)

Test Requirement:	EN 55035					
Test Method:	EN 61000-4-6					
Frequency range:	0.15MHz to 80MHz					
Modulation:	80%, 1kHz Amplitude Modulation					
Performance Criterion:	Criteria A					
Test setup:						
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 placedon the ground plane about 0.3m from EUT. Cables between CDN andEUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible). 3) The disturbance signal described below is injected to EUT through CDN. 4) The EUT operates within its operational mode(s) under intendedclimatic conditions after power on. 5) 5) The frequency range is swept from 0.150MHz to 80MHz using 3Vsignal level, and with the disturbance signal 80% amplitude modulatedwith a 1kHz sine wave. 6) 6) The rate of sweep shall notexceed 1.5*10-3decades/s. Where thefrequency is swept incrementally; thestep size shall not exceed 1% ofthe start and thereafter 1% of the preceding frequency value. 7) 7) Recording the EUT operating situation during compliance testing anddecide the EUT immunity criterion.					
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1 012mbar
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

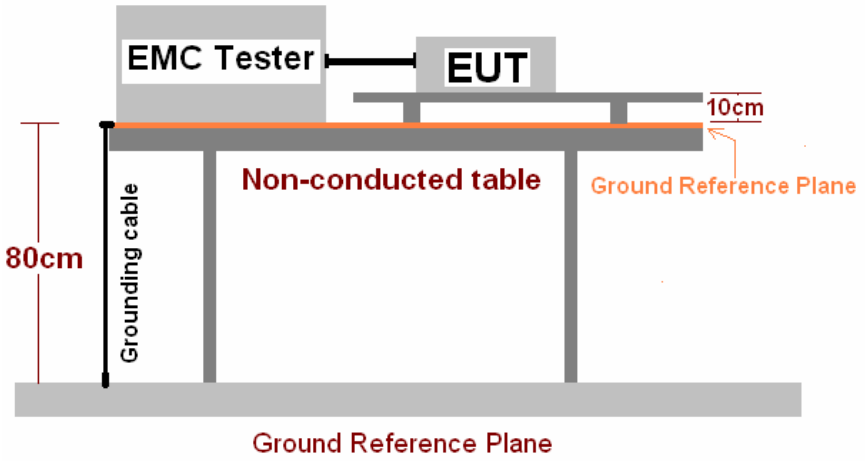
Measurement Record:

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result/Observations
AC power port	3(0.15MHz-10 MHz)	CDN	2s	A
AC power port	3 to 1(10MHz-30 MHz, Lines)	CDN	2s	A
AC power port	1(30MHz-80MHz)	CDN	2s	A

Remark:

A: No loss of function was observed.

8.15 Voltage Dips and Voltage Interruptions

Test Requirement:	EN 55035					
Test Method:	EN 61000-4-11					
Test Level:	<5% residual voltage for 0.5 periods: B 70% residual voltage for 25 periods: C <5% residual voltage for 250 periods: C					
No. of Dips /Interruptions:	3 per Level					
Performance Criterion:	100% VD ----Performance criterion: B					
	30% VD ----Performance criterion: C					
Test setup:						
Test Procedure:	1>.The EUT and test generator were setup as shown on above setup photo. 2>.The interruptions are introduced at selected phase angles with specified duration. 3>.Record any degradation of performance.					
Test environment:	Temp.:	26 °C	Humid.:	53%	Press.:	1 012mbar
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

Measurement Record:

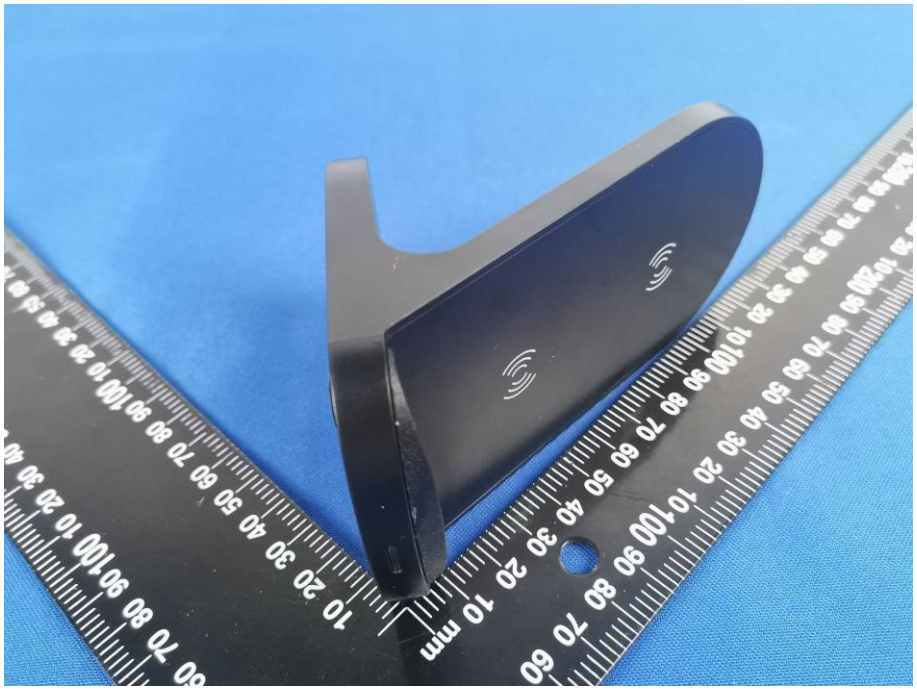
Test Level % U_T	Duration (Periods)	Phase angle	No of dropout	Time Between dropout	Observations (Performance Criterion)
0	0.5	0°, 90°, 180°, 270°	3	10s	A
70	25	0°, 90°, 180°, 270°	3	10s	A
0	250	0°, 90°, 180°, 270°	3	10s	B

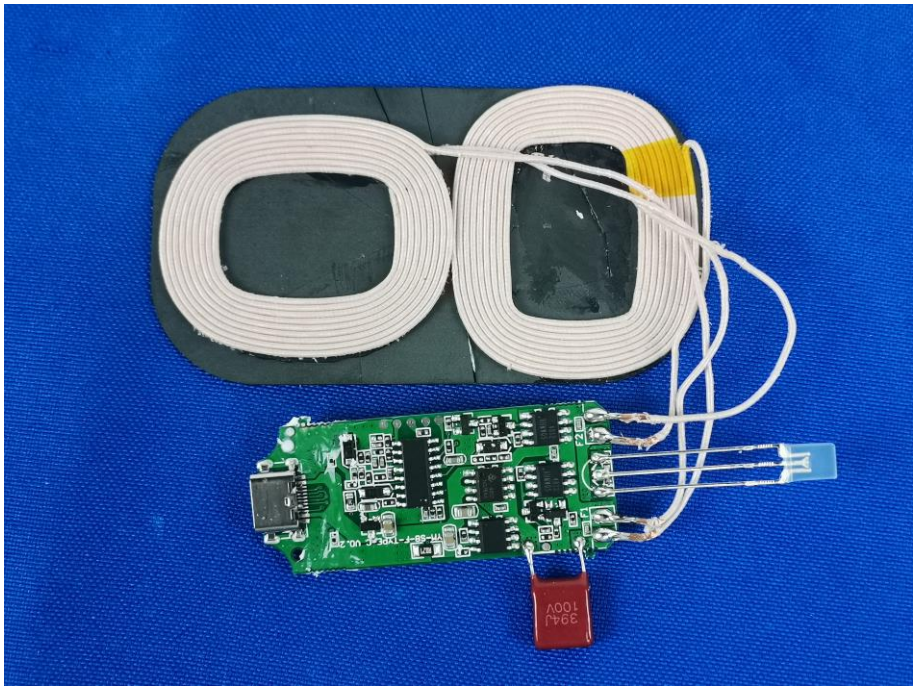
Remark:

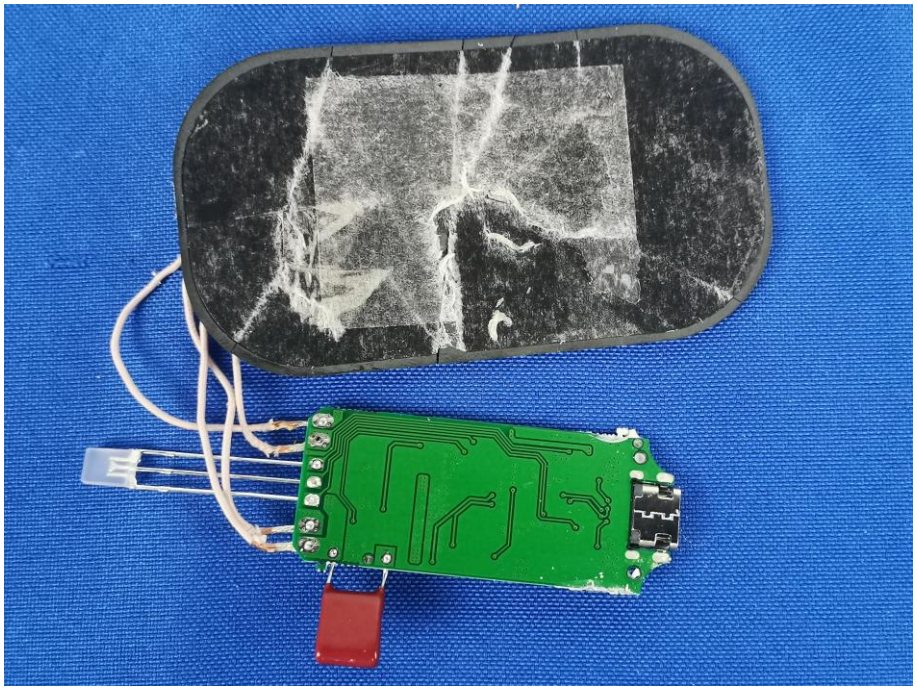
A: No loss of function was observed.

B: Dips to 0%, Duration 250P, EUT stopped operation, but it can be resumed by itself after test.

9 Photographs of the EUT







------End------