

CE TEST REPORT

Product : **Transmission Device Middle Computer**
Trademark : N/A
Model/Type reference : NB8000
Report Number : K SZ2022103103E22
Date of Issue : Oct. 31, 2022
Test Standards : EN 61000-6-2:2019
EN 61000-6-4: 2019
EN 61000-3-3: 2013+A1:2019
EN 61000-3-2: 2019+A1:2-21
Test result : PASS

Prepared for:

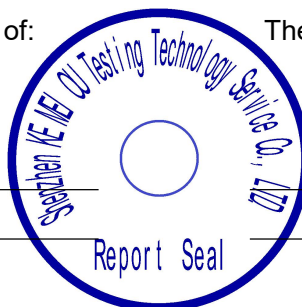
NB (Tianjin) Data Technology Co., Ltd.
Room 327-03, No.8, Xingliang Road, Daliang town, Wuqing District, Tianjin
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Prepared by:

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This test report is issued under the authority of:

The test was supervised by:



Apollo Liu/ Manager

Zoe Yang/ Test Engineer

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2 Version

Version No.	Date	Description
00	Oct. 19, 2022	Original

3 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	EN 61000-6-4	EN 61000-6-4	Class B	PASS
Conducted Emission (150kHz to 30MHz)	EN 61000-6-4	EN 61000-6-4	Class B	PASS
Harmonic Emission on DC, 50Hz	EN 61000-3-2	EN 61000-3-2	Class A	N/A
Voltage fluctuations&flicker	EN 61000-3-3: 2013	EN 61000-3-3: 2013	/	N/A
ESD/DC	EN 61000-4-2	EN 61000-4-2	Contact ± 4 kV Air $\pm 2,4,8$ kV	PASS
Radiated Immunity (80MHz to 1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz)	EN 61000-4-3	EN 61000-4-3	3V/m 80%, 1kHz, AM	PASS
Electrical Fast Transients (EFT) on AC & DC	EN 61000-4-4	EN 61000-4-4	AC ± 1.0 kV DC ± 0.5 kV	PASS
Surge Immunity on DC	EN 61000-4-5	EN 61000-4-5	± 1 kV ± 2 kV	PASS
Radio-frequency continuous conducted Immunity	EN 61000-4-6	EN 61000-4-6	1Vrms ,3Vrms (emf), 80%, 1kHz Amp. Mod.	PASS
Power-frequency magnetic fields Immunity	EN 61000-4-8	EN 61000-4-8	/	N/A
Voltage Dips and Interruptions on AC	EN 61000-4-11	EN 61000-3-3	0 % U_T for 0.5per 0 % U_T for 250per 70 % U_T for 25per	N/A

Remark:

The tested sample and the sample information are provided by the client.

§ If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. (Refer to EN 55032:2015 Clause 8 Conditional testing procedure)

§ If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. (Refer to EN 55032:2015 Clause 8 Conditional testing procedure)

§ If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. (Refer to EN 55032:2015 Clause 8 Conditional testing procedure)

§ If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less. (Refer to EN 55032:2015 Clause 8 Conditional testing procedure)

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5 General Information

5.1 Client Information

Applicant:	NB (Tianjin) Data Technology Co., Ltd..
Address of Applicant:	Room 327-03, No.8, Xingliang Road, Daliang town, Wuqing District, Tianjin (Central Office area), P. R. China
Manufacturer:	NB (Tianjin) Data Technology Co., Ltd..
Address of Manufacturer:	Room 327-03, No.8, Xingliang Road, Daliang town, Wuqing District, Tianjin (Central Office area), P. R. China

5.2 General Description of EUT

Product Name:	Transmission Device Middle Computer
Mode No.(EUT):	NB8000
Trademark:	N/A
Power Supply:	DC 24V

5.3 Other Information

EMC Directive:	2014/30/EU
Sample Received Date:	Oct. 19, 2022
Sample tested Date:	Oct. 19, 2022 to Oct. 31, 2022

5.4 Description of Support Units

The EUT has been tested with associated equipment below

Associated equipment name	Manufacture	model	S/N	Supplied by	Certification

5.5 Test Location

All tests were performed at:

Ke Mei Ou Laboratory

7A, Jiexiangge, Jiahuixincheng, No.3027, Shennan Rd., Futian, Shenzhen, Guangdong, P.R. China.

Zip Code: 518033

Tel: +86 755 83642690

Fax: + 86 755 83297077

5.6 Deviation from Standards

None.

5.7 Abnormalities from Standard Conditions

None.

5.8 Deviation from Standards

None.

5.9 Other Information Requested by the Customer

None.

5.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
2	Radiated emission	4.5dB (30MHz-1GHz)
		4.6dB (1GHz-6GHz)
3	Temperature test	0.64°C
4	Humidity test	2.8%
5	DC power test	0.025 %

6 Equipment List

Radiated Emission Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-04-2021	06-03-2023
TRILOG Broadband Antenna	SCHWARZBEC K	VULB9163	9163-401	06-05-2022	06-04-2023
Preamplifier	JS Tonscend	EMC051845SE	980380	01-19-2022	01-18-2023
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1869	04-25-2021	04-24-2023
Spectrum Analyzer	R&S	FSP40	100416	05-11-2022	05-10-2023
Receiver	R&S	ESCI	100435	05-25-2021	05-24-2023
Multi device Controller	matur0	NCD/070/10711 112	---	01-10-2022	01-09-2023

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	05-25-2022	05-24-2023
LISN	R&S	ENV216	100098	05-11-2022	05-10-2023

Flicker Test					
Equipment	Manufacturer	Model	Serial No.	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
5KVA AC POWER SOURCE	California instruments	5001iX-400-413	57344	03-09-2022	03-08-2023
Flicker & Harmonic Tester	California instruments	PACS-1	72492	02-06-2022	02-05-2023

ESD Test					
Equipment	Manufacturer	Model	Serial No.	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
ESD Simulator	TESEQ	NSG437	1182	08-25-2022	08-24-2023

EFT / Surges Test					
Equipment	Manufacturer	Model	Serial No.	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Compact Generator	EM-Test	UCS500M/6B	V0603101093	06-27-2022	06-26-2023

3M Full-anechoic Chamber - Radio-frequency electromagnetic field Immunity Test					
Equipment	Manufacturer	Model	Serial No.	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	06-19-2022	06-19-2023
ESG Vector signal generators	Agilent	E4438C	MY45095744	03-14-2022	03-13-2023
Power Amplifier	OPHIR RF	5225F	1037	02-17-2022	02-16-2023
Power Amplifier	OPHIR RF	5273F	1016	02-17-2022	02-16-2023
Power Amplifier	Rflight	NTWPAS-2560025	17043109	04-17-2022	04-16-2023
Horn Antenna	AR	ATH800M5GA	0342530	01-11-2022	01-10-2023
Stacked double Log.-Per. Antenna	schwarzbeck	STLP 9128 E special	9128ES-110	01-11-2022	01-10-2023
Power sensor	Boonto	51011A-EMC	36251	11-16-2022	11-15-2023

Radio-frequency continuous conducted Immunity Test					
Equipment	Manufacturer	Model	Serial No.	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Signal Generator	IFR	2023B	202307/439	11-16-2022	11-15-2023
Power Amplifier	AR	75A 250A	320297	01-23-2022	01-22-2023
Attenuator	EM-Test	ATT6/75	0320837	09-06-2022	09-05-2023
CDN	EM-Test	CDN M2/M3	0204-01	05-25-2022	05-24-2023

Voltage dips and interruptions Test					
Equipment	Manufacturer	Model	Serial No.	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
5KVA AC power source	California instruments	15003ix-CTS-400-413-EOS3-LF	1726A00002	03-09-2022	03-08-2023
Electronic output switch	California instruments	EOS3-230	1726A00001	03-09-2022	03-08-2023

7 Emission Test Results

7.1 Radiated Emissions

Test Requirement: EN 61000-6-4
Test Method: EN 61000-6-4
Measurement Distance: 3m
Ambient: Temp.: 26°C Humid.: 53% Press.: 1010mbar
Test mode: Printing mode
Receive Setup:

Frequency range (MHz)	Detector	RBW	VBW
30-1000	Quasi-peak	120kHz	300kHz
Above 1000	Peak	1MHz	3MHz

Limit:

Frequency	Limit(@3m)	Detector
30MHz-230MHz	40dBμV/m	QP
230MHz-1GHz	47dBμV/m	QP

Test Setup:

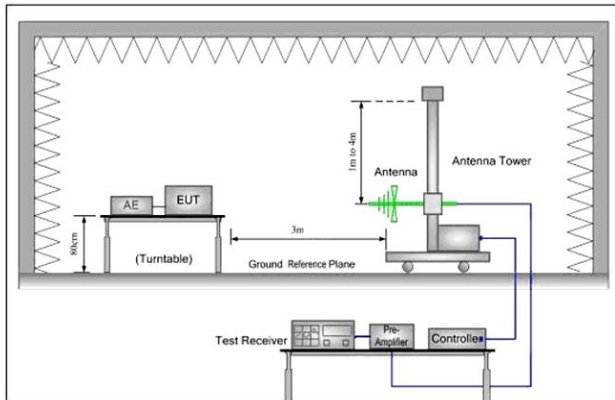


Figure 1. 30MHz to 1GHz

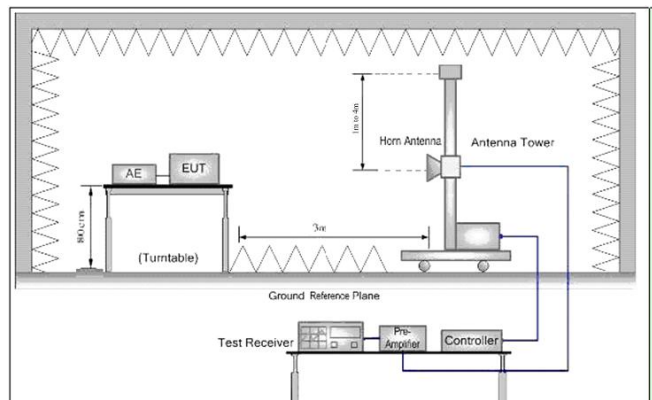


Figure 2. Above 1 GHz

Test Procedure:

- From 30 MHz to 1GHz test procedure as below:
 - The radiated emissions were tested in a semi-anechoic chamber.
 - The EUT is placed on a turntable, which is 0.8m above ground plane.
 - The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
 - EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
 - Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
 - And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
 - Repeat above procedures until the measurements for all frequencies are complete.
- Above 1GHz test procedure as below:
 - Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber

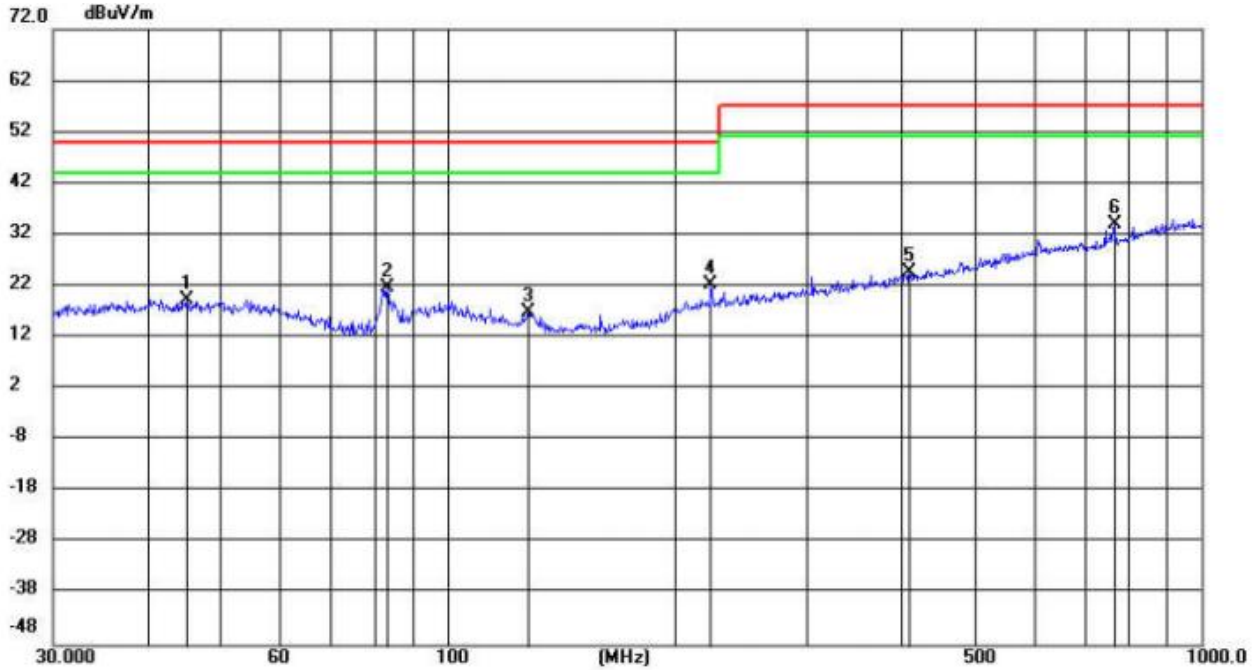
Equipment Used:

Refer to section 6 for details.

Test result:

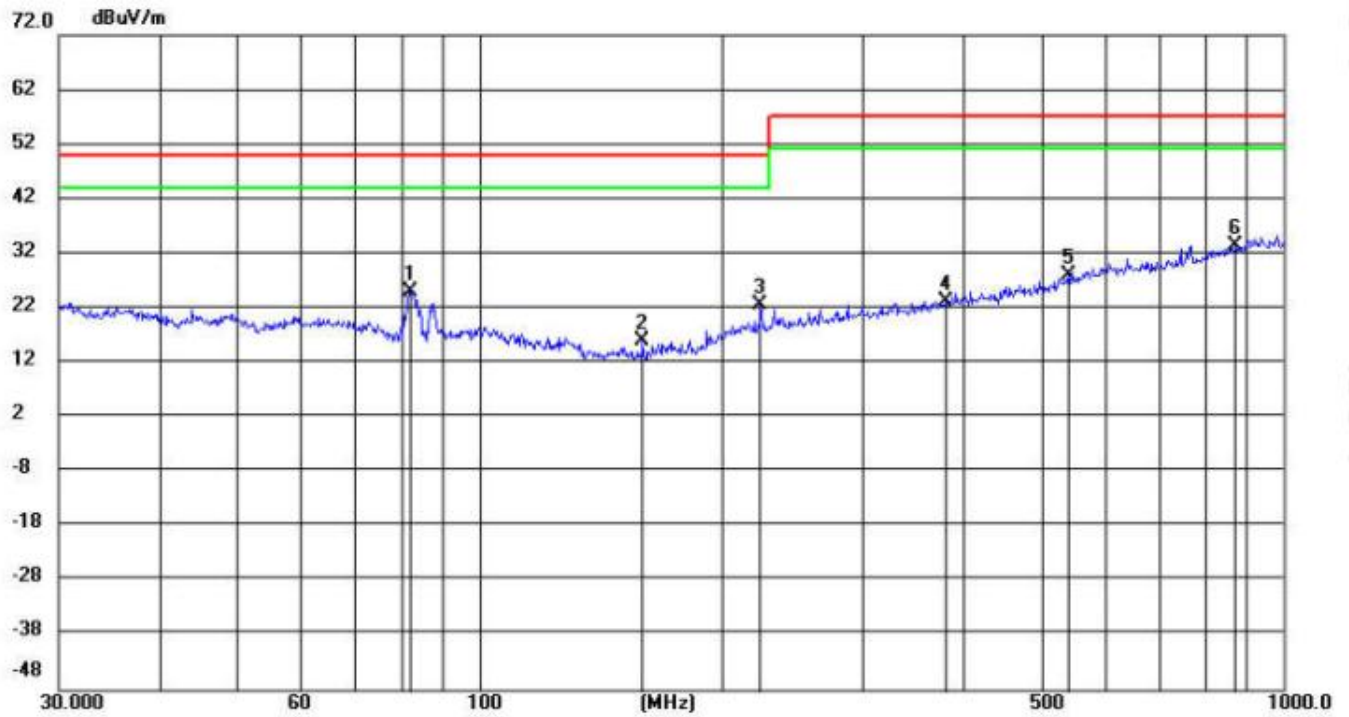
PASS

Measurement Data:
Below 1GHz
Horizontal



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree	Comment
1	45.0583	4.91	14.40	19.31	50.00	-30.69	QP	100	192	
2	83.2298	10.90	10.72	21.62	50.00	-28.38	QP	200	158	
3	128.1129	7.09	9.91	17.00	50.00	-33.00	QP	200	310	
4	223.7333	7.62	14.60	22.22	50.00	-27.78	QP	200	26	
5	410.3824	5.10	19.62	24.72	57.00	-32.28	QP	100	4	
6 *	766.0571	8.09	25.83	33.92	57.00	-23.08	QP	200	356	

Vertical



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measur- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	82.0705	14.72	10.40	25.12	50.00	-24.88	QP	100	341	
2	159.7844	6.28	9.83	16.11	50.00	-33.89	QP	100	356	
3	223.7333	8.06	14.60	22.66	50.00	-27.34	QP	200	281	
4	379.9141	4.35	18.96	23.31	57.00	-33.69	QP	100	138	
5	539.4775	5.50	22.52	28.02	57.00	-28.98	QP	100	18	
6 *	872.1832	5.51	27.86	33.37	57.00	-23.63	QP	100	199	

Remark:

1) The disturbance above 1GHz was very low, more than 20dB below the limit, so only the below 1GHz had been displayed.

7.2 Conducted Emission

1) For DC Main Port

Test Requirement: EN 61000-6-4

Test Method: EN 61000-6-4

Detector: Peak for pre-scan (9kHz Resolution Bandwidth)

Quasi-Peak if maximized peak within 6dB of Quasi-Peak limit

Ambient: Temp.: 23°C

Humid.: 50%

Press.: 1010mbar

Test mode: Printing mode

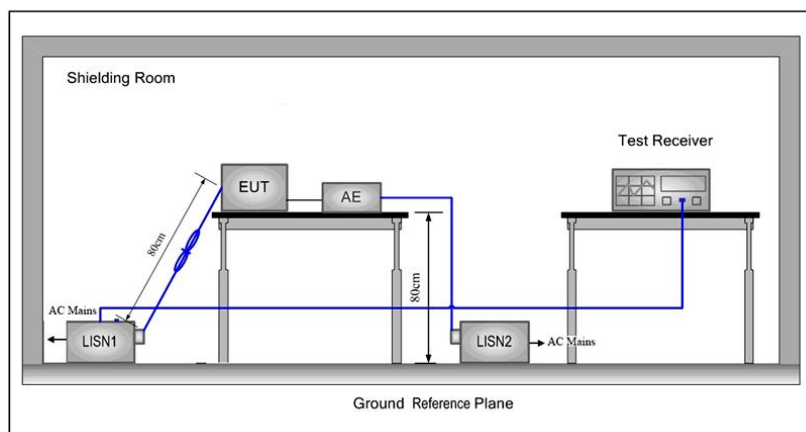
Equipment Used: Refer to section 6 for details.

Limit: Limits for conducted disturbance at the mains ports of class A

Frequency Range (MHz)	Class A Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

NOTE 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
NOTE 2: The lower limit is applicable at the transition frequency.

Test Setup:



Test Procedure:

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The EUT was placed upon a non-metallic table 0.8m above the ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

Test result:

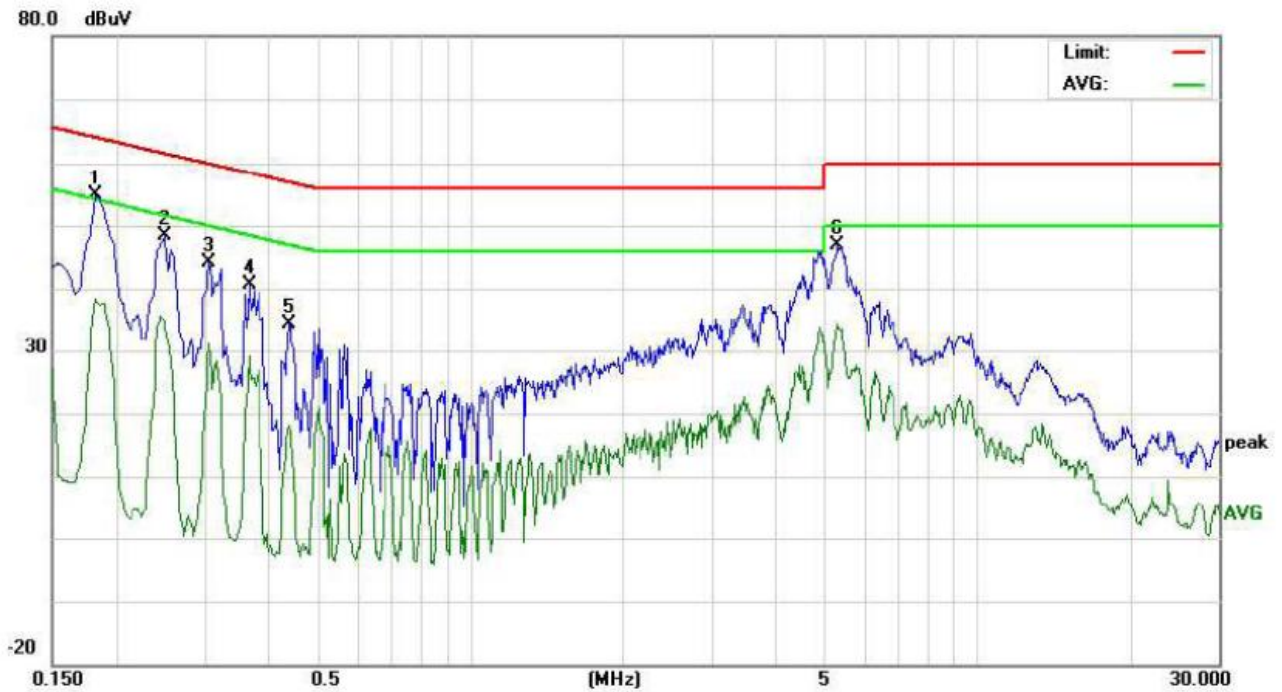
PASS

Measurement Data:

An initial pre-scan was performed on the live and neutral lines with peak detector.

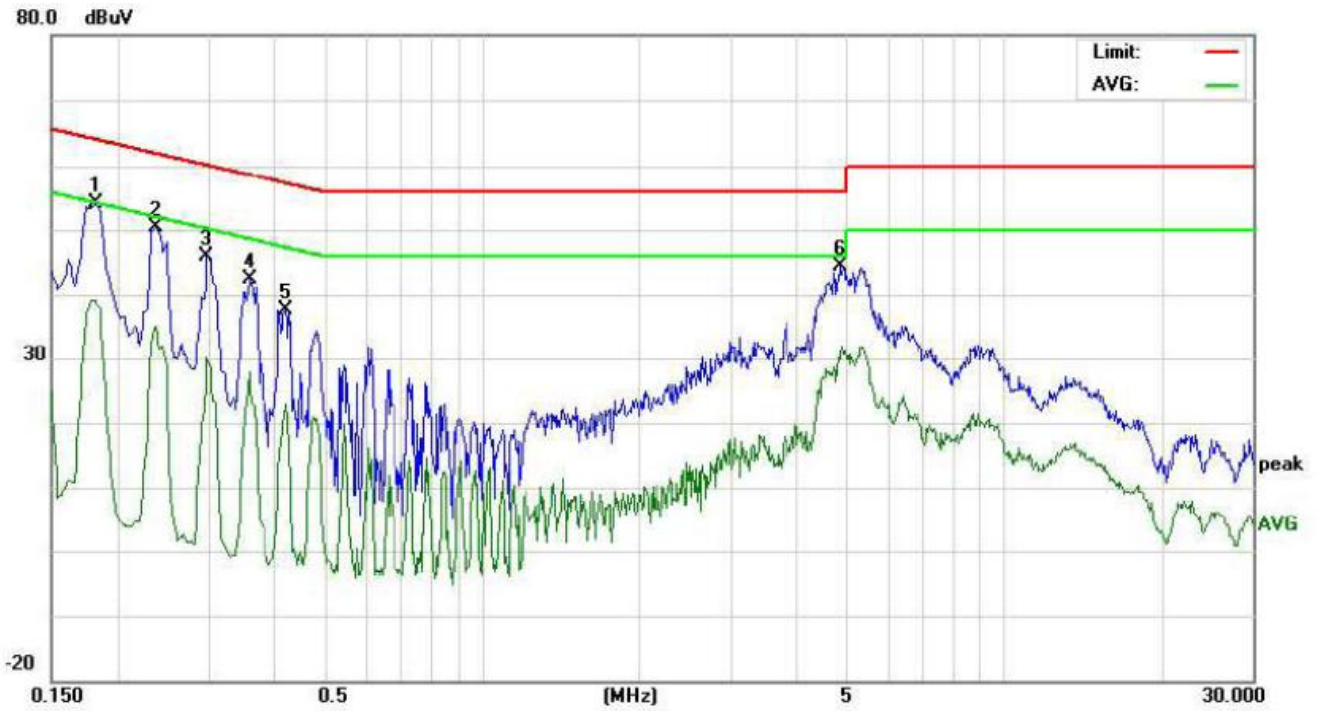
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1819	45.16	42.15	28.74	9.73	54.89	51.88	38.47	64.39	54.39	-12.51	-15.92	P	
2	0.2500	38.61	35.62	25.03	9.74	48.35	45.36	34.77	61.75	51.75	-16.39	-16.98	P	
3	0.3060	34.45	31.25	21.46	9.78	44.23	41.03	31.24	60.08	50.08	-19.05	-18.84	P	
4	0.3660	30.76	27.85	19.28	9.76	40.52	37.61	29.04	58.59	48.59	-20.98	-19.55	P	
5	0.4420	24.66	21.69	8.32	9.73	34.39	31.42	18.05	57.02	47.02	-25.60	-28.97	P	
6	5.3140	37.33	34.11	24.73	9.62	46.95	43.73	34.35	60.00	50.00	-16.27	-15.65	P	

Neutral Line:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1819	44.40	41.25	29.47	9.73	54.13	50.98	39.20	64.39	54.39	-13.41	-15.19	P	
2	0.2380	40.60	37.88	25.44	9.74	50.34	47.62	35.18	62.16	52.16	-14.54	-16.98	P	
3	0.2980	36.02	33.21	20.46	9.78	45.80	42.99	30.24	60.30	50.30	-17.31	-20.06	P	
4	0.3580	32.74	29.87	18.02	9.76	42.50	39.63	27.78	58.77	48.77	-19.14	-20.99	P	
5	0.4220	27.98	24.56	13.13	9.74	37.72	34.30	22.87	57.41	47.41	-23.11	-24.54	P	
6	4.8980	34.76	31.24	20.95	9.62	44.38	40.86	30.57	56.00	46.00	-15.14	-15.43	P	

8 Immunity Test Results

Performance Criteria Description in Clause 8 of 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.

8.1 Radiated Immunity

Test Requirement: EN 61000-4-3

EN 61000-4-3 EN 61000-4-3

Ambient: Temp.: 24°C

Humid.: 53%

Press.: 1010 mbar

Power: AC 230V 50Hz

Test Mode: Printing mode

Criterion Required: A

Equipment Used: Refer to section 6 for details.

Test Setup:

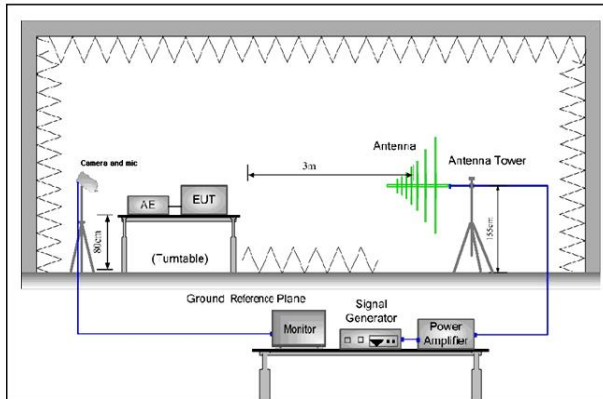


Figure 1. 80MHz to 1GHz

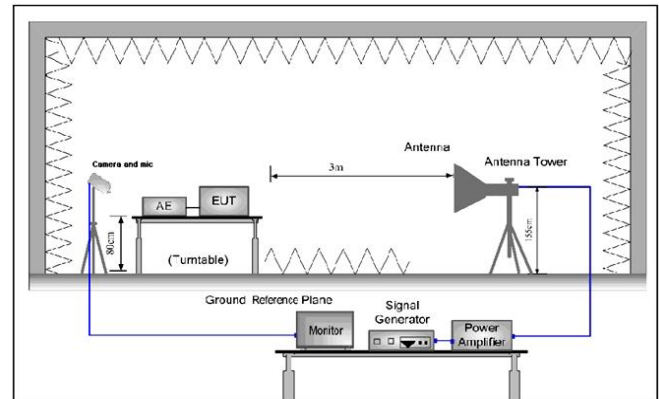


Figure 2. 1GHz to 6GHz

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. Where 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 an audio monitor were used to monitor the performance of the EUT.

Test result:

PASS

Test result:

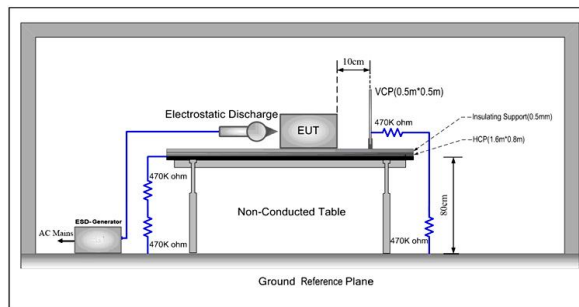
Frequency (MHz)	Level	Modulation	EUT Face	Antenna Polaxis	Result / Observations				
80 - 1000	3V/m	1kHz, 80% Amp. Mod, 1% increment Dwell time: 3 seconds	Front	V/H	A				
			Back	V/H	A				
			Left	V/H	A				
			Right	V/H	A				
1800		3V/m	1kHz, 80% Amp. Mod Dwell time: 3 seconds	Front	V/H	A			
				Back	V/H	A			
				Left	V/H	A			
				Right	V/H	A			
2600				3V/m	1kHz, 80% Amp. Mod Dwell time: 3 seconds	Front	V/H	A	
						Back	V/H	A	
						Left	V/H	A	
						Right	V/H	A	
3500			3V/m			1kHz, 80% Amp. Mod Dwell time: 3 seconds	Front	V/H	A
							Back	V/H	A
							Left	V/H	A
							Right	V/H	A
5000	3V/m				1kHz, 80% Amp. Mod Dwell time: 3 seconds		Front	V/H	A
							Back	V/H	A
							Left	V/H	A
							Right	V/H	A

Remarks:

A: No performance degradation during test.

8.2 ESD

Test Requirement:	EN 61000-4-2		
Test Method:	EN 61000-4-2		
Ambient:	Temp.:23 °C	Humid.:53 %	Press.: 1010mbar
Power:	AC 230V 50Hz		
Test Mode:	Printing mode		
Criterion Required:	B		
Discharge Impedance:	330 Ω / 150 pF		
Polarity:	Positive & Negative		
Number of Discharge:	Minimum 10 times at each test point		
Discharge Mode:	Single Discharge		
Discharge Period:	1 second minimum		
Equipment Used:	Refer to section 6 for details.		
Test Setup:			



Test set-up for tabletop equipment

Test Procedure:

- 1) Contact discharges to the conductive surfaces and to coupling planes:
The EUT was exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points (a minimum of 50 discharges at each point). One of the test points was subjected to at least 50 indirect discharges (contact) to the centre of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points were available, then at least 200 indirect discharges were applied in the indirect mode. Tests were performed at a maximum repetition rate of one discharge per second.

Air discharge at slots and apertures, and insulating surfaces:

On those parts of the EUT where it was not possible to perform contact discharge testing, the equipment was investigated to identify user accessible points where breakdown may occur. This investigation was restricted to those areas normally handled by the user. A minimum of 10 single air discharges were applied to the selected test point for each such area.

The application of electrostatic discharges to the contacts of open connectors was not required by this standard.

- 2) The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
- 3) A horizontal coupling plane (HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size & HCP were constructed from the same material type & thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surface excepted the GRP, HCP and VCP was greater than 1m.
- 4) During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.
- 5) After each discharge, the ESD generator was removed from the EUT, the

generator was then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

Test result: PASS

Test data:

- Observations: Test Point:
1. All insulated enclosure and seams.
 2. All accessible metal parts of the enclosure.

Dongle:

Direct Application Test Results				
Direct Application			Test Results	
Discharge Level (kV)	Pulse No.	Test Point	Contact Discharge	Air Discharge
± 8	10 for every level	1	N/A	A
± 4	10 for every level	2	A	N/A
Indirect Application for tabletop equipment Test Results				
Indirect Application			Test Results	
Discharge Level (kV)	Pulse No.		Horizontal Coupling	Vertical Coupling
± 4	10 for every level		A	A

Headset:

Indirect Application for tabletop equipment Test Results			
Indirect Application		Test Results	
Discharge Level (kV)	Pulse No.	Horizontal Coupling	Vertical Coupling
± 4	10 for every level	A	A

Remark:

A: No performance degradation during test.
 N/A: Not applicable.

8.3 RF Common Mode 0.15MHz to 80MHz

Test Requirement:	EN 61000-4-6		
Test Method:	EN 61000-4-6		
Test level:	1V rms , 3V rms		
Modulation:	80%, 1kHz Amplitude Modulation		
Test port :	AC port		
Criterion Required:	A		
EUT Operation:			
Ambient:	Temp.:23 °C	Humid.:53 %	Press.: 1010 mbar
Power:	AC 230V 50Hz		
Test Mode:	Printing mode		
Equipment Used:	Refer to section 6 for details.		
Test Setup:			

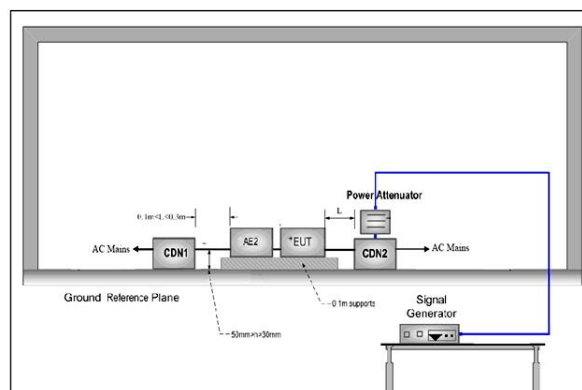


Figure 1. For AC port

- Test Procedure:**
- 1) The EUT was placed on an insulating support of 0.1m height above a ground reference Plane, arranged and connected to satisfy its functional requirement. All cables exiting the EUT was supported at a height of at least 30 mm above the ground reference plane.
 - 2) The coupling and decoupling devices were required, they were located between 0.1 m and 0.3 m from the EUT. This distance was to be measured horizontally from the projection of the EUT on to the ground reference plane to the coupling and decoupling device.
 - 3) Each AE, used with clamp injection, shall be placed on an insulating support 0.1 m above the ground reference plane. A decoupling network shall be installed on each cable between the EUT and AE except the cable under test. All cables connected to each AE, other than those being connected to the EUT, shall be provided with decoupling networks. The decoupling networks connected to each AE (except those on cables between the EUT and AE) shall be applied no further than 0.3 m from the AE. The cable(s) between the AE and the decoupling network (s) or in between the AE and the injection clamp shall not be bundled nor wrapped and shall be kept between 30 mm and 50 mm above the ground reference plane
 - 4) The frequency range was swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80 % amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or to change coupling devices as necessary. Where the frequency was swept incrementally, the step size does not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency was not less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s.

Test result: PASS

Test data:

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Observation (Performance Criterion)
150kHz to 10MHz	AC port	3Vrms	80%, 1kHz Amp. Mod.	1%	2 S	A
10MHz to 30MHz	AC port	3 to 1Vrms	80%, 1kHz Amp. Mod.	1%	2 S	A
30MHz to 80MHz	AC port	1Vrms	80%, 1kHz Amp. Mod.	1%	2 S	A

Remark:

A: No performance degradation during test.

8.4 Electrical Fast Transients (EFT)

Test Requirement:	EN 61000-4-4		
Test Method:	EN 61000-4-4		
Test Level:	± 1.0kV on DC port.		
Polarity:	Positive & Negative		
Repetition Frequency:	5kHz		
Burst Period:	300ms		
Test Duration:	2 minute per level & polarity		
Ambient:	Temp.:23 °C	Humid.: 53%	Press.: 1010mbar
Power:	AC 230V, 50Hz		
Test Mode:	Printing mode		
Equipment Used:	Refer to section 6 for details.		
Test Setup:			

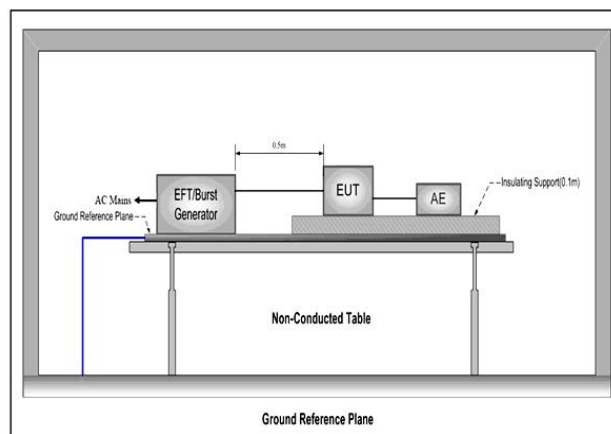


Figure 1. For AC port

Test Procedure:

- 1) The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
- 2) The GRP shall project beyond the EUT and the clamp by at least 0.1m on all sides. The distance between the EUT and any other of the metallic surface except the GRP was greater than 0.5m. All cables to the EUT were placed on the insulation support 0.1m above GRP. A cable not subject to EFT was routed as far as possible from cable under test to minimize the coupling between the cables.
- 3) The length of signal and power cable between the EUT and EFT generator was 0.5m. If the cable is a non-detachable supply cable more than 0.5m, the excess length of this cable shall be folded to avoid a flat coil and situated at a distance of 0.1m above the GRP.
- 4) The EUT was conducted the below specified test voltages for line and neutral or line, neutral and earth simultaneously (for telecommunication, single, control and DC port line with capacitive coupling clamp), 120 seconds duration. If the equipment contains identical ports, only one was tested; multicoupler cables, such as a 50-pair telecommunication cable, were tested as a single cable. Cables did not be split or divided into groups of conductors for this test; interface ports, which were intended by the manufacturer to be connected to data cables not longer than 3 m, did not be tested.

Test result: PASS

Test data:

Lead under Test	Level (kV)	Coupling Direct/Clamp	EUT operating mode	Observations (Performance Criterion)
L	± 0.5,1.0	Direct	Printing mode	A
N	± 0.5,1.0	Direct		A

Remark:

A: No performance degradation during test.

8.5 Surge

Test Requirement: EN 61000-4-5
Test Method: EN 61000-4-5
Test Level: For DC port
 1) 1kV Live to Neutral

Criterion Required: B

Polarity: Positive & Negative

Interval: 60s between each surge

No. of Surges: 5 positive, 5 negative at 90°, 270°.

Ambient: Temp.:23 °C

Humid.: 53%

Press.: 1010 mbar

Power: AC 230V 50Hz

Test Mode: Printing mode

Equipment Used: Refer to section 6 for details.

Test Setup:

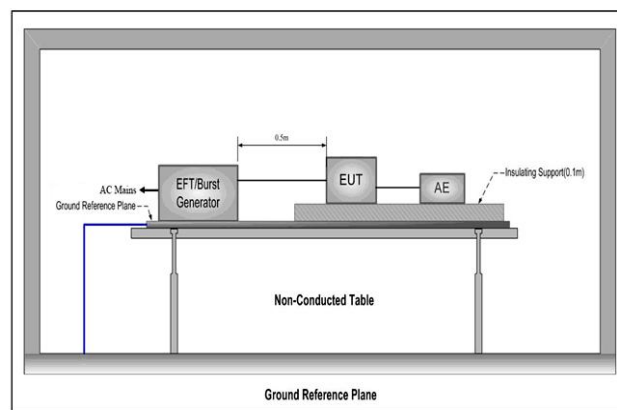


Figure 1. For AC port

- Test Procedure:**
- 1) The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for tabletop equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
 - 2) The 1.2/50 μ s surge was to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks were required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be applied on the lines under test.
 - 3) The power cord between the EUT and the coupling/decoupling network was not exceed 2 m in length. The interconnection line between the EUT and the coupling/decoupling network shall not exceed 2 m in length.
 - 4) The EUT was conducted 0.5 kV and 1 kV test voltage for line to line and line to neutral and conducted 0.5 kV, 1 kV and 2 kV test voltage for line to earth and neutral to earth, five positive pulses and five negative pulses each at 0°, 90°, 180° and 270° for a.c. power ports and five positive pulses and five negative surge pulses for d.c. power ports (for telecommunication port, It was 0.5 kV for indoor cable longer than 10m line to ground and 0.5kV, 1 kV test voltage for outdoor cable line to ground, five positive pulses and five negative surge pulses), The test levels were applied on the EUT with a 2 Ω generator source impedance for power supply terminals and 40 Ω output impedance for interconnection lines. The tests were done at repetition rate one per minute.

Test Results: PASS

Test Data:

For AC port (2 line)					
Pulse No	Line-Line	Level (kV)	Surge interval	phase (deg)	Observation (Performance Criterion)
1-5	L-N	+1	60s	90°	A
6-10	L-N	-1	60s	270°	A

8.6 Power-frequency magnetic fields Immunity

Test Requirement: EN 61000-4-8
Test Method: EN 61000-4-8
Test Level: For DC port
Criterion Required: A
No. of Surges: X axis Y axis Z axis 30A 30s
Ambient: Temp.:23 °C
Power: AC 230V 50Hz
Test Mode: Printing mode
Equipment Used: Refer to section 6 for details.
Test Setup:

mbar

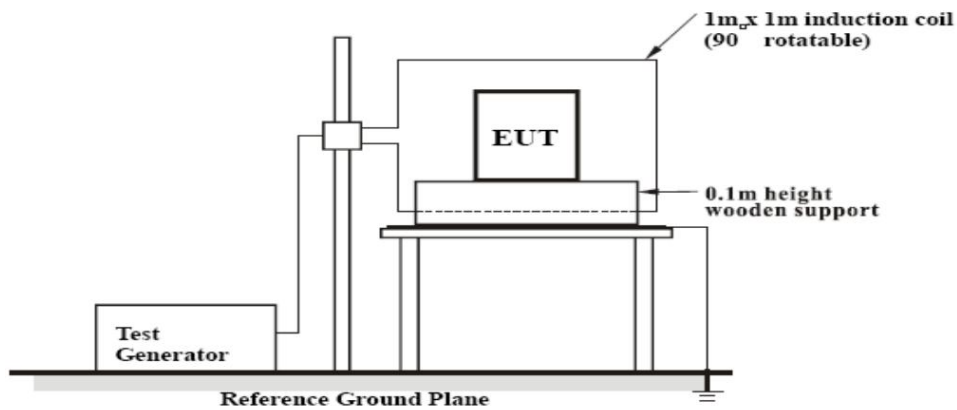


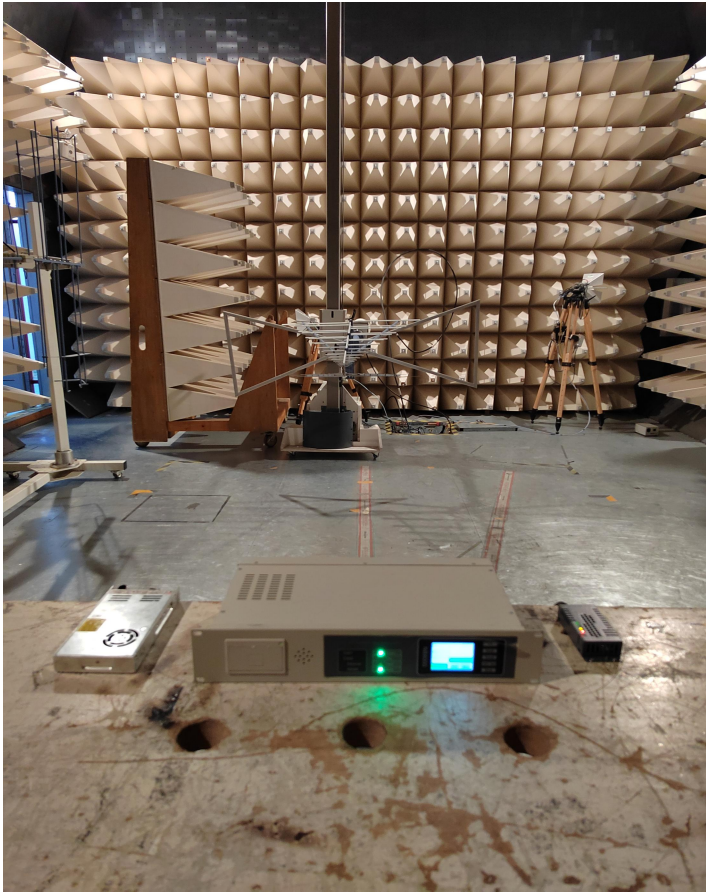
Figure 1. For DC port

- Test Procedure:**
- The Product and support units were located on a table, 0.8m away from ground floor.
 - The Product is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m thickness insulating support (e.g. dry wood)
 - Setting the parameter of tests and then perform the test software of test simulator.
 - The induction coil shall enclose the Product placed at its centre.

Test Results: PASS

Direction	Field Strength (A/m)	Duration (S)	Required Level	Performance criteria
X axis	30	30	A	A
Y axis	30	30	A	A
Z axis	30	30	A	A

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

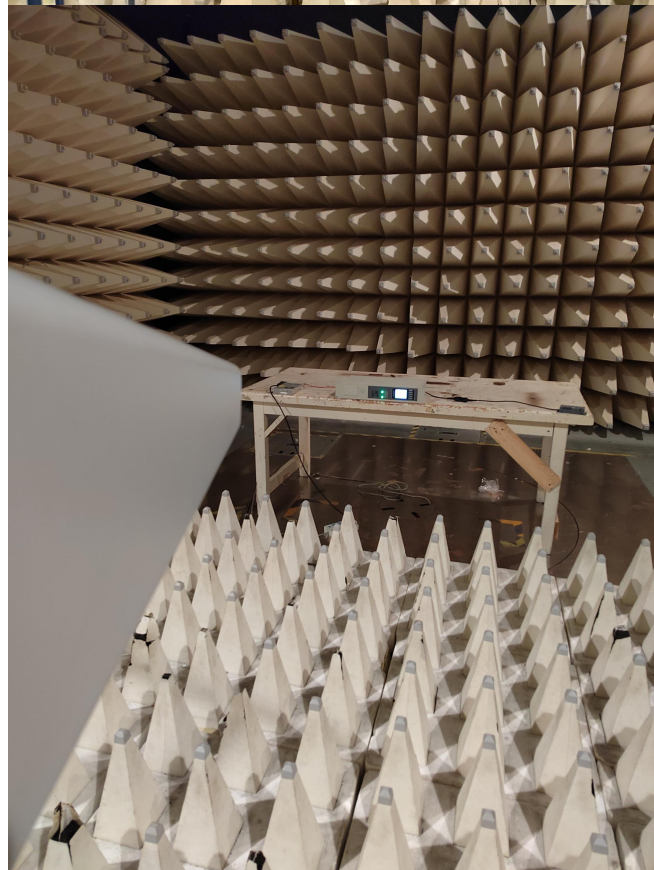
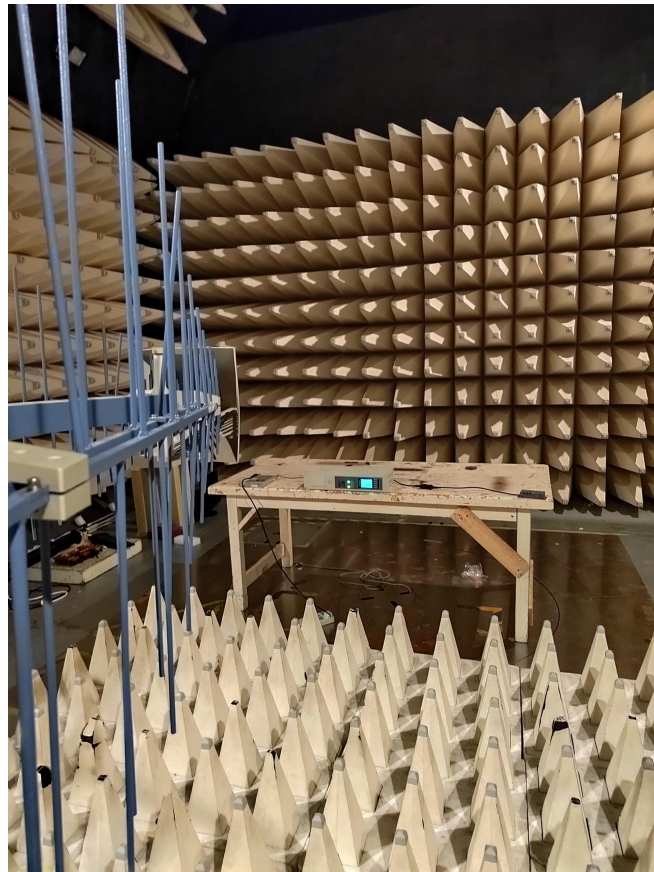


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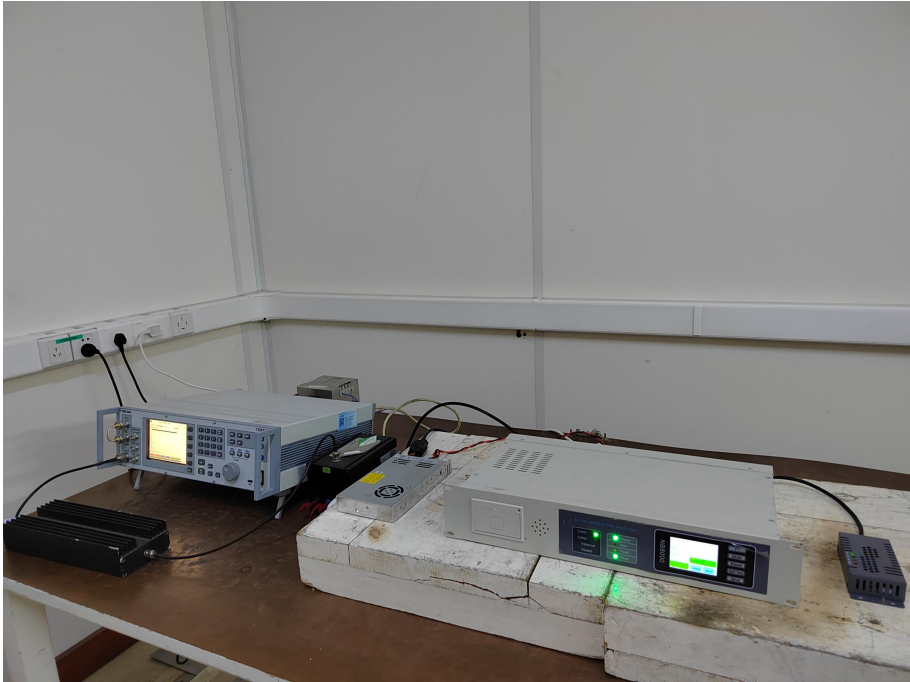


CE

Remark:



RS



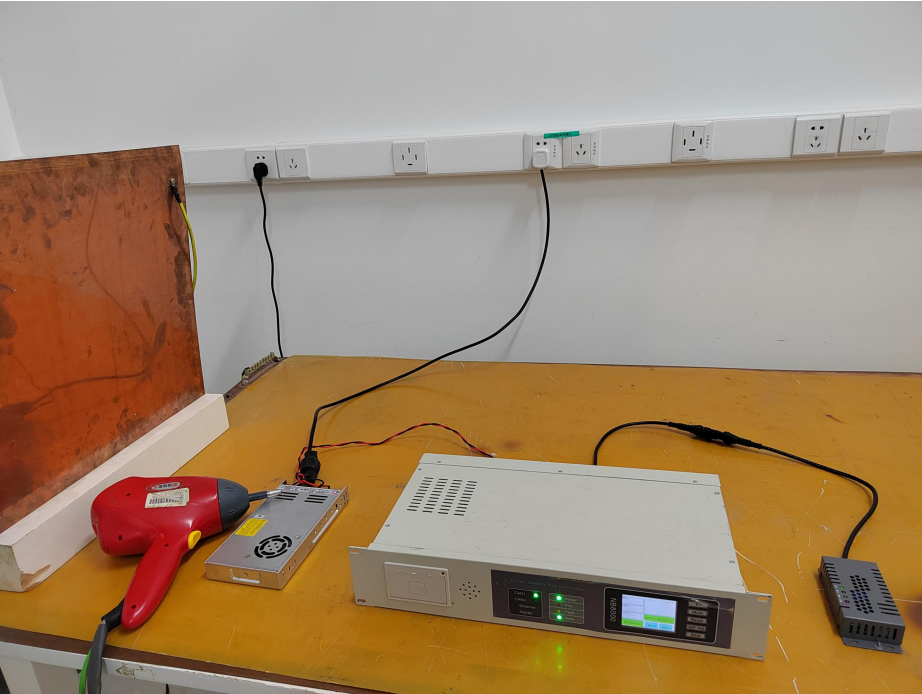
CS



Surge



EFT



ESD



Power-frequency magnetic fields Immunity

APPENDIX PHOTOGRAPHS OF EUT

View of EUT-1



*** End of Report ***

CERTIFICATE



No. 6H221104.NBCT81

Test Report / Technical Construction File no. KSZ2022103103E22

Certificate's Holder: NB (Tianjin) Data Technology Co., Ltd.
Room 327-03, No.8, Xingliang Road, Daliang Town,
Wuqing District, Tianjin (Central Office area), P. R. China

Certification
ECM Mark



Product: Transmission Device Middle Computer
Model(s): NB8000

Verification to: Standard:
EN 61000-6-2:2019, EN 61000-6-4:2019,
EN 61000-3-3:2013+A1:2019,
EN 61000-3-2: 2019+A1:2021
related to CE Directive(s):
2014/30/EU (Electromagnetic Compatibility)

This document has been issued in accordance with the European Commission's note of 14 September 2022 ref. Ares (2022) 6342894 concerning voluntary certifications with a non-notified procedure.

The manufacturer has voluntarily decided to submit its documents concerning the above-mentioned product for verification. Ente Certificazione Macchine confirms that the documentation made available and immediately returned to it, as containing sensitive data, meets the essential requirements of the above-mentioned directives. The verification activity carried out exclusively concerned the technical documentation and no verification was carried out on the product. This document cannot replace the EC Declaration of Conformity. The above conformity mark can be affixed to the technical documentation in accordance with the ECM regulation on its issue and use, published on the website www.entecerma.it

Issuance date: 04 November 2022

Expiry date: 03 November 2027

For online check:



Approver
Ente Certificazione Macchine
Legal Representative
Luca Bedonni

