

EMC TEST REPORT

Equipment UV Sterilizer Bag
Trademark Henyway
Model No. XD-01
Report No. CTB200324016EX
Applicant SHENZHEN HENYWAY ELECTRONICS CO.,LTD
2/F East A3 Fenghuanggang 3rd Ind-par Baotian
1st Rd Xixiang Shenzhen China 518102
Manufacturer SHENZHEN HENYWAY ELECTRONICS CO.,LTD
2/F East A3 Fenghuanggang 3rd Ind-par Baotian
1st Rd Xixiang Shenzhen China 518102
Prepared by Shenzhen CTB Testing Technology Co., Ltd.
Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan
District, Shenzhen China
Tel: 086-4008-258-12
Fax: 086-0755-23208027
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Test Standard(s) EN 55015:2013+A1:2015, EN 61547:2009

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

Producer : Amy Yang , Date : Mar. 24, 2020
Amy Yang/Engineer
Signatory : Sherwin Qian , Date : Mar. 24, 2020
Sherwin Qian/Director

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.

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
0	Mar. 24, 2020	Initial Issue	All Page	Sherwin Qian

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1. TEST SUMMARY

EN 55015		
Clause	Requirement – Test case	Results
4.2	Insertion loss	N/A
4.3.1	Disturbance voltage at mains terminals ^{**}	N/A
4.3.2	Disturbance voltage at load terminals	N/A
4.3.3	Disturbance voltage at control terminals	N/A
4.4.1	Radiated electromagnetic disturbances (9 kHz to 30 MHz) ^{**}	Pass
4.4.2	Radiated electromagnetic disturbances (30 MHz to 300 MHz) ^{**}	Pass
Annex B	Independent method of measurement of radiated emission (CDNE)	N/A
EN 61547		
Clause	Requirement – Test case	Results
5.2	Electrostatic discharge	Pass
5.3	Radio-frequency electromagnetic fields	Pass
5.4	Power frequency magnetic fields	N/A
5.5	Fast transients	N/A
5.6	Injected currents (radio-frequency common mode)	N/A
5.7	Surges	N/A
5.8	Voltage dips and short interruptions	N/A
Supplementary information: --		

Remark: N/A is abbreviation for Not Applicable.

^{**} The test was carried out in all the test modes, only the worst data are list in report.

2. GENERAL INFORMATION

2.1. Description of EUT

Equipment	UV Sterilizer Bag
Trade Mark	Henryway
Model Name	XD-01
Serial No.	Not labeled
Model Difference	N/A
Normal Voltage	5V \pm 1A
Normal Testing Voltage	DC5V
Lamp technology used	<input type="checkbox"/> Fluorescent lamp <input type="checkbox"/> High pressure discharge lamp (HID) <input type="checkbox"/> Light emitting diode (LED/OLED) <input type="checkbox"/> Tungsten halogen lamp <input type="checkbox"/> Incandescent lamp <input type="checkbox"/> Others: UV Sterilizer Bag
Accessory Device	N/A

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.

Operating condition of EUT

Test mode	Description
1	ON
2	
3	
4	

2.2. Test conditions

Temperature: 15-25°C

Relative Humidity: 30-60 %

Atmospheric pressure: 800hPa-1060hPa

2.3. Block diagram of EUT configuration

3. FACILITIES

3.1. Test Facility

CTB-LAB

Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China

3.2. Test Instruments

Radiated Emission Measurement (Test software: EZ-EMC Ver. FA-03A2 RE)

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	2m Triple-Loop Antenna	Daze	ZN30401	17014	20201030
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	869	20201102
4	Amplifier	HP	8447E	2945A02747	20201101
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESPI7	100362	20201101

Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	ESD Simulator	TESTQ	NSG437	329	20201030

RF electromagnetic field Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	Agilent	N5182A	MY47420195	2020.10.30
2	Log-Bicon Antenna	Schwarzbeck	VULB9161	9128ES-128	2020.10.30
3	Power Amplifier	AR	150W1000M1	342526	2020.10.30
4	Microwave Horn Antenna	AR	AT4002A	322279	2020.10.30
5	Power Amplifier	AR	25S1G4A	321116	2020.10.30

4. Measurement uncertainty

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4.

Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	± 3.67 dB	± 5.2 dB
Radiated Emission	Level Accuracy: Above 1000MHz	± 4.79 dB	N/A

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5. Emission

5.1. Disturbance voltage

5.1.1. Limit

Disturbance voltage limits at mains terminals

Frequency range	Limits (dB μ V) ^a	
	Quasi-peak	Average
9KHz to 50KHz	110	--
50KHz to 150KHz	90 ~ 80 ^b	--
150KHz to 0.5MHz	66 ~ 56 ^b	56 ~ 46 ^b
0.5MHz to 5MHz	56 ^c	46 ^c
5.0MHz to 30MHz	60	50

^a At the transition frequency, the lower limit applies.

^b The limit decreases linearly with the logarithm of the frequency in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz.

^c For electrodeless lamps and luminaires, the limit in the frequency range of 2,51 MHz to 3,0 MHz is 73 dB(μ V)

Disturbance voltage limits at control terminals

Frequency range MHz	Limits (dB μ V) ^a	
	Quasi-peak	Average
0,15 to 0,5	80	70
0,5 to 30	74	64

^a At the transition frequency, the lower limit applies.

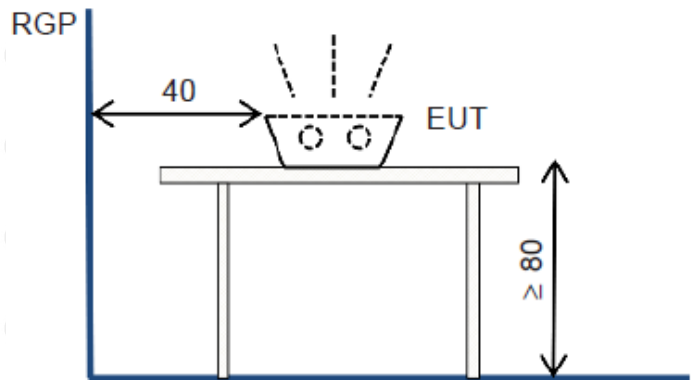
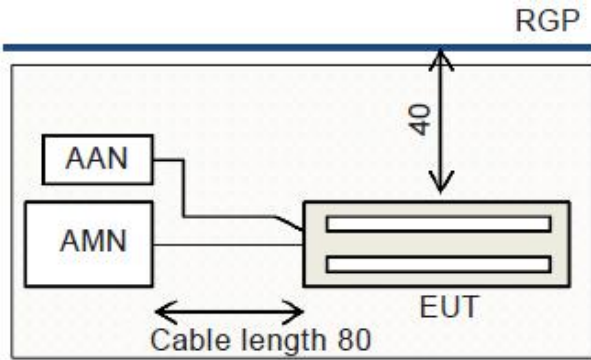
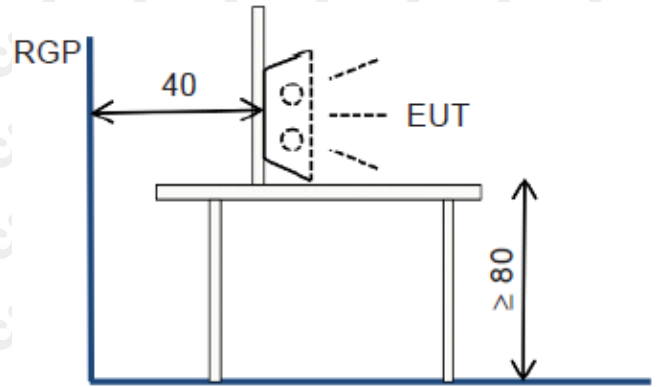
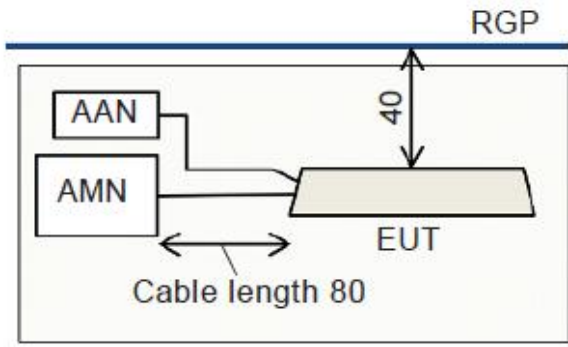
Disturbance voltage limits at control terminals

Frequency range MHz	Limits (dB μ V) ^a	
	Quasi-peak	Average
0,15 to 0,5	80 to 74	74 to 64
0,5 to 30	74	64

NOTE 1 The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz.

NOTE 2 The voltage disturbance limits are derived for use with an Asymmetric Artificial Network (AAN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the control terminal.

5.1.2. Block diagram of test setup



Top view

Side view (of EUT only)

5.1.3. Test procedure

Measurement was performed in shielded room, and instruments used were followed CISPR 16-2-1 clause 7.

Detailed test procedure was following clause 7 of CISPR 16-2-1.

Frequency range 9kHz to 30MHz was checked and EMI receiver measurement bandwidth was set to 200Hz (9 to 150kHz), 9kHz (150kHz to 30MHz).

5.1.4. Test results

N/A

5.2. Radiated electromagnetic disturbances (9KHz to 30MHz)

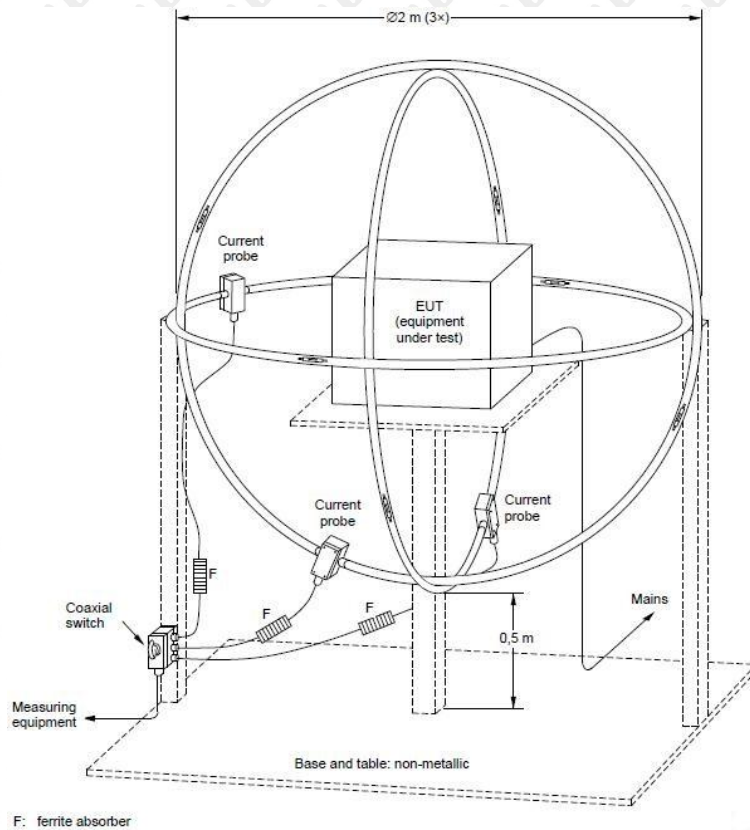
5.2.1. Limit

Radiated disturbance limits in the frequency range 9 kHz to 30 MHz

Frequency range MHz	Limits for loop diameter (dB μ A) ^a
	2m
9KHz to 70KHz	88
70KHz to 150KHz	88 ~ 58 ^b
150KHz to 3.0MHz	58 ~ 22 ^b
3.0MHz to 30MHz	22

^a At the transition frequency, the lower limit applies.
^b Decreasing linearly with the logarithm of the frequency. For electrodeless lamps and luminaires, the limit in the frequency range of 2,2MHz to 3,0MHz is 58dB(dB μ A) for 2m.

5.2.2. Block diagram of test setup



5.2.3. Test procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three axes of X Y Z are tested by coaxial switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter (R&S test receiver ESCI) is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz.

5.2.4. Test results

PASS

The peak value is too low against the limit, so the Test data is not record.

5.3. Radiated electromagnetic disturbances (30MHz to 300MHz)

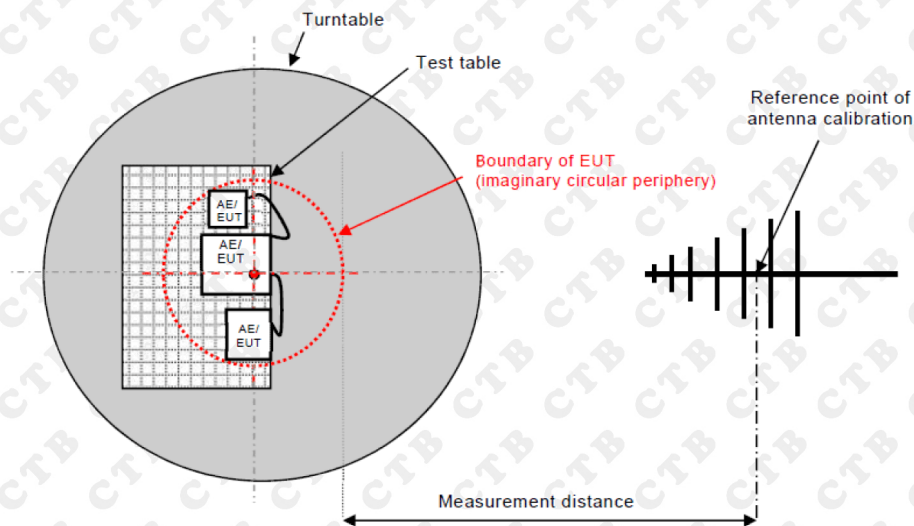
5.3.1. Limit

Frequency range MHz	Quai-peak limits (dB μ V/m) ^a
	3m ^{b, c}
30 to 230	40
230 to 300	47

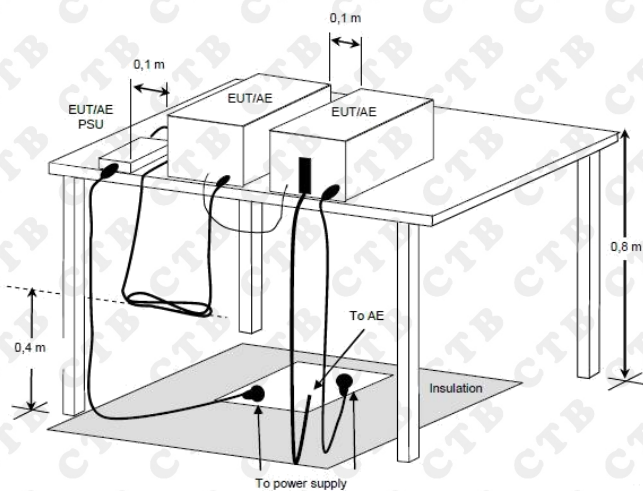
^a At the transition frequency, the lower limit applies.
^b Either of the two measurement distances and the associated limits can be applied to demonstrate compliance.
^c Care should be taken when measuring a large EUT at 3 m and at frequencies near 30 MHz due to near field effects

5.3.2. Block diagram of test setup

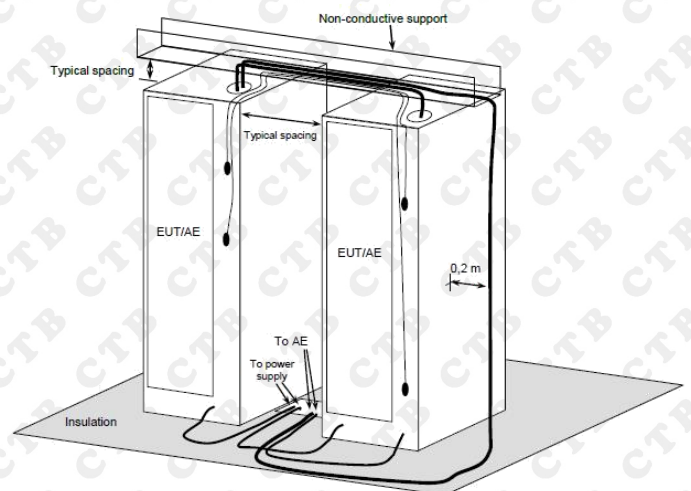
Measurement distance



For table-top equipment



For floor standing equipment



5.3.3. Test procedure

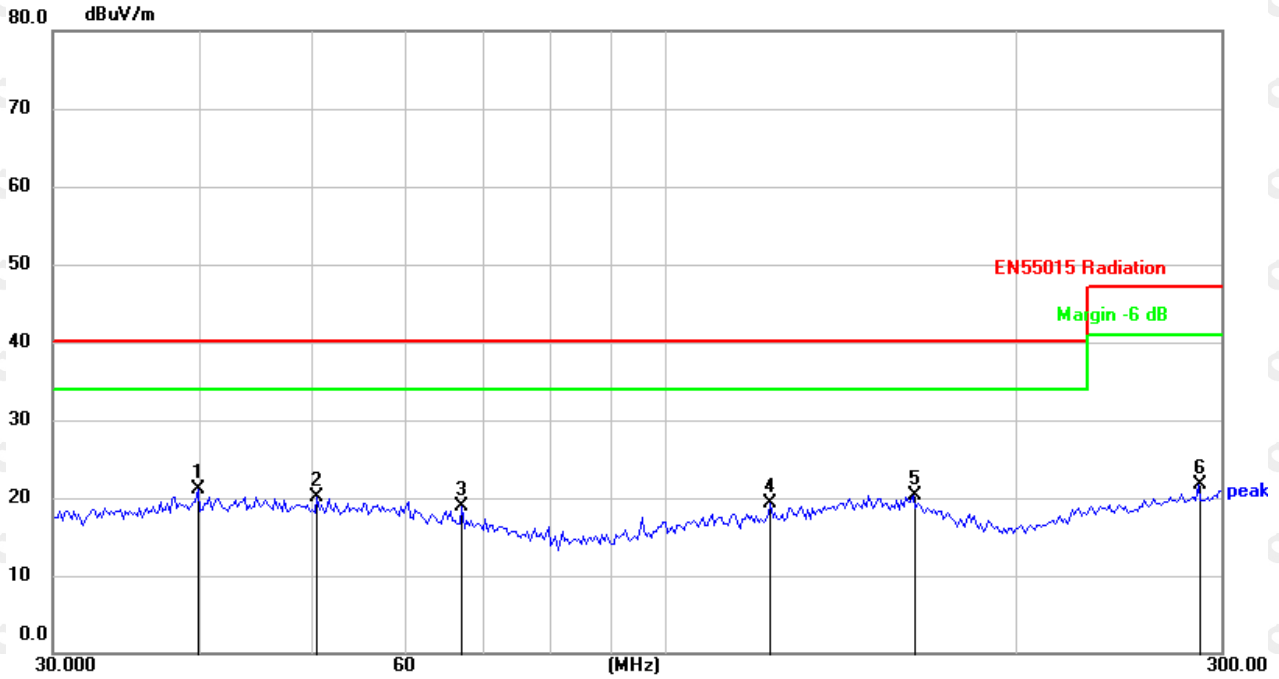
The measurement was performed in a semi-anechoic chamber.
The distance from EUT to receiving antenna is 3 meters.
Measurement was performed according to clause 7.3 of CISPR 16-2-3.

5.3.4. Test results

PASS

Please refer to the following page.

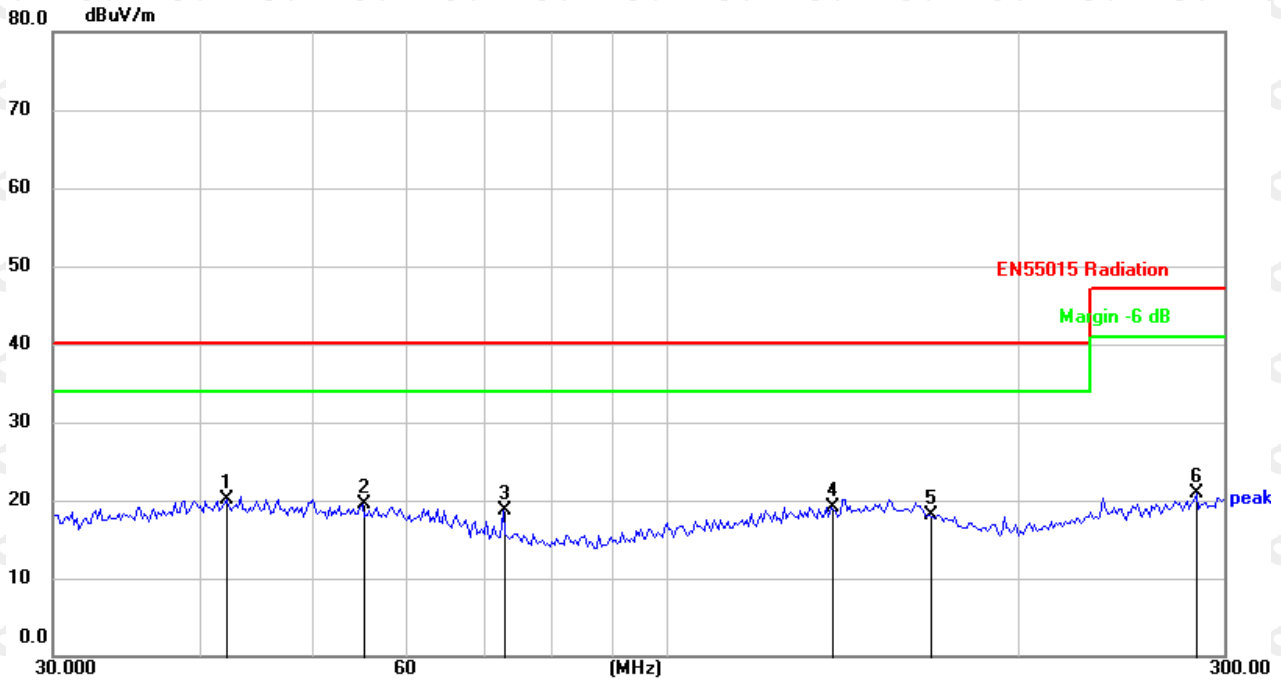
Polarization: H



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dB/m	Margin dB	Detector
1	*	39.9136	26.88	-5.79	21.09	40.00	-18.91	peak
2		50.4801	26.18	-6.14	20.04	40.00	-19.96	peak
3		67.1616	27.06	-8.15	18.91	40.00	-21.09	peak
4		123.3449	26.79	-7.54	19.25	40.00	-20.75	peak
5		163.3508	26.97	-6.59	20.38	40.00	-19.62	peak
6		286.4978	27.26	-5.48	21.78	47.00	-25.22	peak

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

Polarization: V



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dB/m	Margin dB	Detector
1	*	42.1814	25.98	-5.78	20.20	40.00	-19.80	peak
2		55.0962	25.85	-6.44	19.41	40.00	-20.59	peak
3		72.6309	27.82	-9.16	18.66	40.00	-21.34	peak
4		138.3953	25.73	-6.60	19.13	40.00	-20.87	peak
5		167.9273	25.15	-7.08	18.07	40.00	-21.93	peak
6		283.8711	26.40	-5.43	20.97	47.00	-26.03	peak

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

6. Immunity

Performance criteria

Performance criterion A

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 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

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena 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. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. 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 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. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

No.	Location of discharge	Polarity	Discharge	Number of discharges	Test level kV	Result
1	HCP top side	P&N	C	25	4	PASS
3	HCP bottom side	P&N	C	25	4	PASS
5	VCP right side	P&N	C	25	4	PASS
7	VCP left side	P&N	C	25	4	PASS
9	Points on conductive surface	P&N	C	25	4	PASS
10	Points on non-conductive surface	P&N	A	10	8	PASS

HCP = Horizontal coupling plate VCP = Vertical coupling plate N = Negative P = Positive
A = Air discharge C = Contact discharge

6.2. Radio-frequency electromagnetic field

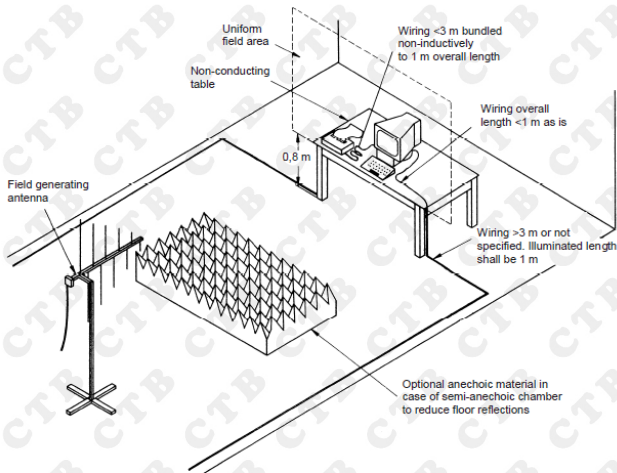
6.2.1. Test Levels and Performance Criterion

Characteristics	Test levels
Frequency range	80 MHz to 1 000 MHz
Test level	3 V/m (unmodulated)
Modulation	1 kHz, 80 % AM, sine wave

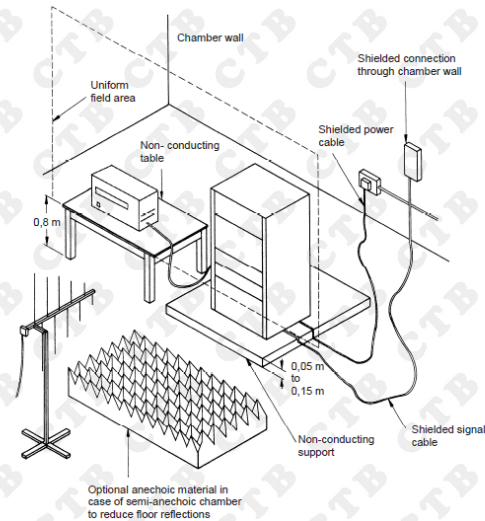
Performance criterion: **A**

6.2.2. Test setup

For table-top equipment



For floor standing equipment



6.2.3. Test Procedure

Measurement was performed in full-anechoic chamber.

Measurement procedure was applied according to EN 61000-4-3 clause 8.

The test method and equipment was specified by EN 61000-4-3.

6.2.4. Test Result

PASS

Enclosure	Horizontal	Vertical
Front	PASS	PASS
Right Side	PASS	PASS
Left Side	PASS	PASS
Rear	PASS	PASS

7. Photographs of EUT



End of report