

# TEST REPORT

**Application No.:** SHEM2104002922BA  
**Applicant:** Zhejiang Narada Power Source Co., Ltd.  
**Address of Applicant:** No.72 Jingguan Road, Qingshanhu Subdistrict, Lin'An, Hangzhou, Zhejiang  
**Manufacturer:** Zhejiang Narada Power Source Co., Ltd.  
**Address of Manufacturer:** No.72 Jingguan Road, Qingshanhu Subdistrict, Lin'An, Hangzhou, Zhejiang  
**Factory:** Hangzhou Narada Motive Power Science &Technology Co.,Ltd.  
**Address of Factory:** No. 120 Hongda Road, Yuhang Economic Development Zone , Yuhang District, Hangzhou, Zhejiang, China

**Equipment Under Test (EUT):**  
**EUT Name:** Lithium-ion Battery  
**Model No.:** 48NPFC200, 48NPFC10, 48 NPFC20, 48NPFC50, 48NPFC80, 48NPFC100, 48 NPFC150, 48NPFC160 □  
 □ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

**Trade mark:** Narada  
**Standard(s) :** EN 61000-6-3:2007 +A1:2011  
 EN IEC 61000-6-1:2019

**Date of Receipt:** 2021-04-06  
**Date of Test:** 2021-04-15 to 2021-04-27  
**Date of Issue:** 2021-04-29

<b>Test Result:</b>	<b>Pass*</b>
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\* 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.

Parlan Zhan

Parlan Zhan  
E&E Section Manager





The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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Revision Record			
Version	Description	Date	Remark
00	Original	2021-04-29	/

<b>Authorized for issue by:</b>			
			
		<hr/>	
		<b>Andy Yang / Project Engineer</b>	
			
		<hr/>	
		<b>Bruce Tang /Reviewer</b>	



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## 2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	EN 61000-6-3:2007 +A1:2011	CISPR 16-2-1	N/A	Pass
Radiated Emissions (30MHz-1GHz)	EN 61000-6-3:2007 +A1:2011	CISPR 16-2-3	N/A	Pass
Radiated Emissions (above 1GHz)	EN 61000-6-3:2007 +A1:2011	CISPR 16-2-3	N/A	Pass
Harmonic Current Emission	EN 61000-6-3:2007 +A1:2011	EN IEC 61000-3-2:2019	Class A	Pass
Voltage Fluctuations and Flicker	EN 61000-6-3:2007 +A1:2011	EN 61000-3-3:2013+A1:2019	Clause 5 of EN 61000-3-3	Pass

N/A: Not applicable

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN IEC 61000-6-1:2019	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Electrical Fast Transients/Burst at Power Port	EN IEC 61000-6-1:2019	EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5 or 100kHz Repetition Frequency	Pass
Electrical Fast Transients/Burst at Signal Port	EN IEC 61000-6-1:2019	EN 61000-4-4:2012	0.5kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Surge at Power Port	EN IEC 61000-6-1:2019	EN 61000-4-5:2014 +A1:2017	1.2/50µs Tr/Td 1kV Line to Line 2kV Line to Ground	Pass
Conducted Immunity at Power Port (150kHz-80MHz)	EN IEC 61000-6-1:2019	EN 61000-4-6:2014	3Vrms (emf),80%,1kHz Amp. Mod.	Pass
Conducted Immunity at Signal Port (150kHz-80MHz)	EN IEC 61000-6-1:2019	EN 61000-4-6:2014	3Vrms (emf),80%,1kHz Amp. Mod.	Pass



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Immunity Part				
Item	Standard	Method	Requirement	Result
Voltage Dips and Interruptions	EN IEC 61000-6-1:2019	EN 61000-4-11:2004 +A1:2017	0 % UT for 0.5per 0 % UT for 1per 70 % UT for 25per 0 % UT for 250per UT is Supply Voltage	Pass
Radiated Immunity (80MHz-6GHz)	EN IEC 61000-6-1:2019	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod. 3V/m, 80%, 1kHz Amp. Mod.	Pass

N/A: Not applicable

**Declaration of EUT Family Grouping:**

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model 48NPFC200 was tested since their differences were the model number and appearance.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply: DC 48V 200Ah

Test voltage: AC 230V 50Hz

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC power supply	HP	HP6674A	-
Laptop	LENOVO	R400	/
Load Resistor	/	/	/

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission at mains port using AMN	2.6dB (9kHz to 150kHz)
		2.4dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	1.8 dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	4.2 dB (150kHz to 30MHz)
4	Radiated Power	3.2dB
5	Radiated Emission	4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
6	Radiated Disturbance (disturbance current in a LLAS)	2.4dB (9kHz to 30MHz)

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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#### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (LAB CODE: 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

- **FCC (Designation Number: CN5033)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None

#### 4.8 Monitoring of EUT for All Immunity Test

Visual: monitor the work status and voltage or current



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## 5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2020-12-20	2021-12-19
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2020-12-20	2021-12-19
Line impedance stabilization network	EMCO	3816/2	SHEM019-1	2020-12-20	2021-12-19
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2020-12-20	2021-12-19
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2020-12-20	2023-12-19
CE test Cable	/	/	CE01	2020-12-20	2021-12-19

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2020-12-20	2021-12-19
CONTROLLER	INNCO	CO200	SHEM047-1	N/A	N/A
ANTENNA MAST	INNCO	MA400-EP	SHEM047-2	N/A	N/A
TURN DEVICE	INNCO	DE 3600-RH	SHEM047-3	N/A	N/A
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VULB9168	SHEM048-1	2019-10-14	2021-10-13
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020-05-25	2023-05-24
Low Amplifier	CLAVIIO	BDLNA-0001-412010	SHEM164-1	2020-08-13	2021-08-12

Radiated Emissions (above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2020-12-20	2021-12-19
CONTROLLER	INNCO	CO200	SHEM047-1	N/A	N/A
ANTENNA MAST	INNCO	MA400-EP	SHEM047-2	N/A	N/A
TURN DEVICE	INNCO	DE 3600-RH	SHEM047-3	N/A	N/A
Double ridged broadband horn ANTENNA	SCHWARZBECK	BBHA9120D	SHEM050-1	2019-10-14	2021-10-13
High-amplifier	SCHWARZBECK	SCU-F0118-G40-BZ4-CS	SHEM050-2	2020-12-20	2021-12-19
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020-05-25	2023-05-24

Harmonic Current Emission & Voltage Fluctuations and Flicker					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Harmonic&Flicker analyzer	AMETEK	PACS-1	SHEM024-2	2020-06-30	2021-06-29
AC Power Source 5KVA	AMETEK	5001iX	SHEM025-2	2020-07-17	2021-07-16
Test software	AMETEK	CTS4	Version: 4.24.0	N/A	N/A



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Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-2	2020-08-13	2021-08-12

Electrical Fast Transients/Burst at Power Port					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2020-12-20	2021-12-19
Test software	EMC PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2021-04-15	2022-04-14
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2021-04-15	2022-04-14

Electrical Fast Transients/Burst at Signal Port					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2020-12-20	2021-12-19
Test software	EMC PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2021-04-15	2022-04-14
Capacitive coupling clamp	EM test	HFK	SHEM026-2	2020-12-20	2021-12-19
Data coupling network 4 line	EM test	CNV 504	SHEM026-3	2020-12-20	2021-12-19

Surge at Power Port					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2020-12-20	2021-12-19
Test software	EMC PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2021-04-15	2022-04-14
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2021-04-15	2022-04-14



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Conducted Immunity at Power Port (150kHz-80MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2020-08-13	2021-08-12
Power Amplifier	HAEFFLY	PAMP250	SHEM023-1	2020-12-20	2021-12-19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2020-12-20	2021-12-19
Coupling clamp	LUTHI	EM 101	SHEM027-1	2020-12-20	2021-12-19
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M1	SHEM023-5	2020-12-20	2021-12-19
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M2/M3	SHEM023-6	2020-12-20	2021-12-19
RF Generator	SCHAFFNER	NSG 2070	SHEM221-1	2020-05-27	2021-05-26
Shielding Room	ZHONGYU	5*5*3M	SHEM079-6	2019-12-20	2022-12-19
Coupling and Decoupling Network	Teseq	CDN M016	SHEM168-1	2020-08-13	2021-08-12

Conducted Immunity at Signal Port (150kHz-80MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2020-08-13	2021-08-12
Power Amplifier	HAEFFLY	PAMP250	SHEM023-1	2020-12-20	2021-12-19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2020-12-20	2021-12-19
Coupling clamp	LUTHI	EM 101	SHEM027-1	2020-12-20	2021-12-19
Shielding Room	ZHONGYU	5*5*3M	SHEM079-6	2019-12-20	2022-12-19

Voltage Dips and Interruptions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2020-12-20	2021-12-19
Test software	EMC PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2021-04-15	2022-04-14
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2021-04-15	2022-04-14
Manual step transformer	TESEQ	INA 6501	SHEM224-4	2021-04-15	2022-04-14

Radiated Immunity (80MHz-6GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2020-08-13	2021-08-12
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2021-04-15	2022-04-14
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2021-04-15	2022-04-14
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2020-12-20	2021-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2021-04-15	2022-04-14
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2020-08-13	2021-08-12



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(86-21) 61915666 f(86-21) 61915678 www.sgs.com.cn  
 (86-21) 61915666 f(86-21) 61915678 e.sgs.china@sgs.com

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Digital pressure meter	YONGZHI	DYM3-01	SHEM082-1	2021-01-22	2024-01-21
Temperature&humidity recorder	ShangHai weather meter work	ZJ 1-2B	SHEM042-1~6	2020-09-11	2021-09-10
Digital Multimeter	FLUKE	17B	SHEM043-3	2020-09-09	2021-09-08
Autoformer regulator	Guangzhou bao de	TDGC2-5KVA	SHEM150-1	N/A	N/A
Multi-purpose tong tester	FLUKE	316	SHEM001-1	2020-12-20	2021-12-19



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## 6 Emission Test Results

### 6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	EN 61000-6-3:2007 +A1:2011
Test Method:	CISPR 16-2-1
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

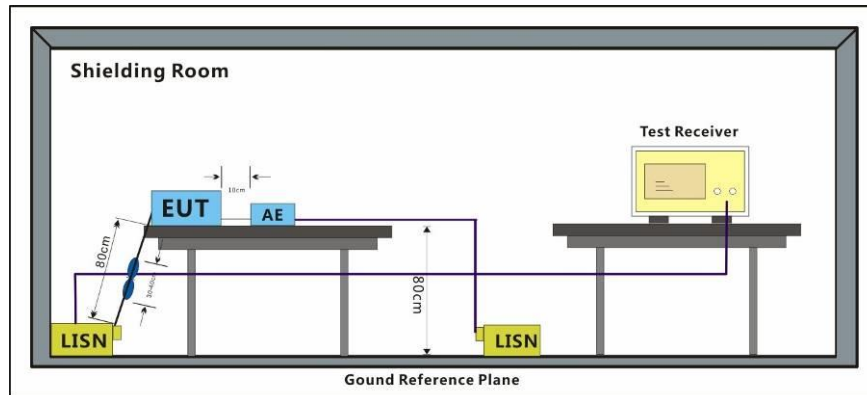
#### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Charging : keep battery charging continual .

#### 6.1.2 Test Setup Diagram



#### 6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

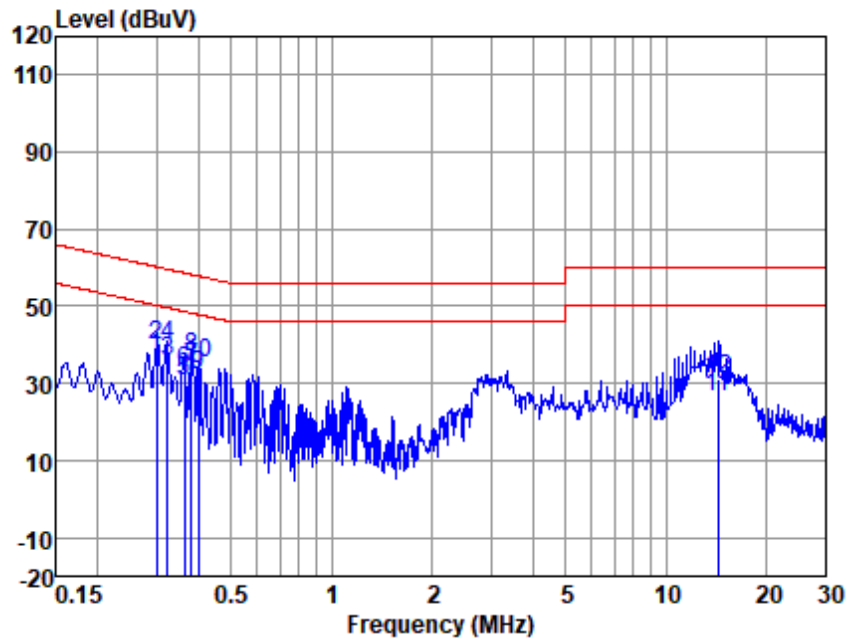


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Mode:a; Line:Live Line



LISN : LINE  
 EUT/Project No : 2922BA  
 Test Mode : a

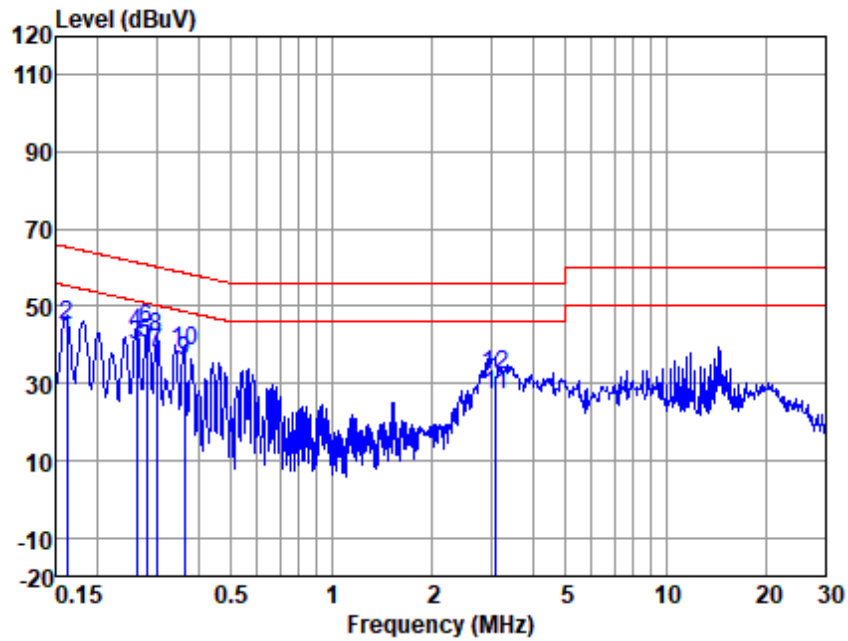
Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark	
1	0.30	26.68	0.20	9.94	36.82	50.24	-13.42	Average
2	0.30	29.68	0.20	9.94	39.82	60.24	-20.42	QP
3	0.32	25.55	0.20	9.94	35.69	49.66	-13.97	Average
4	0.32	29.55	0.20	9.94	39.69	59.66	-19.97	QP
5	0.36	20.64	0.20	9.93	30.77	48.69	-17.92	Average
6	0.36	23.08	0.20	9.93	33.21	58.69	-25.48	QP
7	0.38	24.09	0.20	9.93	34.22	48.25	-14.03	Average
8	0.38	26.73	0.20	9.93	36.86	58.25	-21.39	QP
9	0.40	21.94	0.20	9.93	32.07	47.86	-15.79	Average
10	0.40	24.91	0.20	9.93	35.04	57.86	-22.82	QP
11	14.29	16.13	0.48	10.13	26.74	50.00	-23.26	Average
12	14.29	20.45	0.48	10.13	31.06	60.00	-28.94	QP

Notes: Emission Level = Read Level + LISN Factor + Cable loss



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Mode:a; Line:Neutral Line



LISN : NEUTRAL  
 EUT/Project No : 2922BA  
 Test Mode : a

Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark	
1	0.16	31.59	0.20	9.90	41.69	55.38	-13.69	Average
2	0.16	35.08	0.20	9.90	45.18	65.38	-20.20	QP
3	0.26	29.76	0.20	9.94	39.90	51.42	-11.52	Average
4	0.26	33.00	0.20	9.94	43.14	61.42	-18.28	QP
5	0.28	30.51	0.20	9.94	40.65	50.81	-10.16	Average
6	0.28	33.94	0.20	9.94	44.08	60.81	-16.73	QP
7	0.30	27.74	0.20	9.94	37.88	50.24	-12.36	Average
8	0.30	31.60	0.20	9.94	41.74	60.24	-18.50	QP
9	0.36	25.79	0.20	9.93	35.92	48.69	-12.77	Average
10	0.36	28.12	0.20	9.93	38.25	58.69	-20.44	QP
11	3.11	16.92	0.20	9.98	27.10	46.00	-18.90	Average
12	3.11	22.10	0.20	9.98	32.28	56.00	-23.72	QP

Notes: Emission Level = Read Level + LISN Factor + Cable loss



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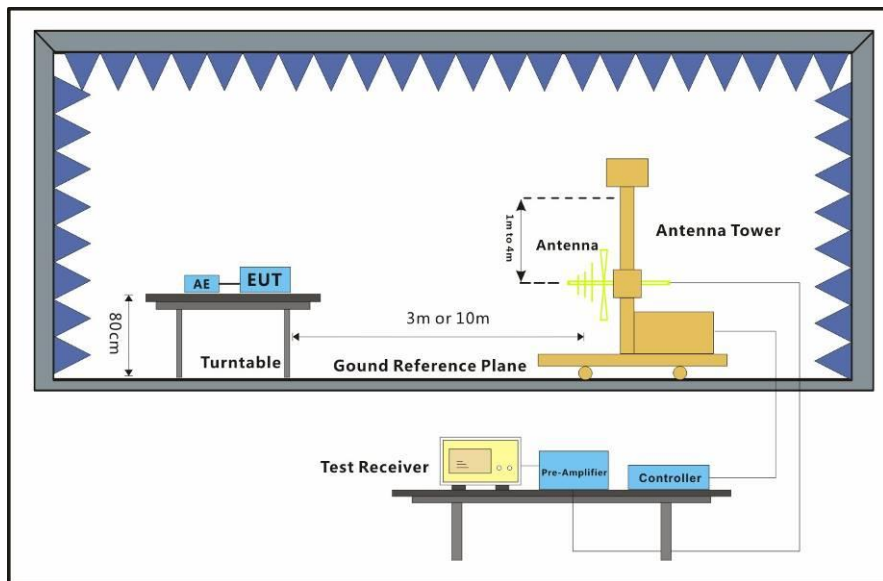
## 6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN 61000-6-3:2007 +A1:2011  
 Test Method: CISPR 16-2-3  
 Frequency Range: 30MHz to 1GHz  
 Measurement Distance: 3m  
 Limit:  
 30MHz-230MHz 40 dB(μV/m) quasi-peak  
 230MHz-1GHz 47 dB(μV/m) quasi-peak  
 Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

### 6.2.1 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Charging : keep battery charging continual .  
 b: Discharging : keep battery discharging continual .

### 6.2.2 Test Setup Diagram



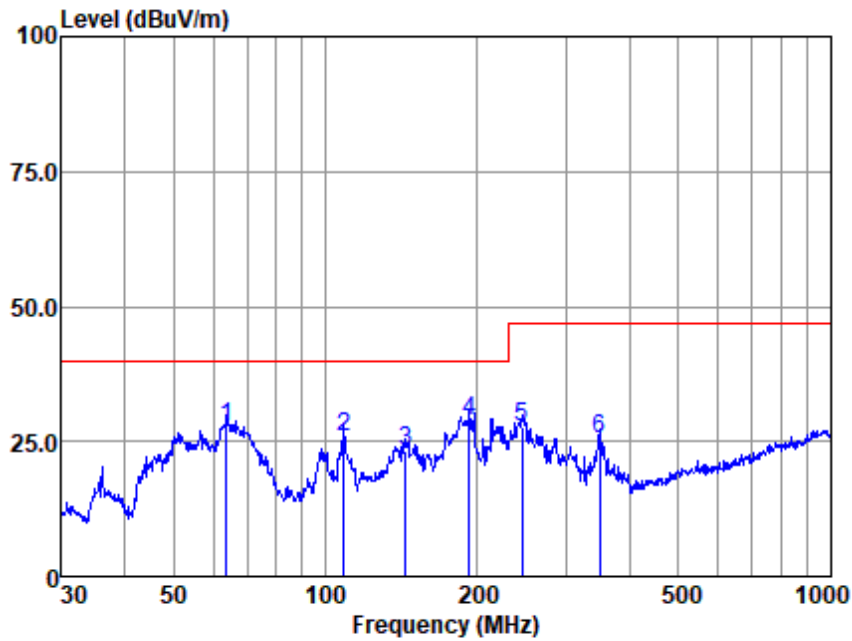
### 6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



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Mode:a; Polarization:Horizontal



Antenna Polarity :HORIZONTAL  
 EUT/Project :2922BA  
 Test mode :a

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	63.759	56.30	12.56	1.15	42.30	27.71	40.00	-12.29 QP
2	108.647	56.80	9.90	1.56	42.28	25.98	40.00	-14.02 QP
3	143.830	51.05	12.66	1.82	42.21	23.32	40.00	-16.68 QP
4	193.095	58.32	10.30	2.18	42.20	28.60	40.00	-11.40 QP
5	245.090	56.03	11.28	2.56	42.11	27.76	47.00	-19.24 QP
6	349.250	50.09	14.29	2.98	41.91	25.45	47.00	-21.55 QP

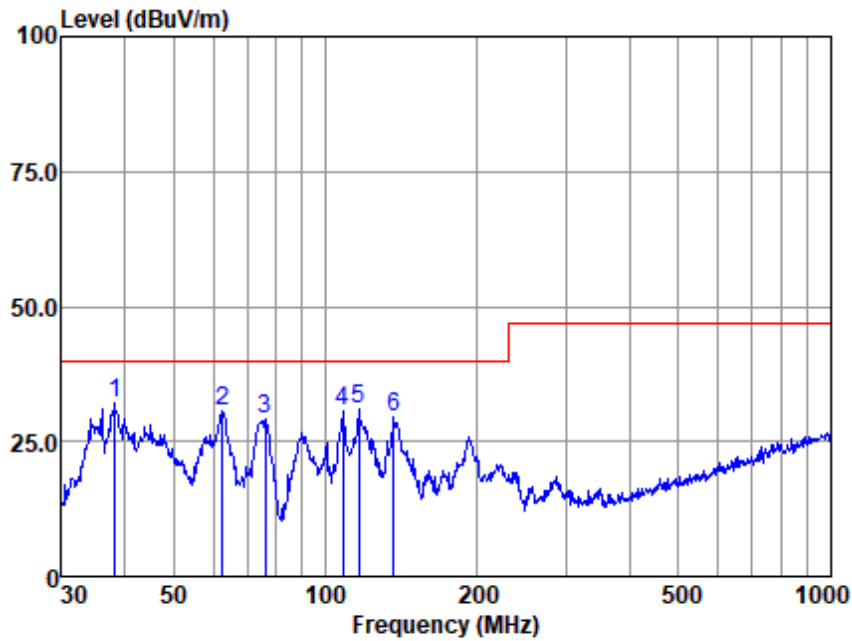
Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL  
 EUT/Project :2922BA  
 Test mode :a

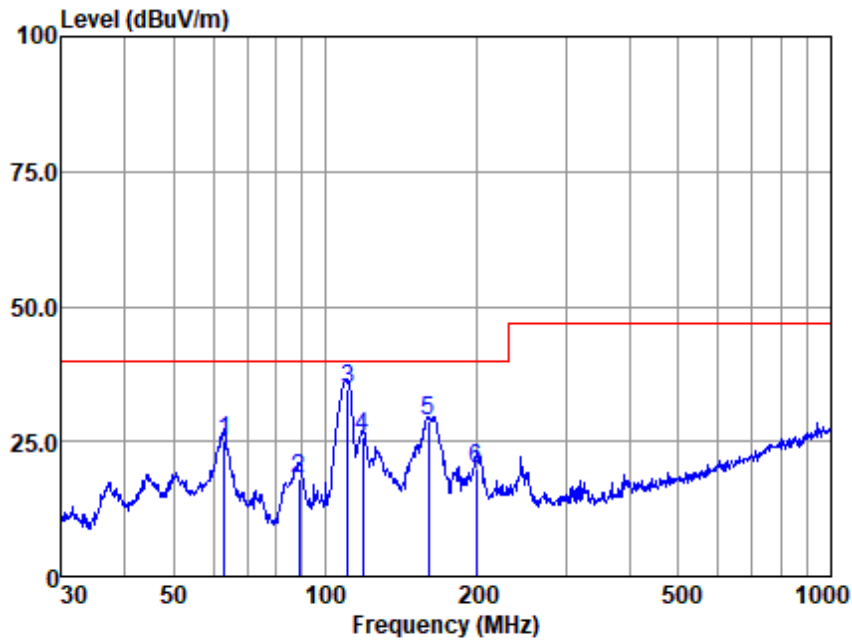
	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	38.212	60.60	12.93	0.86	42.32	32.07	40.00	-7.93 QP
2	62.651	59.18	12.72	1.14	42.30	30.74	40.00	-9.26 QP
3	75.977	59.84	10.19	1.27	42.30	29.00	40.00	-11.00 QP
4	108.267	61.52	9.85	1.56	42.28	30.65	40.00	-9.35 QP
5	116.540	60.80	10.70	1.62	42.26	30.86	40.00	-9.14 QP
6	136.460	57.68	12.27	1.77	42.22	29.50	40.00	-10.50 QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Mode:b; Polarization:Horizontal



Antenna Polarity :HORIZONTAL  
 EUT/Project :2922BA  
 Test mode :b

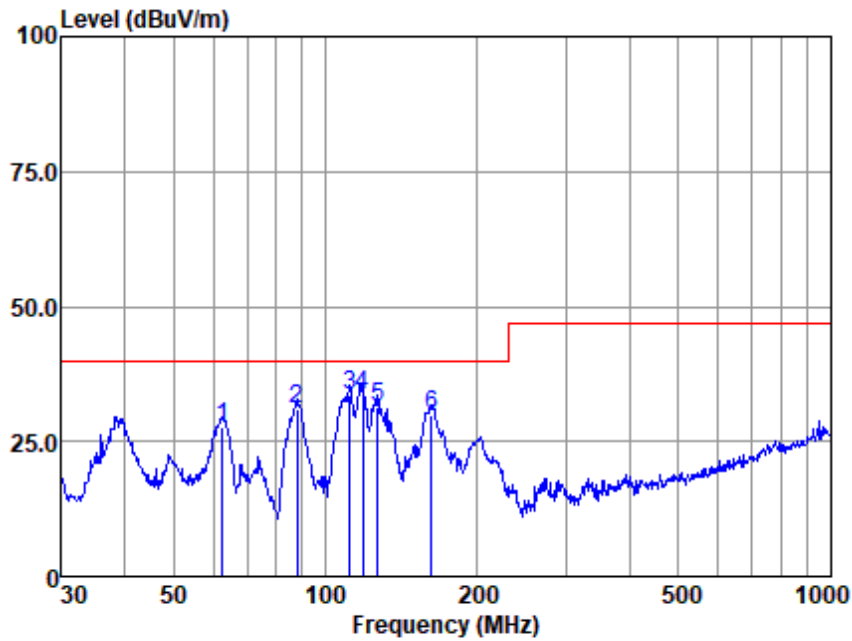
	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	63.092	53.77	12.65	1.14	42.30	25.26	40.00	-14.74 QP
2	88.652	51.10	7.88	1.39	42.30	18.07	40.00	-21.93 QP
3	110.569	65.26	10.14	1.57	42.28	34.69	40.00	-5.31 QP
4	118.601	55.59	10.89	1.64	42.26	25.86	40.00	-14.14 QP
5	159.784	55.75	13.20	1.92	42.20	28.67	40.00	-11.33 QP
6	198.588	49.75	9.98	2.22	42.20	19.75	40.00	-20.25 QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Mode:b; Polarization:Vertical



Antenna Polarity :VERTICAL  
 EUT/Project :2922BA  
 Test mode :b

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	62.431	55.95	12.75	1.14	42.30	27.54	40.00	-12.46 QP
2	88.033	63.89	7.97	1.38	42.30	30.94	40.00	-9.06 QP
3	111.738	64.02	10.25	1.59	42.27	33.59	40.00	-6.41 QP
4	118.601	63.43	10.89	1.64	42.26	33.70	40.00	-6.30 QP
5	126.772	60.45	11.56	1.69	42.24	31.46	40.00	-8.54 QP
6	162.041	57.04	13.11	1.93	42.20	29.88	40.00	-10.12 QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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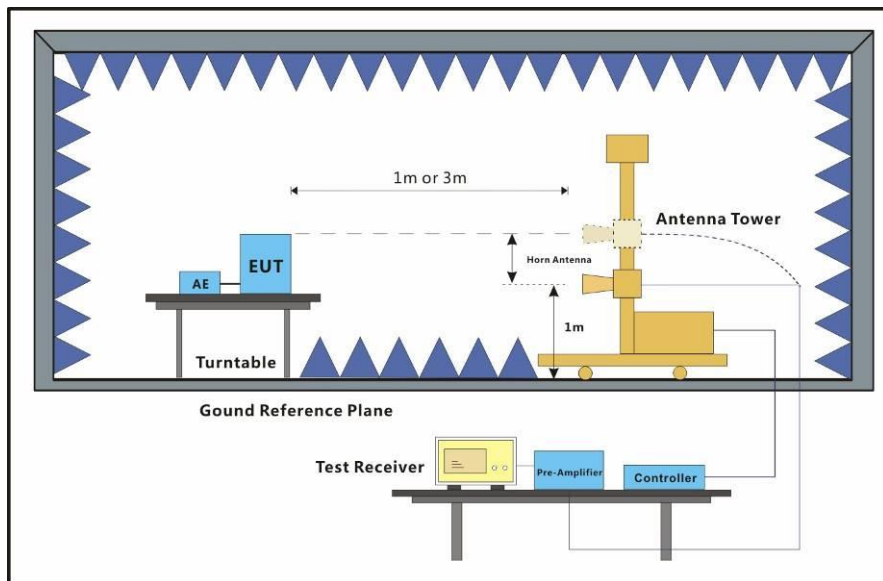
### 6.3 Radiated Emissions (above 1GHz)

Test Requirement: EN 61000-6-3:2007 +A1:2011  
 Test Method: CISPR 16-2-3  
 Frequency Range: Above 1GHz  
 Measurement Distance: 3m  
 Limit:  
 1GHz-3GHz 70 dB(μV/m) peak, 50 dB(μV/m) average  
 3GHz-6GHz 74 dB(μV/m) peak, 54dB(μV/m) average  
 Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 6000MHz

#### 6.3.1 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Charging : keep battery charging continual .  
 b: Discharging : keep battery discharging continual .

#### 6.3.2 Test Setup Diagram



#### 6.3.3 Measurement Data

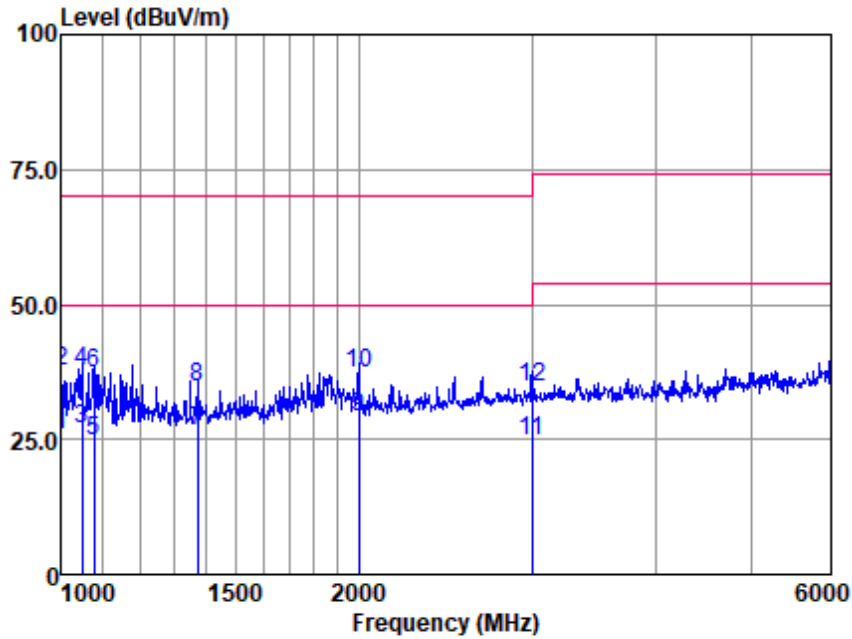
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.



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Mode:a; Polarization:Horizontal



Antenna Polarity :HORIZONTAL  
 EUT/Project :2922BA  
 Test mode :a

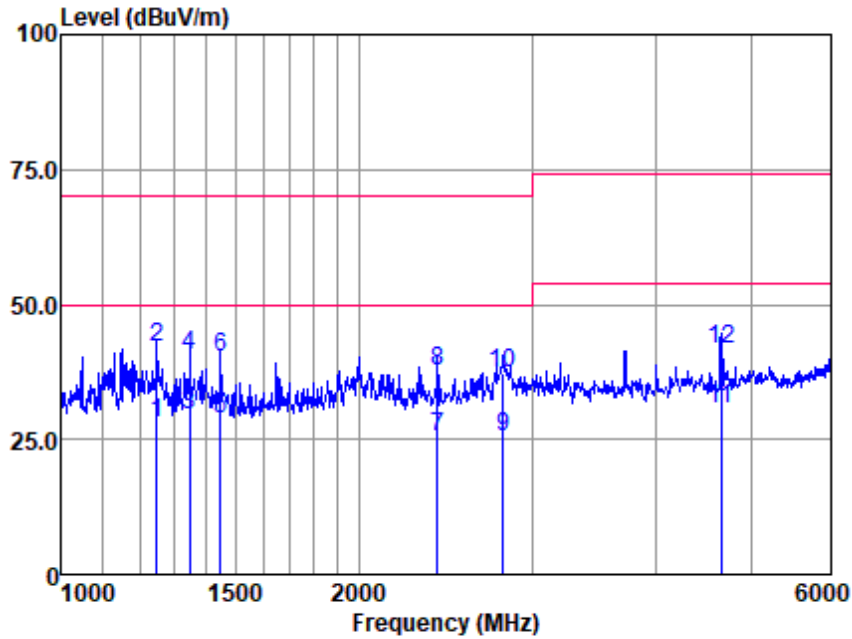
	Read	Antenna	Cable	Preamp	Emission	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1000.000	39.02	23.90	4.10	41.10	25.92	50.00	-24.08	Average
2	1000.000	50.70	23.90	4.10	41.10	37.60	70.00	-32.40	Peak
3	1049.567	39.96	24.05	4.21	41.11	27.11	50.00	-22.89	Average
4	1049.567	50.47	24.05	4.21	41.11	37.62	70.00	-32.38	Peak
5	1078.158	37.52	24.12	4.27	41.12	24.79	50.00	-25.21	Average
6	1078.158	49.89	24.12	4.27	41.12	37.16	70.00	-32.84	Peak
7	1373.197	38.00	24.84	4.87	41.18	26.53	50.00	-23.47	Average
8	1373.197	46.02	24.84	4.87	41.18	34.55	70.00	-35.45	Peak
9	2000.528	38.82	25.80	5.84	41.30	29.16	50.00	-20.84	Average
10	2000.528	46.90	25.80	5.84	41.30	37.24	70.00	-32.76	Peak
11	2993.840	31.10	28.58	7.33	42.40	24.61	50.00	-25.39	Average
12	2993.840	41.05	28.58	7.33	42.40	34.56	70.00	-35.44	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL  
 EUT/Project :2922BA  
 Test mode :a

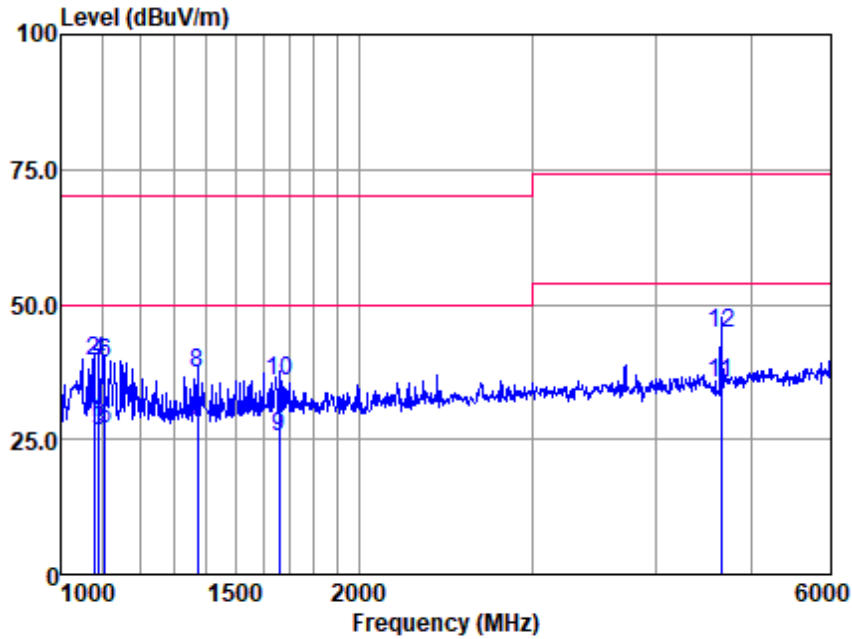
	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1248.794	40.14	24.56	4.64	41.15	28.19	50.00	-21.81 Average
2	1248.794	53.92	24.56	4.64	41.15	41.97	70.00	-28.03 Peak
3	1348.812	41.07	24.79	4.82	41.17	29.51	50.00	-20.49 Average
4	1348.812	52.27	24.79	4.82	41.17	40.71	70.00	-29.29 Peak
5	1449.030	39.82	25.00	4.99	41.19	28.62	50.00	-21.38 Average
6	1449.030	51.24	25.00	4.99	41.19	40.04	70.00	-29.96 Peak
7	2401.685	33.91	27.27	6.52	42.40	25.30	50.00	-24.70 Average
8	2401.685	46.10	27.27	6.52	42.40	37.49	70.00	-32.51 Peak
9	2796.783	32.55	28.22	7.11	42.40	25.48	50.00	-24.52 Average
10	2796.783	44.43	28.22	7.11	42.40	37.36	70.00	-32.64 Peak
11	4652.151	32.57	30.92	9.52	42.40	30.61	54.00	-23.39 Average
12	4652.151	43.59	30.92	9.52	42.40	41.63	74.00	-32.37 Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Mode:b; Polarization:Horizontal



Antenna Polarity :HORIZONTAL  
 EUT/Project :2922BA  
 Test mode :b

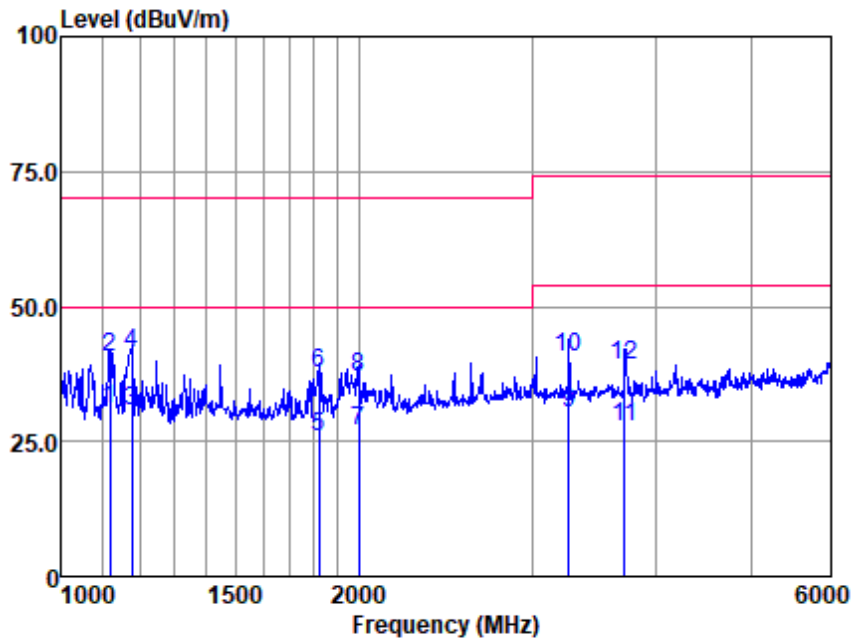
	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1078.158	40.89	24.12	4.27	41.12	28.16	50.00	-21.84 Average
2	1078.158	52.17	24.12	4.27	41.12	39.44	70.00	-30.56 Peak
3	1091.766	39.11	24.16	4.33	41.12	26.48	50.00	-23.52 Average
4	1091.766	52.28	24.16	4.33	41.12	39.65	70.00	-30.35 Peak
5	1105.545	39.49	24.20	4.36	41.12	26.93	50.00	-23.07 Average
6	1105.545	51.61	24.20	4.36	41.12	39.05	70.00	-30.95 Peak
7	1373.197	39.95	24.84	4.87	41.18	28.48	50.00	-21.52 Average
8	1373.197	48.60	24.84	4.87	41.18	37.13	70.00	-32.87 Peak
9	1660.416	36.17	25.34	5.36	41.26	25.61	50.00	-24.39 Average
10	1660.416	46.34	25.34	5.36	41.26	35.78	70.00	-34.22 Peak
11	4652.151	37.46	30.92	9.52	42.40	35.50	54.00	-18.50 Average
12	4652.151	46.73	30.92	9.52	42.40	44.77	74.00	-29.23 Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Mode:b; Polarization:Vertical



Antenna Polarity :VERTICAL  
 EUT/Project :2922BA  
 Test mode :b

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1119.499	43.55	24.23	4.39	41.13	31.04	50.00	-18.96	Average
2	1119.499	53.11	24.23	4.39	41.13	40.60	70.00	-29.40	Peak
3	1177.096	42.71	24.38	4.50	41.14	30.45	50.00	-19.55	Average
4	1177.096	53.47	24.38	4.50	41.14	41.21	70.00	-28.79	Peak
5	1822.555	35.94	25.58	5.56	41.30	25.78	50.00	-24.22	Average
6	1822.555	47.86	25.58	5.56	41.30	37.70	70.00	-32.30	Peak
7	2000.528	36.68	25.80	5.84	41.30	27.02	50.00	-22.98	Average
8	2000.528	46.68	25.80	5.84	41.30	37.02	70.00	-32.98	Peak
9	3262.720	36.23	28.60	7.91	42.40	30.34	54.00	-23.66	Average
10	3262.720	46.56	28.60	7.91	42.40	40.67	74.00	-33.33	Peak
11	3718.646	32.35	29.09	8.74	42.40	27.78	54.00	-26.22	Average
12	3718.646	43.71	29.09	8.74	42.40	39.14	74.00	-34.86	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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### 6.4 Harmonic Current Emission

Test Requirement: EN 61000-6-3:2007 +A1:2011

Test Method: EN IEC 61000-3-2:2019

Frequency Range: 100Hz to 2kHz

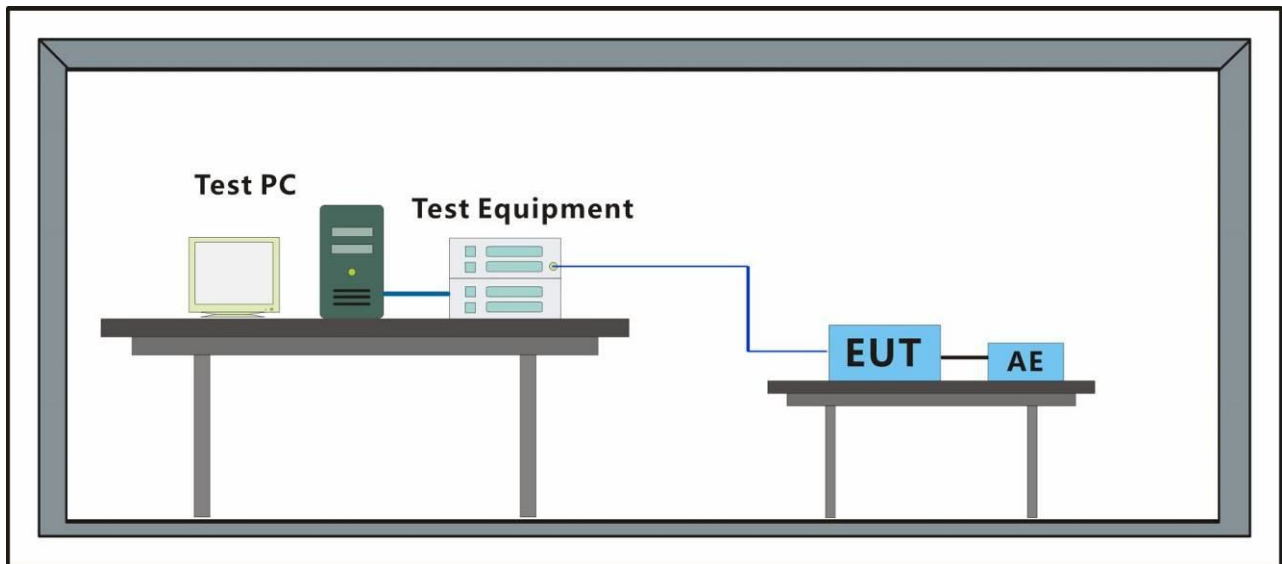
#### 6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Charging : keep battery charging continual .

#### 6.4.2 Test Setup Diagram



#### 6.4.3 Measurement Data



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Mode:a

**Average harmonic current results**

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	1.741			
2	19.242E-3	1.782	1.08	PASS
3	1.507	65.536	2.30	PASS
4	17.617E-3			PASS
5	1.023	89.737	1.14	PASS
6	14.155E-3			PASS
7	510.00E-3	66.234	770.00E-3	PASS
8	10.522E-3			PASS
9	311.505E-3	77.876	400.00E-3	PASS
10	6.853E-3			PASS
11	231.375E-3	70.114	330.00E-3	PASS
12	4.101E-3			PASS
13	132.638E-3	63.161	210.00E-3	PASS
14	2.456E-3			PASS
15	101.753E-3	67.835	150.00E-3	PASS
16	2.075E-3			PASS
17	100.383E-3	75.847	132.35E-3	PASS
18	2.304E-3			PASS
19	80.647E-3	68.103	118.42E-3	PASS
20	1.827E-3			PASS
21	118.373E-3	73.656	160.71E-3	PASS
22	2.118E-3			PASS
23	99.254E-3	67.637	146.74E-3	PASS
24	1.920E-3			PASS
25	67.397E-3	49.924	135.00E-3	PASS
26	2.221E-3			PASS
27	46.149E-3	36.920	124.99E-3	PASS
28	2.353E-3			PASS
29	43.735E-3	37.578	116.39E-3	PASS
30	2.280E-3			PASS
31	47.983E-3	44.074	108.87E-3	PASS
32	1.766E-3			PASS
33	49.252E-3	48.159	102.27E-3	PASS
34	1.563E-3			PASS
35	41.871E-3	43.419	96.44E-3	PASS
36	1.804E-3			PASS
37	31.788E-3	34.850	91.21E-3	PASS
38	1.666E-3			PASS
39	27.531E-3	31.815	86.53E-3	PASS
40	1.851E-3			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.



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**Maximum harmonic current results**

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	2.047			
2	31.926E-3	1.971	1.62	PASS
3	1.786	51.762	3.45	PASS
4	29.161E-3	4.521	645.00E-3	PASS
5	1.575	92.113	1.71	PASS
6	24.366E-3	5.415	450.00E-3	PASS
7	1.023	88.957	1.15	PASS
8	18.925E-3			PASS
9	436.259E-3	72.710	600.00E-3	PASS
10	13.532E-3			PASS
11	310.555E-3	62.738	495.00E-3	PASS
12	8.854E-3			PASS
13	201.487E-3	63.964	315.00E-3	PASS
14	5.626E-3			PASS
15	215.676E-3	95.856	225.00E-3	PASS
16	4.411E-3			PASS
17	145.268E-3	73.174	198.52E-3	PASS
18	4.356E-3			PASS
19	139.767E-3	78.685	177.63E-3	PASS
20	3.117E-3			PASS
21	129.133E-3	80.352	160.71E-3	PASS
22	3.435E-3			PASS
23	101.787E-3	69.363	146.74E-3	PASS
24	3.543E-3			PASS
25	78.247E-3	57.961	135.00E-3	PASS
26	3.640E-3			PASS
27	52.911E-3	42.330	124.99E-3	PASS
28	3.688E-3			PASS
29	60.738E-3	52.187	116.39E-3	PASS
30	3.566E-3			PASS
31	64.641E-3	59.374	108.87E-3	PASS
32	3.421E-3			PASS
33	57.451E-3	56.176	102.27E-3	PASS
34	3.557E-3			PASS
35	45.189E-3	46.859	96.44E-3	PASS
36	3.680E-3			PASS
37	37.702E-3	41.334	91.21E-3	PASS
38	3.642E-3			PASS
39	33.501E-3	38.714	86.53E-3	PASS
40	3.509E-3			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.



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**Maximum harmonic voltage results**

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.23	100.537		
2	83.34E-3	0.036	0.2	PASS
3	272.84E-3	0.119	0.9	PASS
4	13.50E-3	0.006	0.2	PASS
5	281.74E-3	0.122	0.4	PASS
6	16.64E-3	0.007	0.2	PASS
7	246.65E-3	0.107	0.3	PASS
8	11.17E-3	0.005	0.2	PASS
9	254.18E-3	0.111	0.2	PASS
10	17.10E-3	0.007	0.2	PASS
11	85.92E-3	0.037	0.1	PASS
12	14.43E-3	0.006	0.1	PASS
13	154.63E-3	0.067	0.1	PASS
14	13.27E-3	0.006	0.1	PASS
15	68.55E-3	0.030	0.1	PASS
16	22.23E-3	0.010	0.1	PASS
17	98.69E-3	0.043	0.1	PASS
18	15.38E-3	0.007	0.1	PASS
19	85.94E-3	0.037	0.1	PASS
20	14.82E-3	0.006	0.1	PASS
21	177.35E-3	0.077	0.1	PASS
22	15.44E-3	0.007	0.1	PASS
23	177.47E-3	0.077	0.1	PASS
24	19.45E-3	0.008	0.1	PASS
25	87.94E-3	0.038	0.1	PASS
26	20.93E-3	0.009	0.1	PASS
27	106.49E-3	0.046	0.1	PASS
28	17.42E-3	0.008	0.1	PASS
29	159.98E-3	0.070	0.1	PASS
30	24.57E-3	0.011	0.1	PASS
31	118.55E-3	0.052	0.1	PASS
32	22.48E-3	0.010	0.1	PASS
33	111.17E-3	0.048	0.1	PASS
34	17.17E-3	0.007	0.1	PASS
35	93.11E-3	0.040	0.1	PASS
36	21.47E-3	0.009	0.1	PASS
37	104.48E-3	0.045	0.1	PASS
38	19.17E-3	0.008	0.1	PASS
39	121.38E-3	0.053	0.1	PASS
40	19.40E-3	0.008	0.1	PASS



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**Power and THD results - DS: 21**

True power P:	471.5W	Apparent power S:	836.2VA
Reactiv power Q:	690.5var	Power factor:	0.564
THD (U):	0.003	THD (I):	1.458
Crest Factor (U):	1.409	Crest Factor (I):	3.393



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**6.5 Voltage Fluctuations and Flicker**

Test Requirement: EN 61000-6-3:2007 +A1:2011

Test Method: EN 61000-3-3:2013+A1:2019

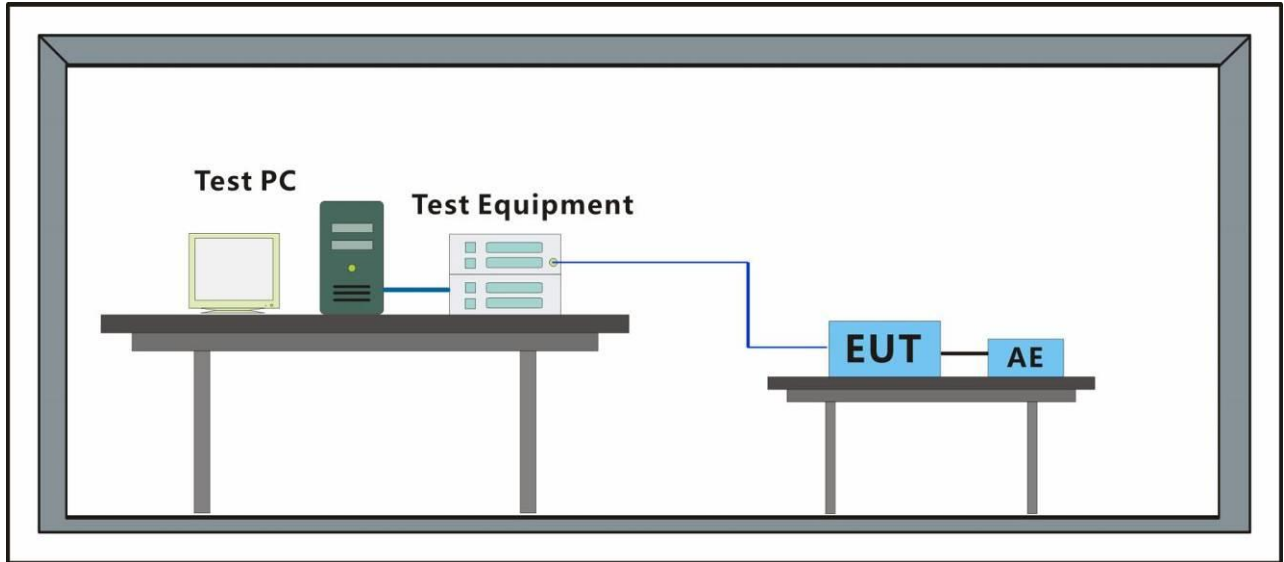
**6.5.1 E.U.T. Operation**

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Charging : keep battery charging continual .

**6.5.2 Test Setup Diagram**



**6.5.3 Measurement Data**

Mode:a

**Maximum Flicker results**

	EUT values	Limit	Result
Pst	0.415	1.00	PASS
Plt	0.317	0.65	PASS
dc [%]	0.817	3.30	PASS
dmax [%]	1.804	6.00	PASS
Tmax [s]	0.000	0.50	PASS



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## 7 Immunity Test Results

### 7.1 Performance Criteria Description in EN IEC 61000-6-1:2019

- Criterion A** The EUT shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
- Criterion B** The EUT shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
- Criterion C** Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.



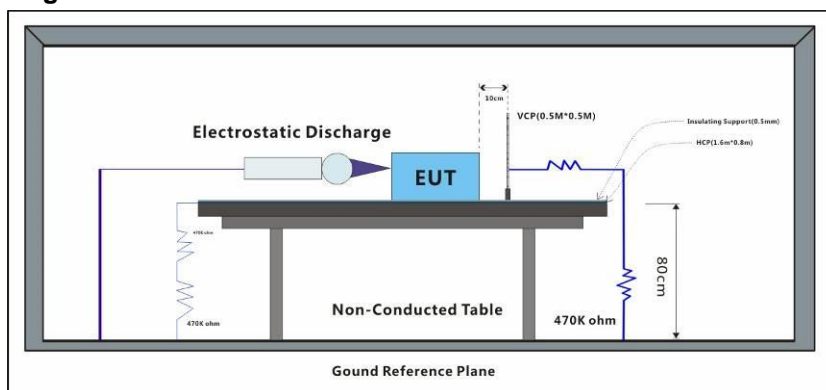
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## 7.2 Electrostatic Discharge

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-2:2009  
 Performance Criterion: B  
 Discharge Impedance: 330Ω/150pF  
 Number of Discharge: Minimum 10 times at each test point  
 Discharge Mode: Single Discharge  
 Discharge Period: 1 second minimum

### 7.2.1 Test Setup Diagram



### 7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Charging : keep battery charging continual .  
 b: Discharging : keep battery discharging continual .

### 7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

### Results:

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



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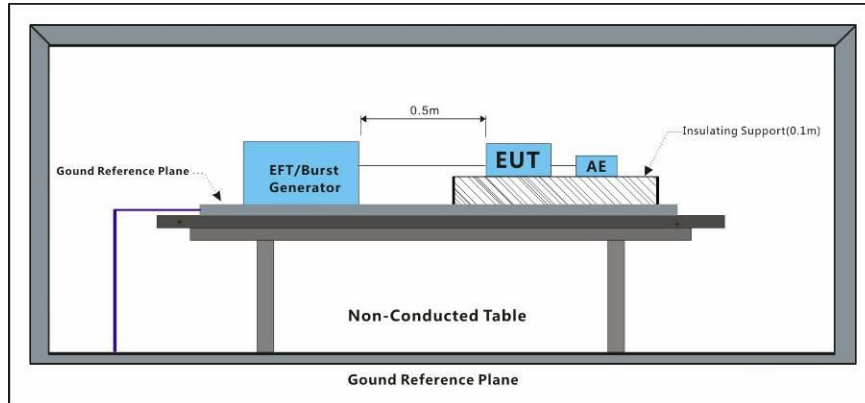
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### 7.3 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

#### 7.3.1 Test Setup Diagram



#### 7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Charging : keep battery charging continual .

#### 7.3.3 Test Results:

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A

#### Results:

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

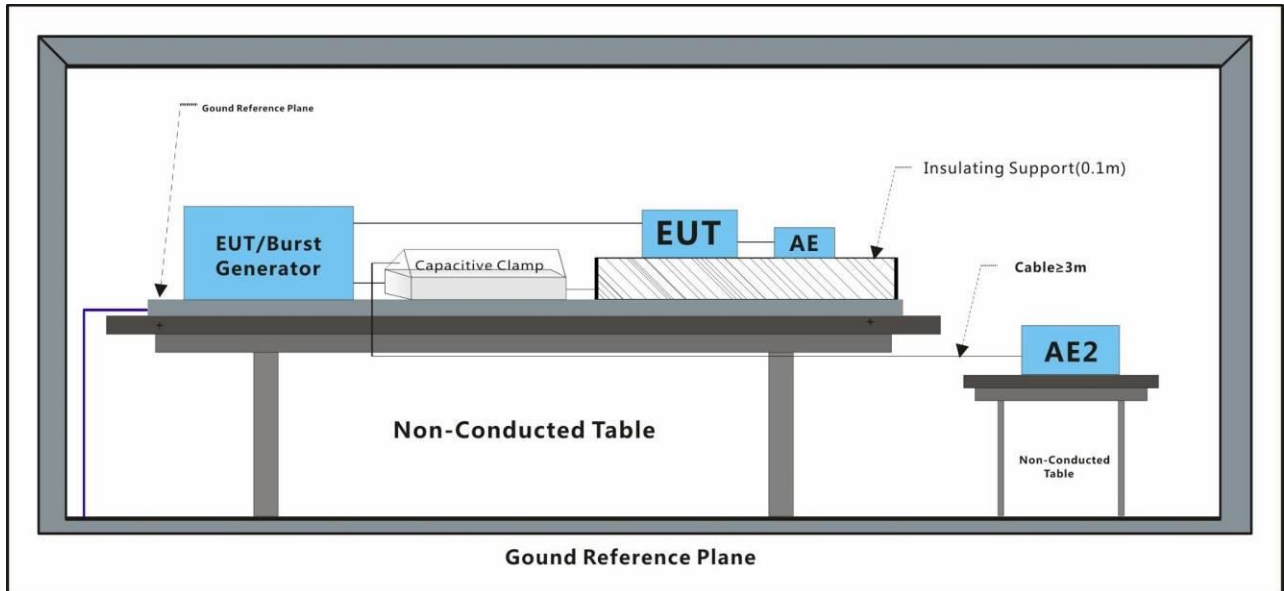


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### 7.4 Electrical Fast Transients/Burst at Signal Port

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

#### 7.4.1 Test Setup Diagram



#### 7.4.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Charging : keep battery charging continual .

#### 7.4.3 Test Results:

Port	Level (kV)	Polarity	CDN/Clamp	Result / Observations
Signal port	0.5	+	Clamp	A
Signal port	0.5	-	Clamp	A

#### Results:

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

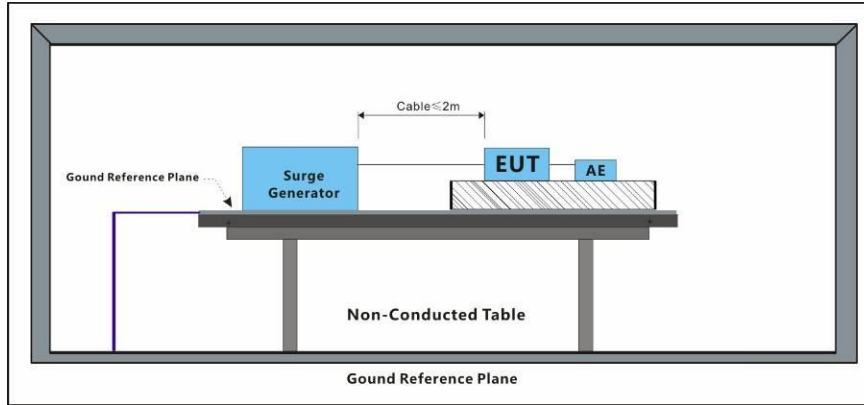


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### 7.5 Surge at Power Port

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-5:2014 +A1:2017  
 Performance Criterion: B  
 Interval: 60s between each surge  
 No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

#### 7.5.1 Test Setup Diagram



#### 7.5.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Charging : keep battery charging continual .

#### 7.5.3 Test Results:

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	0°	A
L-N	1	-	0°	A
L-N	1	+	90°	A
L-N	1	-	90°	A
L-N	1	+	180°	A
L-N	1	-	180°	A
L-N	1	+	270°	A
L-N	1	-	270°	A
L-PE	2	+	0°	A
L-PE	2	-	0°	A
L-PE	2	+	90°	A
L-PE	2	-	90°	A
L-PE	2	+	180°	A
L-PE	2	-	180°	A
L-PE	2	+	270°	A
L-PE	2	-	270°	A
N-PE	2	+	0°	A
N-PE	2	-	0°	A
N-PE	2	+	90°	A



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N-PE	2	-	90°	A
N-PE	2	+	180°	A
N-PE	2	-	180°	A
N-PE	2	+	270°	A
N-PE	2	-	270°	A

**Results:**

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



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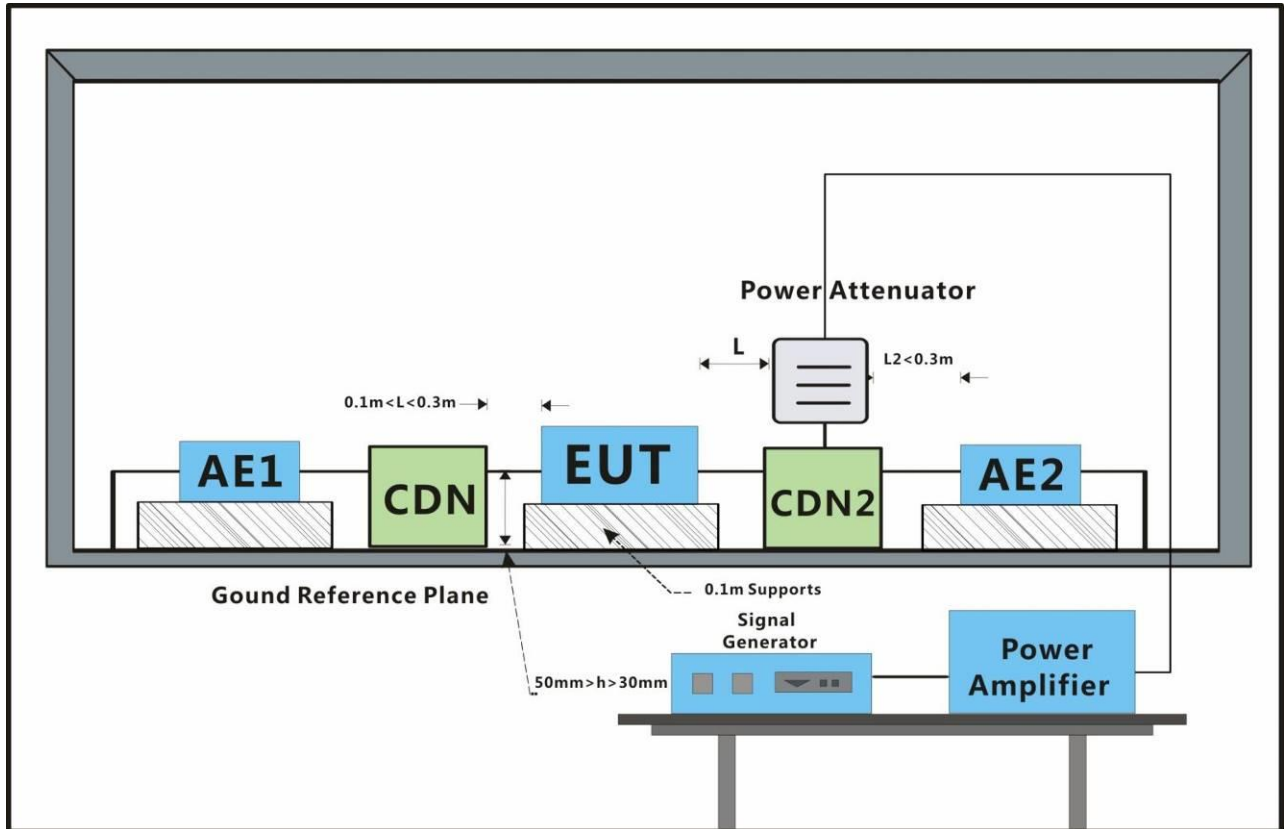
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### 7.6 Conducted Immunity at Power Port (150kHz-80MHz)

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

#### 7.6.1 Test Setup Diagram



#### 7.6.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Charging : keep battery charging continual .

#### 7.6.3 Test Results:

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CDN	3s	A

#### Results:

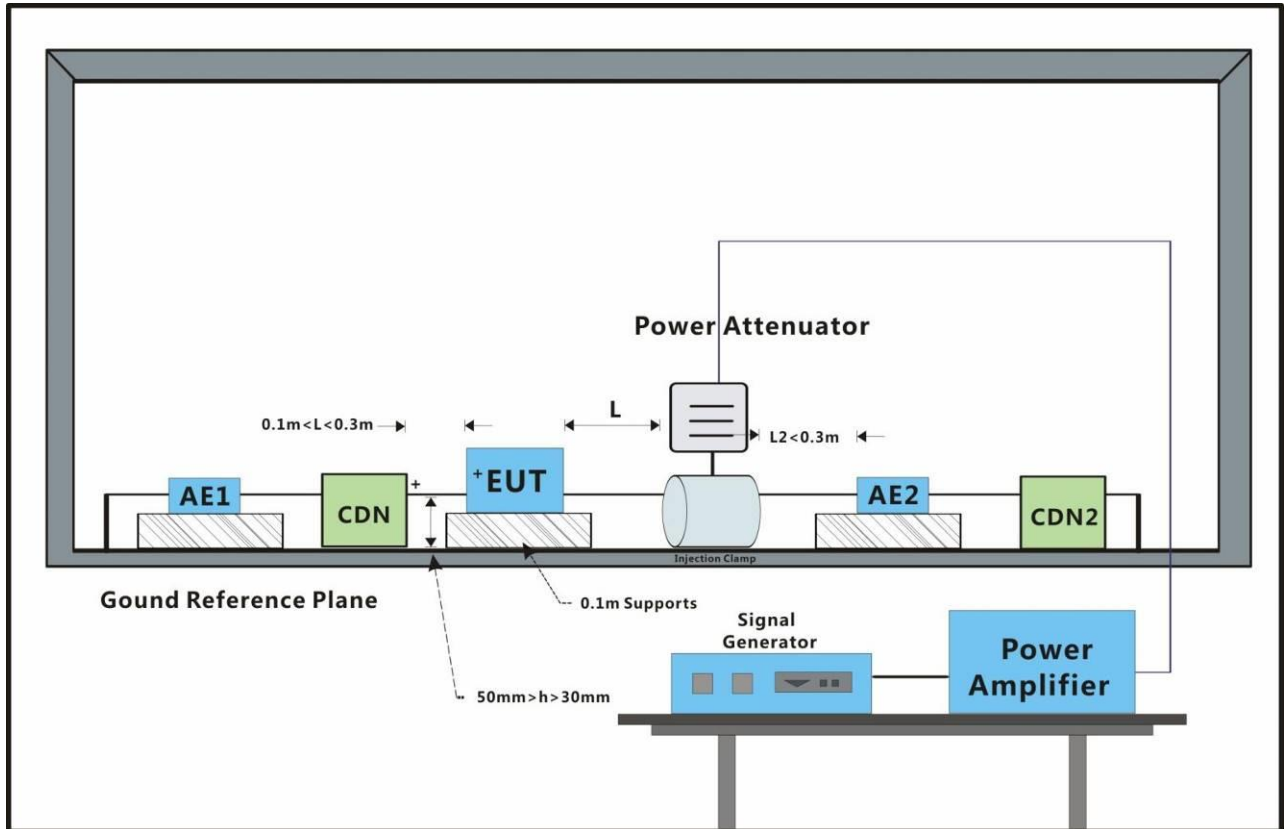
A: No degradation in the performance of the EUT was observed.



### 7.7 Conducted Immunity at Signal Port (150kHz-80MHz)

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

#### 7.7.1 Test Setup Diagram



#### 7.7.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Charging : keep battery charging continual .

#### 7.7.3 Test Results:

Port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
	3	Coupling	3s	A

#### Results:

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

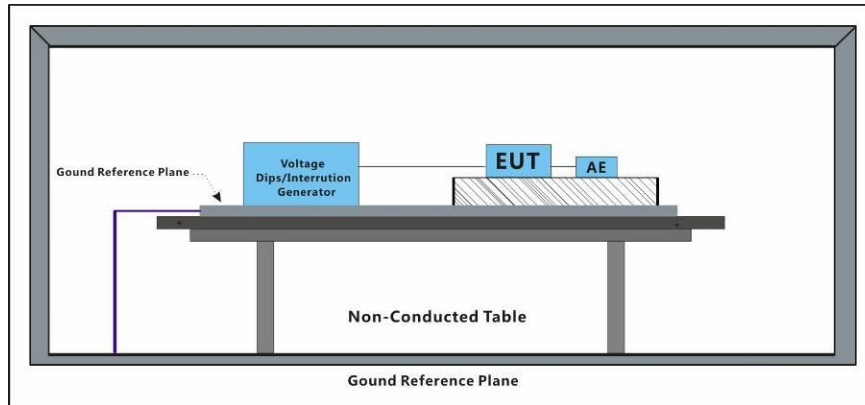


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### 7.8 Voltage Dips and Interruptions

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-11:2004 +A1:2017  
 Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Periods:B; 0% of UT for 1 Periods:B; 0% of UT for 250 Periods:C; 70% of UT for 25 Periods:C;  
 No. of Dips / Interruptions: 3 per Level  
 Time between dropout 10s

#### 7.8.1 Test Setup Diagram



#### 7.8.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Charging : keep battery charging continual .

#### 7.8.3 Test Results:

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Cycles	3	A
0	180°	0.5 Cycles	3	A
0	0°	1 Cycles	3	A
0	180°	1 Cycles	3	A
70	0°	25 Cycles	3	A
70	180°	25 Cycles	3	A
0	0°	250 Cycles	3	B
0	180°	250 Cycles	3	B

#### Results:

A: No degradation in the performance of the EUT was observed.  
 B: During test,EUT stop charging.After test,the EUT can resume charging automatically.

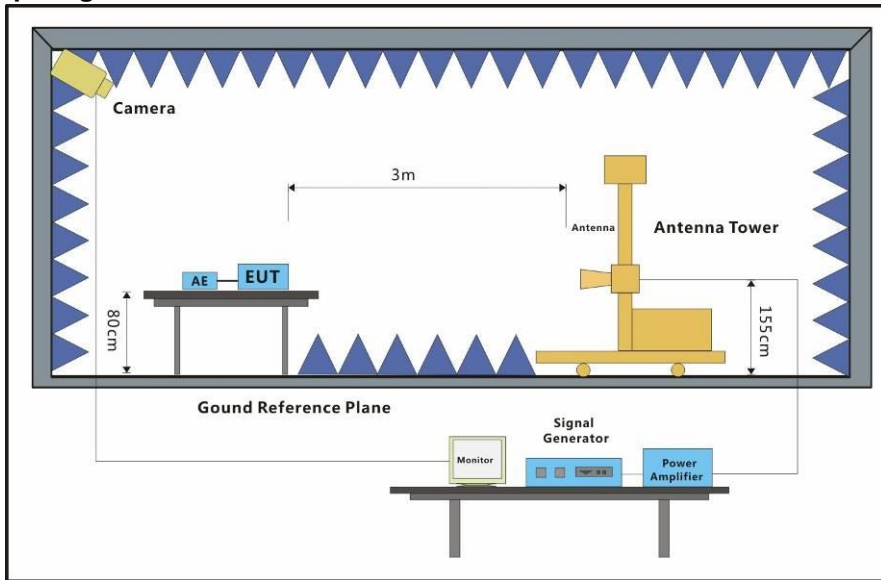


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### 7.9 Radiated Immunity (80MHz-6GHz)

Test Requirement: EN IEC 61000-6-1:2019  
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010  
 Performance Criterion: A  
 Frequency Range: 80MHz to 1GHz, 1.4GHz to 6GHz  
 Antenna Polarisation: Vertical and Horizontal  
 Modulation: 1kHz,80% Amp. Mod,1% increment

#### 7.9.1 Test Setup Diagram



#### 7.9.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode:  
 a: Charging : keep battery charging continual .  
 b: Discharging : keep battery discharging continual .

#### 7.9.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	3s	A
80MHz-1GHz	3	Back	3s	A
80MHz-1GHz	3	Left	3s	A
80MHz-1GHz	3	Right	3s	A
80MHz-1GHz	3	Top	3s	A
80MHz-1GHz	3	Underside	3s	A
1.4GHz-6GHz	3	Front	3s	A
1.4GHz-6GHz	3	Back	3s	A
1.4GHz-6GHz	3	Left	3s	A
1.4GHz-6GHz	3	Right	3s	A
1.4GHz-6GHz	3	Top	3s	A
1.4GHz-6GHz	3	Underside	3s	A

#### Results:

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



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## 8 Photographs

### 8.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup



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## 8.2 Radiated Emissions (30MHz-1GHz) Test Setup



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### 8.3 Radiated Emissions (above 1GHz) Test Setup



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### 8.4 Harmonic Current Emission & Voltage Fluctuations and Flicker Test Setup



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### 8.5 Electrostatic Discharge Test Setup



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### 8.6 Electrical Fast Transients/Burst at Power Port Test Setup



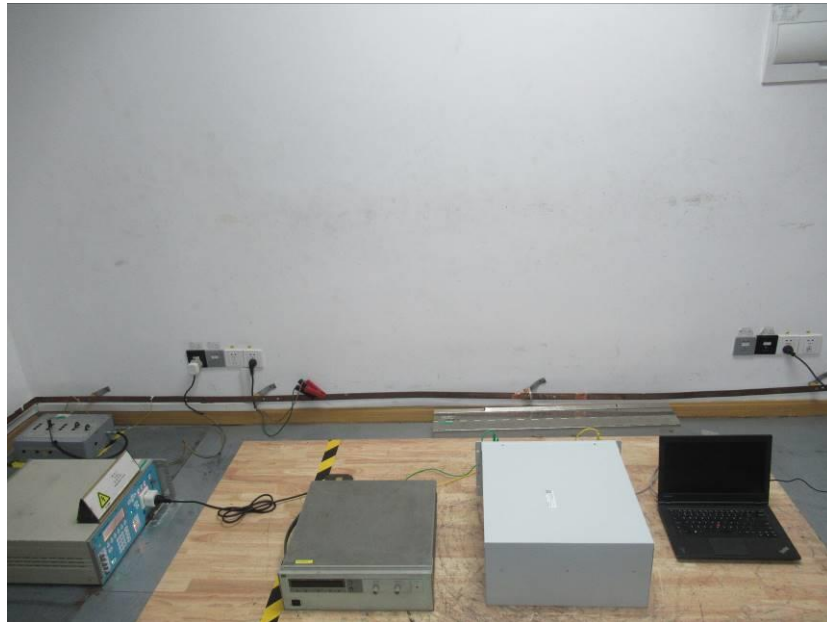
### 8.7 Electrical Fast Transients/Burst at Signal Port Test Setup



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### 8.8 Surge at Power Port Test Setup



### 8.9 Conducted Immunity at Power Port (150kHz-80MHz) Test Setup



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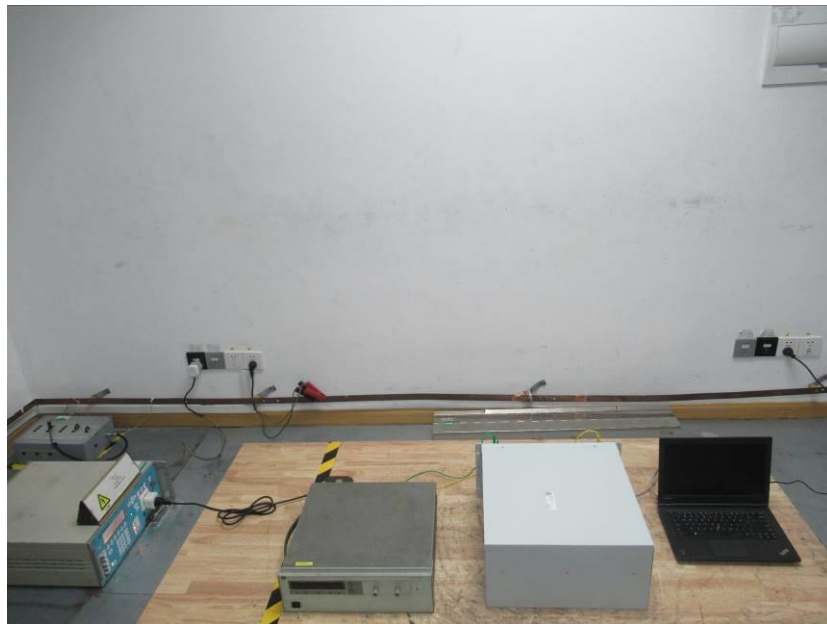
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### 8.10 Conducted Immunity at Signal Port (150kHz-80MHz) Test Setup



### 8.11 Voltage Dips and Interruptions Test Setup



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### 8.12 Radiated Immunity (80MHz-6GHz) Test Setup



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8.13 EUT Constructional Details (EUT Photos)



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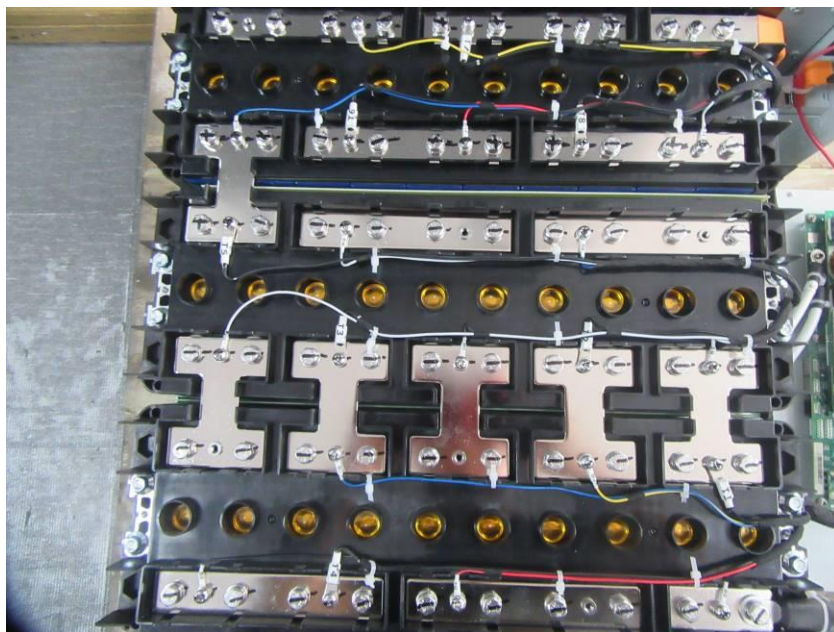
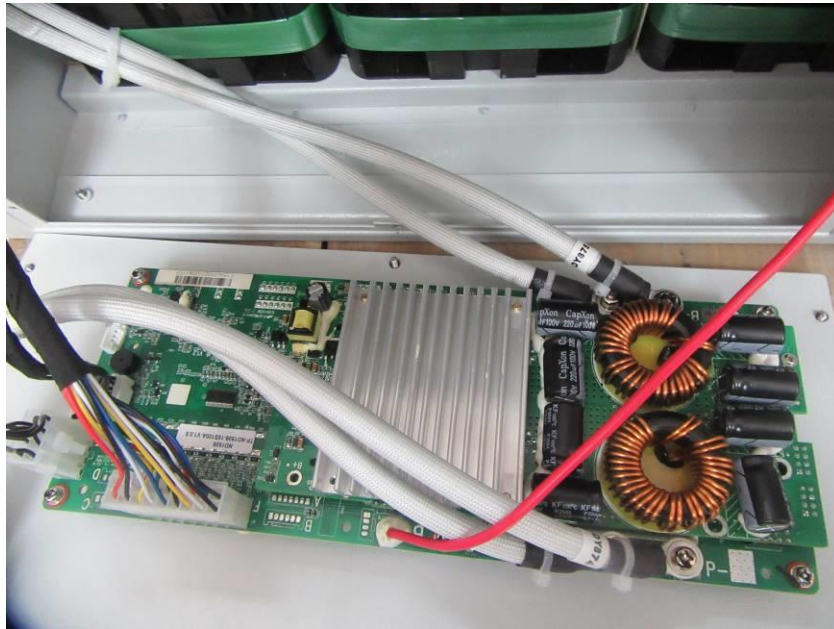
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