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Shenzhen Branch**

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Report No.: SZEM180100028101
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TEST REPORT

Application No.: SZEM1801000281BA

Applicant:

Address of Applicant:

Manufacturer / Factory:

**Address of Manufacturer /
Factory:**

Equipment Under Test (EUT):

EUT Name: POWER BANK
Model No.: P61
Trade mark: hame
Standard(s) : EN 55032:2015
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 55024:2010 +A1:2015

Date of Receipt: 2018-01-10

Date of Test: 2018-01-11 to 2018-01-16

Date of Issue: 2018-01-30

Test Result:	Pass*
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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.



Keny Xu

EMC Laboratory 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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Shenzhen Branch

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-01-30		Original

Authorized for issue by:				
				
		Foray Chen /Project Engineer		
				
		Eric Fu /Reviewer		



2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	EN 55032:2015	EN 55032:2015	Class B	Pass
Radiated Emissions (30MHz-1GHz)	EN 55032:2015	EN 55032:2015	Class B	Pass
Harmonic Current Emission	EN 61000-3-2:2014	EN 61000-3-2:2014	Class A	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	EN 61000-3-3:2013	Clause 5 of EN 61000-3-3	Pass

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 55024:2010 +A1:2015	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz)	EN 55024:2010 +A1:2015	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical Fast Transients/Burst at Power Port	EN 55024:2010 +A1:2015	EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Surge at Power Port	EN 55024:2010 +A1:2015	EN 61000-4-5:2014	1.2/50µs Tr/Td 1kV Line to Line 2kV Line to Ground	Pass
Conducted Immunity at Power Port (150kHz-80MHz)	EN 55024:2010 +A1:2015	EN 61000-4-6:2014	3Vrms (emf), 80%, 1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions	EN 55024:2010 +A1:2015	EN 61000-4-11:2004	0 % UT for 0.5per 0 % UT for 250per 70 % UT for 25per UT is Supply Voltage	Pass

InternalSource	UpperFrequency
Below 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5 times the highest frequency or 6 GHz, whichever is less



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4 General Information

4.1 Details of E.U.T.

Power supply:	Micro USB input: DC5V 2.1A Type-C input: DC5V 3A USB output 1: DC5V 2.4A USB output 2: DC5V 1.5A Type-C output: DC5V 3A Total output: DC5V 3A max Rechargeable battery: DC3.7V 6000mAh 22.2Wh
Cable:	USB cable: 20cm unshielded

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Apple	A1357 W010A051	REF. No.SEA0500
Load Resistor	SGS	N/A	REF. No.SEA0600
USB Cable	PHILIPS	SWR2101	REF. No.SEA0700

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction emission	3.0dB (150kHz to 30MHz)
2	Radiated emission	4.5dB (30MHz-1GHz)
3	Radiated Immunity	1.64dB
4	Conducted Immunity	0.96dB
5	ESD	6 %
6	EFT (Electrical Fast Transients)	5 %
7	Surge Immunity	5 %
8	Voltage Dips and Interruptions	4 %
9	Temperature test	1 °C
10	Humidity test	3%



4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 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.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: Monitored the display and output voltage of the EUT

Audio: None



5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	GB-88	SEM001-06	2017-05-10	2018-05-09
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2017-07-13	2018-07-12
LISN	Rohde & Schwarz	ENV216	SEM007-01	2017-09-27	2018-09-26
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-13
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2017-04-14	2018-04-13

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2017-07-13	2018-07-12
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2017-09-27	2018-09-26
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2017-04-14	2018-04-13

Voltage Fluctuations and Flicker					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
AC Power Source	California Instruments	5001ix	SEM016-02	2017-04-14	2018-04-13
Power Analyzer	California Instruments	PACS-1	SEM016-01	2017-04-14	2018-04-13
Measurement Software	California Instruments	CTS 3.0 V3.2.0.6	N/A	N/A	N/A

Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
ESD Ground Plane	SGS(3m*3m)	N/A	SEN006-01	N/A	N/A
ESD Generator	TESEQ AG	NSG 437	SEM019-02	2017-06-08	2018-06-07



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Radiated Immunity (80MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	2015-05-13	2018-05-12
Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SMB100A	SEM006-11	2017-04-14	2018-04-13
Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	2017-09-27	2018-09-26
Broadband Amplifier (800MHz-3GHz)	Rohde & Schwarz	BBA150	EMC2092	2018-01-08	2019-01-07
Broadband Amplifier (2.5GHz-6GHz)	Rohde & Schwarz	BBA150-E60	SEM005-16	2017-07-17	2018-07-16
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	2017-04-14	2018-04-13
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-08	2017-04-14	2018-04-13
Stacked Log.-Per.-Broadband Antenna (70MHz-10GHz)	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A

Electrical Fast Transients/Burst at Power Port					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Ultra Compact Simulator	EM TEST	UCS 500N7	SEM018-02	2017-07-17	2018-07-16
Measurement Software	EM TEST	IEC CONTROL V6.0.1	N/A	N/A	N/A

Surge at Power Port					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Ultra Compact Simulator	EM TEST	UCS 500N7	SEM018-02	2017-07-17	2018-07-16
Measurement Software	EM TEST	IEC CONTROL V6.0.1	N/A	N/A	N/A

Conducted Immunity at Power Port (150kHz-80MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	AUDIX	N/A	SEM001-08	2017-05-10	2018-05-10
RF-Generator	SCHAFFNER	NSG 2070	SEM006-01	2017-09-27	2018-09-26
Coupling/Decoupling Network	SCHAFFNER	CDN M016	SEM007-03	2017-07-17	2018-07-16

Voltage Dips and Interruptions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Ultra Compact Simulator	EM TEST	UCS 500N7	SEM018-02	2017-07-17	2018-07-16
Measurement Software	EM TEST	IEC CONTROL V6.0.1	N/A	N/A	N/A

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General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-17

6 Emission Test Results

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

Test Requirement:	EN 55032:2015
Test Method:	EN 55032:2015
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

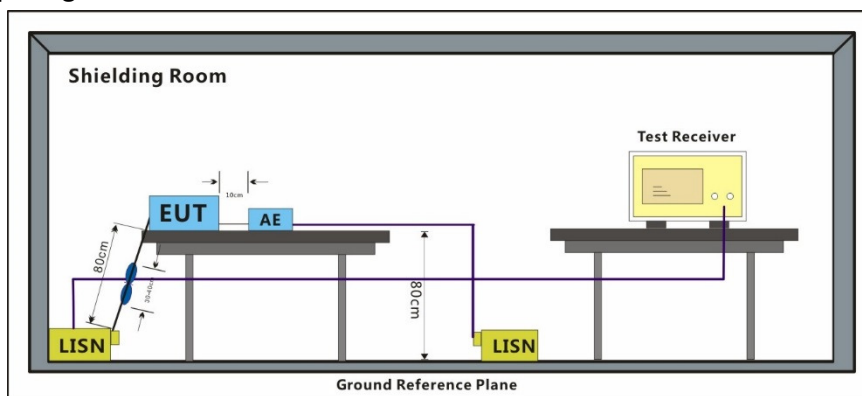
Operating Environment:

Temperature: 22.2 °C Humidity: 25.8 % RH Atmospheric Pressure: 1020 mbar

- Pretest these mode to find the worst case:
- a: Micro USB charge mode, keep EUT being charged with adapter.
 - b: Type-C charge mode, keep EUT being charged with adapter.
 - d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
 - e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
 - f: Idle mode.

The worst case for final test: d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.

6.1.2 Test Setup Diagram

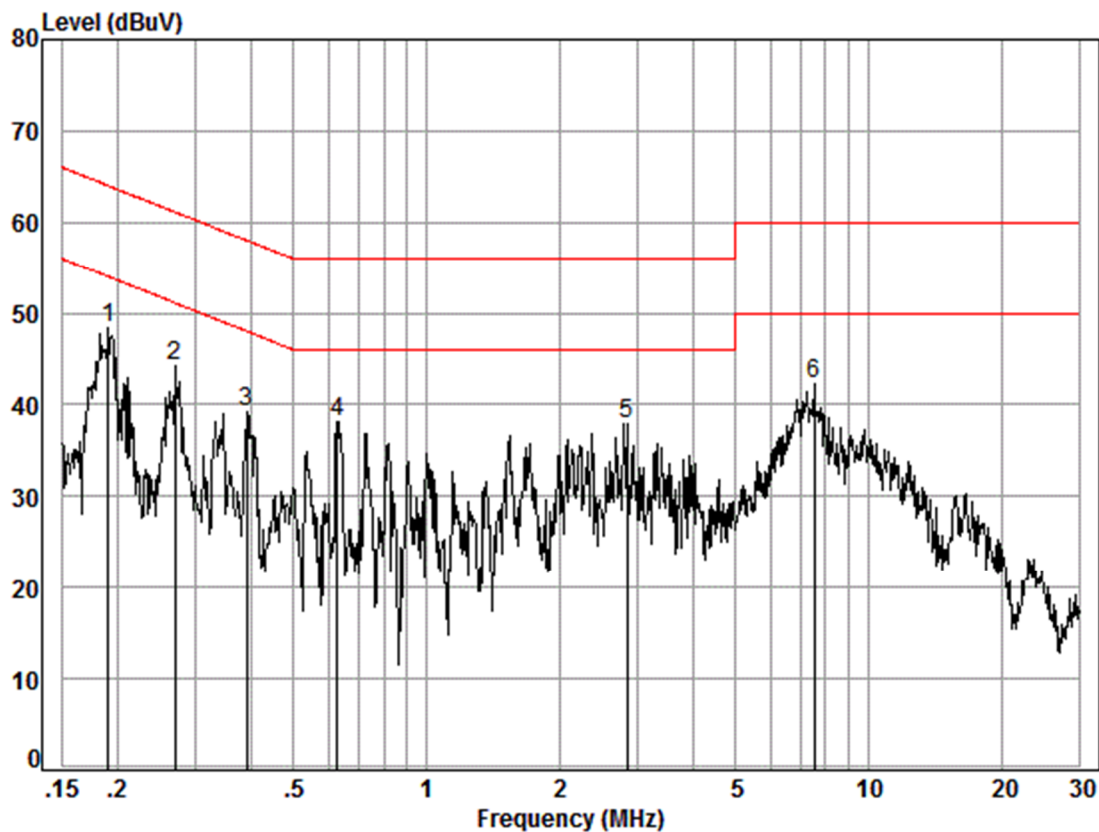


6.1.3 Measurement Data

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.



Mode:d; Line:Live Line

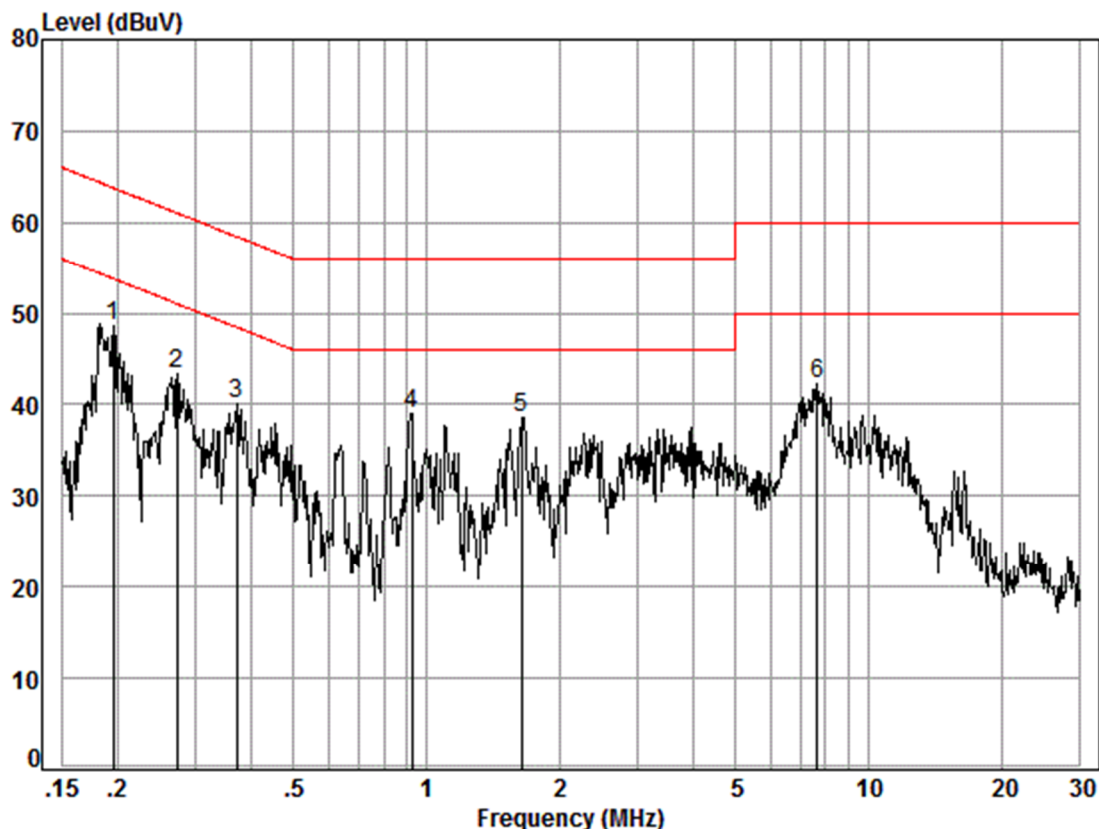


Site : Shielding Room
Condition: Line
Job No. : 00281BA
Test mode: d

	Freq	Cable	LISN	Read	Limit	Over	
	MHz	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1	0.19	0.02	9.51	38.93	48.46	54.02	-5.56 Peak
2	0.27	0.01	9.51	34.65	44.17	51.12	-6.95 Peak
3	0.39	0.01	9.49	29.76	39.26	48.03	-8.77 Peak
4	0.63	0.02	9.52	28.71	38.25	46.00	-7.75 Peak
5	2.84	0.02	9.54	28.31	37.87	46.00	-8.13 Peak
6	7.53	0.01	9.60	32.74	42.35	50.00	-7.65 Peak



Mode:d; Line:Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 00281BA
Test mode: d

	Freq	Cable	LISN	Read	Limit	Over	
	MHz	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1	0.20	0.02	9.57	39.06	48.65	53.80	-5.15 Peak
2	0.27	0.01	9.58	33.83	43.42	51.03	-7.61 Peak
3	0.37	0.01	9.58	30.55	40.14	48.47	-8.33 Peak
4	0.93	0.02	9.62	29.38	39.02	46.00	-6.98 Peak
5	1.64	0.02	9.64	28.88	38.54	46.00	-7.46 Peak
6	7.65	0.01	9.73	32.64	42.38	50.00	-7.62 Peak

6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	EN 55032:2015
Test Method:	EN 55032:2015
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	
30MHz-230MHz	40 dB(μ V/m) quasi-peak
230MHz-1GHz	47 dB(μ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

6.2.1 E.U.T. Operation

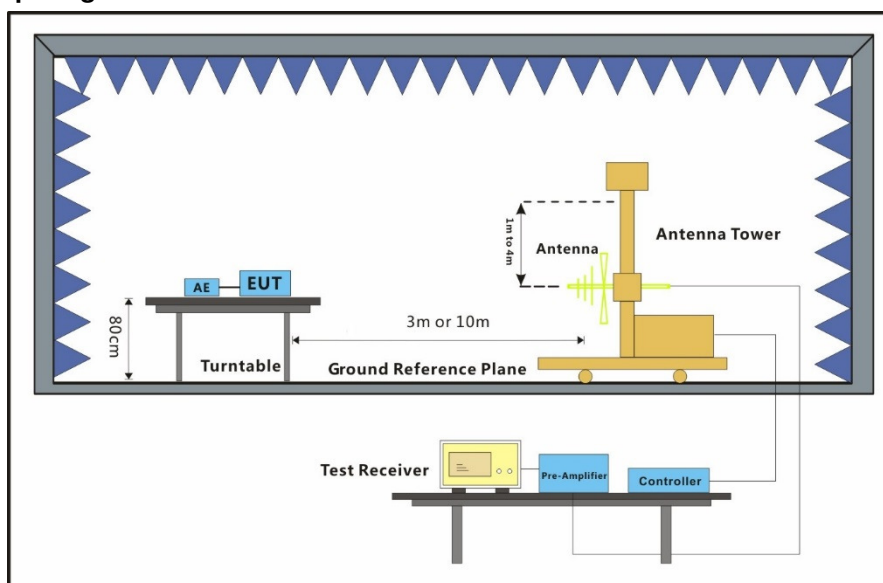
Operating Environment:

Temperature: 19.2 °C Humidity: 35 % RH Atmospheric Pressure: 1020 mbar

- Pretest these mode to find the worst case:
- a: Micro USB charge mode, keep EUT being charged with adapter.
 - b: Type-C charge mode, keep EUT being charged with adapter.
 - c: Discharge mode, keep EUT working with full load.
 - d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
 - e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
 - f: Idle mode.

The worst case for final test: d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.

6.2.2 Test Setup Diagram

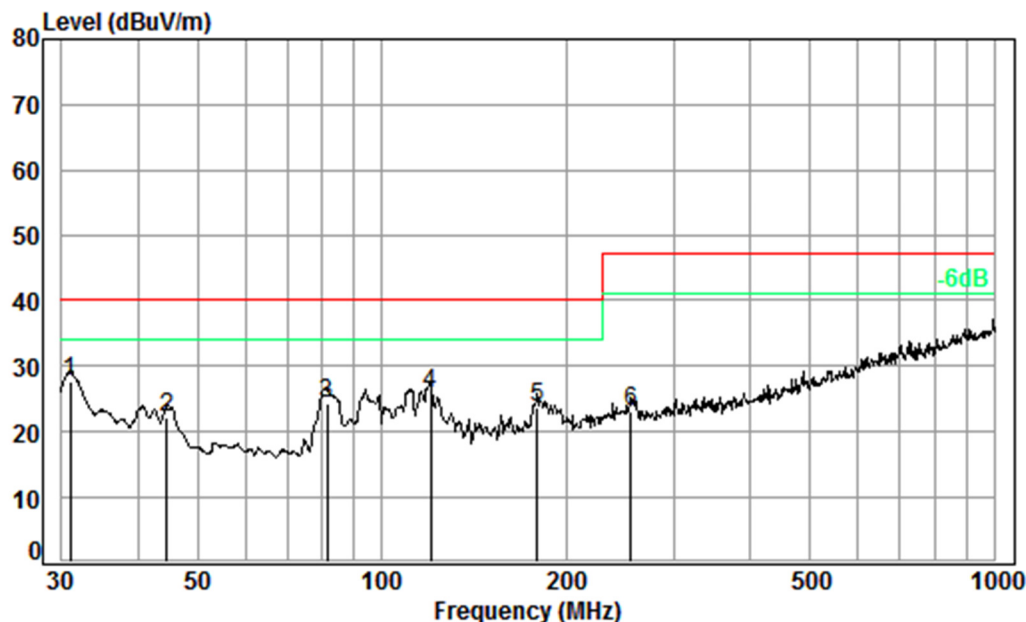


6.2.3 Measurement Data

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.



Mode:d; Polarization:Horizontal



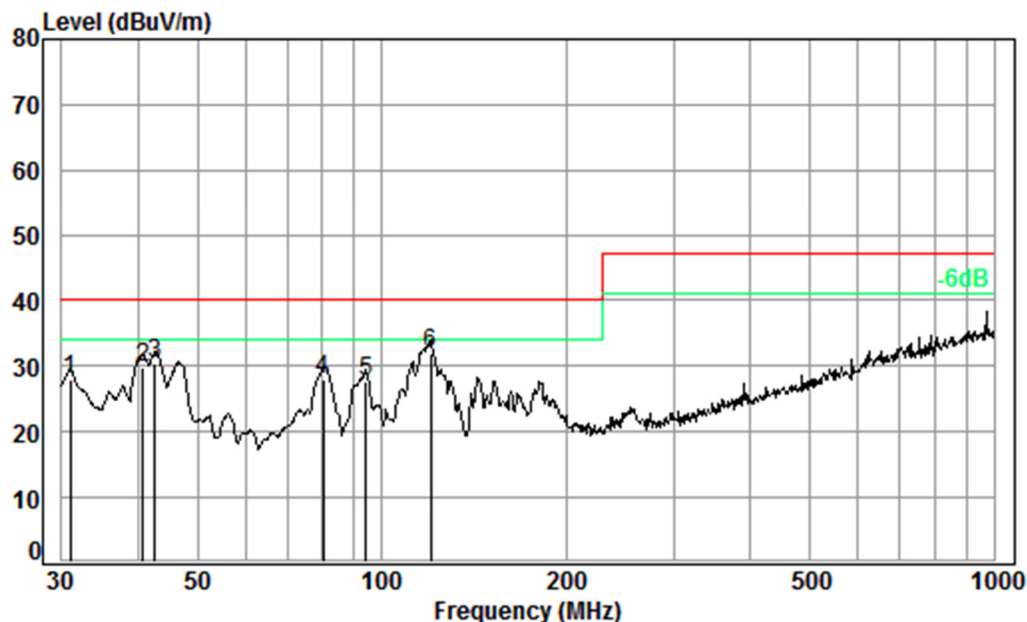
Condition: 3m HORIZONTAL

Job No. : 00281BA

Test Mode: d

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	30.96	0.60	21.95	27.35	32.37	27.57	40.00	-12.43
2	44.59	0.70	15.89	27.31	32.82	22.10	40.00	-17.90
3	81.50	1.10	12.17	27.23	38.35	24.39	40.00	-15.61
4	120.28	1.25	13.11	27.07	38.42	25.71	40.00	-14.29
5	179.39	1.37	15.89	26.78	33.25	23.73	40.00	-16.27
6	255.62	1.70	19.04	26.52	28.97	23.19	47.00	-23.81

Mode:d; Polarization:Vertical



Condition: 3m VERTICAL

Job No. : 00281BA

Test Mode: d

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.96	0.60	21.95	27.35	32.74	27.94	40.00	-12.06
2	40.70	0.62	17.24	27.32	39.23	29.77	40.00	-10.23
3	42.60	0.66	16.57	27.31	40.45	30.37	40.00	-9.63
4	80.36	1.10	12.04	27.23	42.15	28.06	40.00	-11.94
5	94.10	1.14	13.48	27.21	40.14	27.55	40.00	-12.45
6 pp	120.28	1.25	13.11	27.07	44.73	32.02	40.00	-7.98



6.3 Harmonic Current Emission

Test Requirement: EN 61000-3-2:2014

Test Method: EN 61000-3-2:2014

Frequency Range: 100Hz to 2kHz

There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN 61000-3-2:2014.

For further details, please refer to Clause 7 of EN 61000-3-2 which states:

"For the following categories of equipment, limits are not specified in this standard.- equipment with a rated power of 75W or less, other than lighting equipment."

6.4 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013

Test Method: EN 61000-3-3:2013

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 20.5 °C Humidity: 26.3 % RH Atmospheric Pressure: 1020 mbar

Pretest these mode to find the worst case: a: Micro USB charge mode, keep EUT being charged with adapter.

b: Type-C charge mode, keep EUT being charged with adapter.

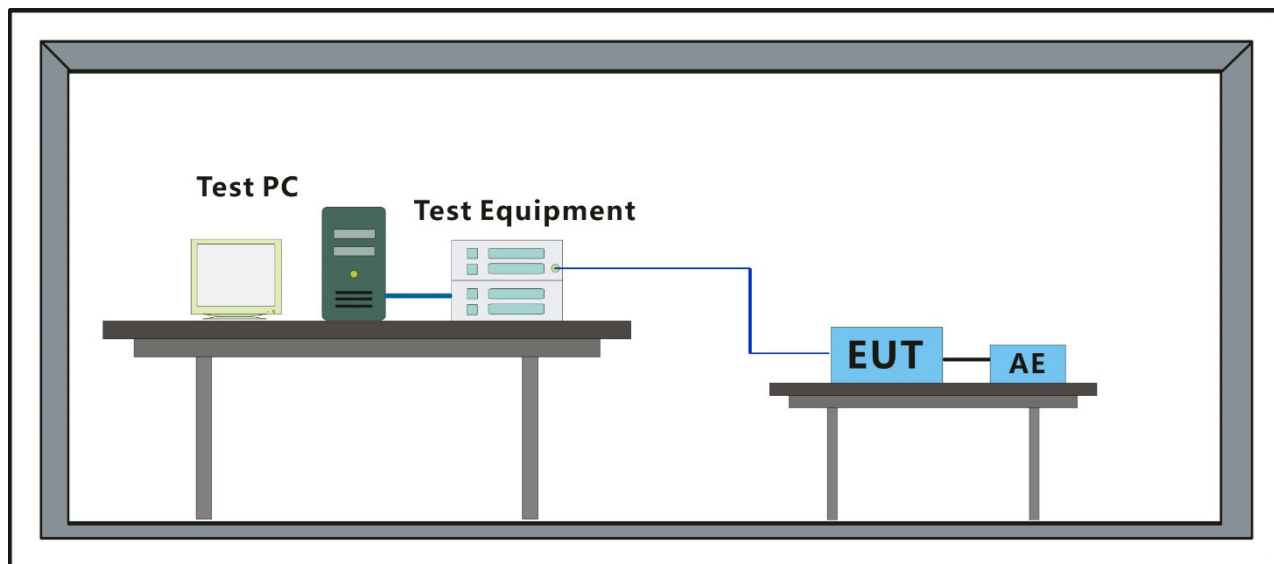
d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.

e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.

f: Idle mode.

The worst case for final test: e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.

6.4.2 Test Setup Diagram



6.4.3 Measurement Data



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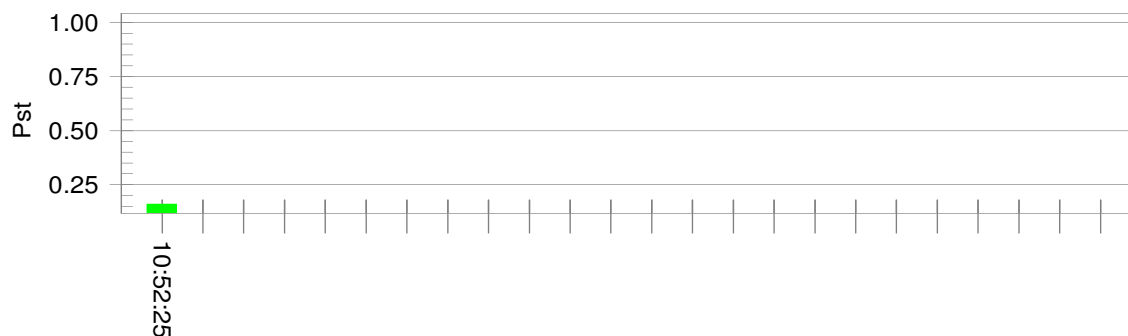
Mode:e

Test Result: Pass

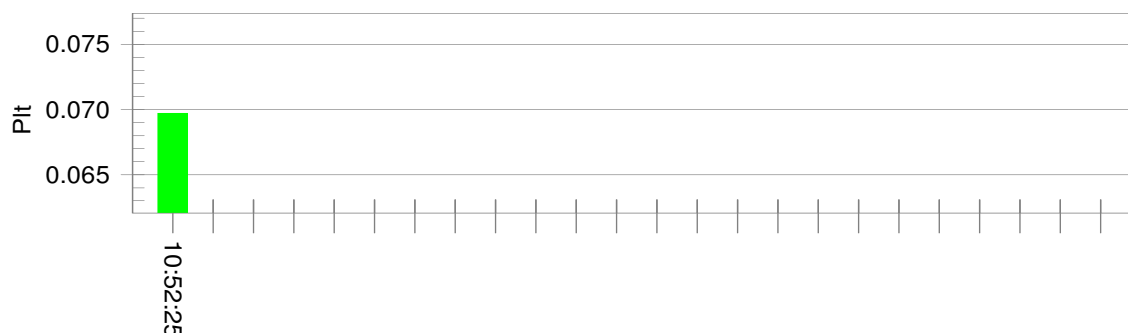
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.00

Highest dt (%): 0.13

Time(mS) > dt: 0.0

Highest dc (%): 0.00

Highest dmax (%): 0.04

Highest Pst (10 min. period): 0.160

Test limit (%): 3.30 Pass

Test limit (mS): 500.0 Pass

Test limit (%): 3.30 Pass

Test limit (%): 4.00 Pass

Test limit: 1.000 Pass



7 Immunity Test Results

7.1 Performance Criteria Description in EN 55024:2010 +A1:2015

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.

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.

Criterion C

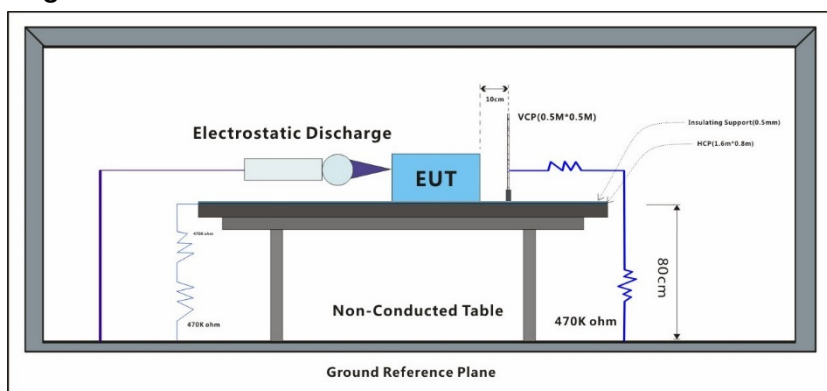
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

7.2 Electrostatic Discharge

Test Requirement:	EN 55024:2010 +A1:2015
Test Method:	EN 61000-4-2:2009
Performance Criterion:	B
Discharge Impedance:	330Ω/150pF
Number of Discharge:	Minimum of four test points (a minimum of 50 discharges at each 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: 20 °C Humidity: 48.4 % RH Atmospheric Pressure: 1020 mbar

- Test mode:
- a: Micro USB charge mode, keep EUT being charged with adapter.
 - b: Type-C charge mode, keep EUT being charged with adapter.
 - c: Discharge mode, keep EUT working with full load.
 - d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
 - e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
 - f: Idle mode.



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	B
Contact Discharge	4	-	2	B
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

Results:

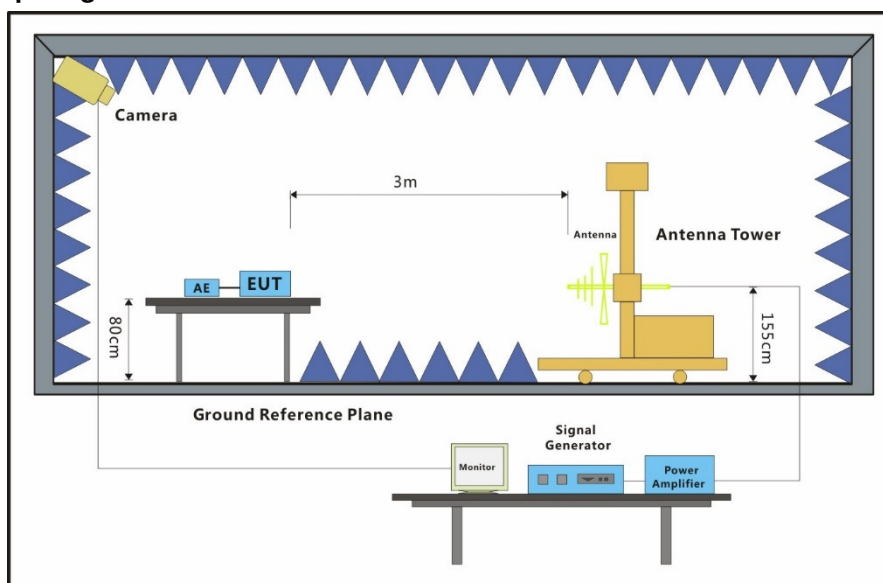
A: No degradation in the performance of the EUT was observed.

B: The voltage fluctuate when testing on the metallic shell of USB ports, but it can recover automatically.

7.3 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 55024:2010 +A1:2015
Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
Performance Criterion: A
Frequency Range: 80MHz to 1GHz
Antenna Polarisation: Vertical and Horizontal
Modulation: 1kHz,80% Amp. Mod,1% increment

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 58 % RH Atmospheric Pressure: 1020 mbar

Test mode:

- a: Micro USB charge mode, keep EUT being charged with adapter.
- b: Type-C charge mode, keep EUT being charged with adapter.
- c: Discharge mode, keep EUT working with full load.
- d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
- e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
- f: Idle mode.

7.3.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A

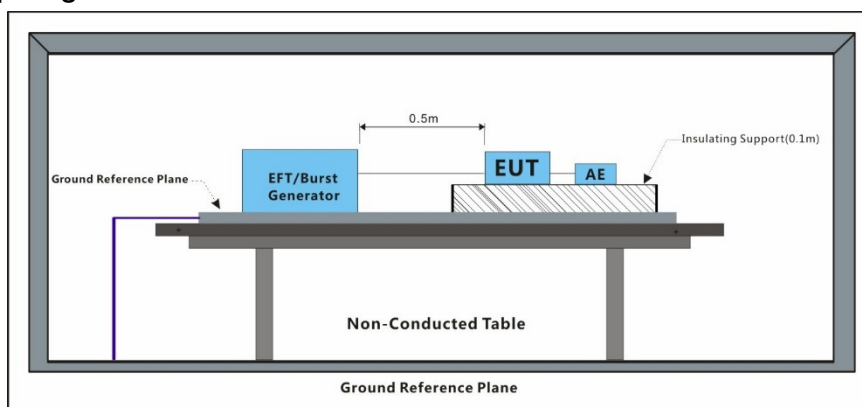
Results:

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

7.4 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 55024:2010 +A1:2015
 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: 20.5 °C Humidity: 26.4 % RH Atmospheric Pressure: 1020 mbar

Test mode:

- a: Micro USB charge mode, keep EUT being charged with adapter.
- b: Type-C charge mode, keep EUT being charged with adapter.
- d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
- e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
- f: Idle mode.

7.4.3 Test Results:

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

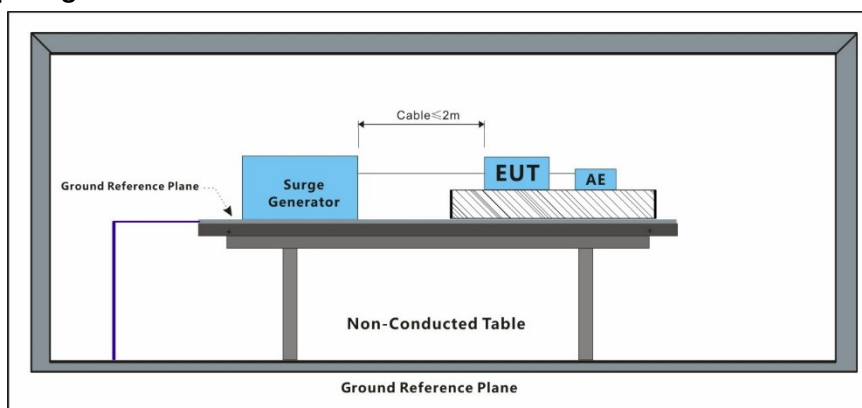
Results:

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

7.5 Surge at Power Port

Test Requirement: EN 55024:2010 +A1:2015
Test Method: EN 61000-4-5:2014
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: 20.5 °C Humidity: 26.4 % RH Atmospheric Pressure: 1020 mbar

Test mode:

- a: Micro USB charge mode, keep EUT being charged with adapter.
- b: Type-C charge mode, keep EUT being charged with adapter.
- d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
- e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
- f: Idle mode.

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

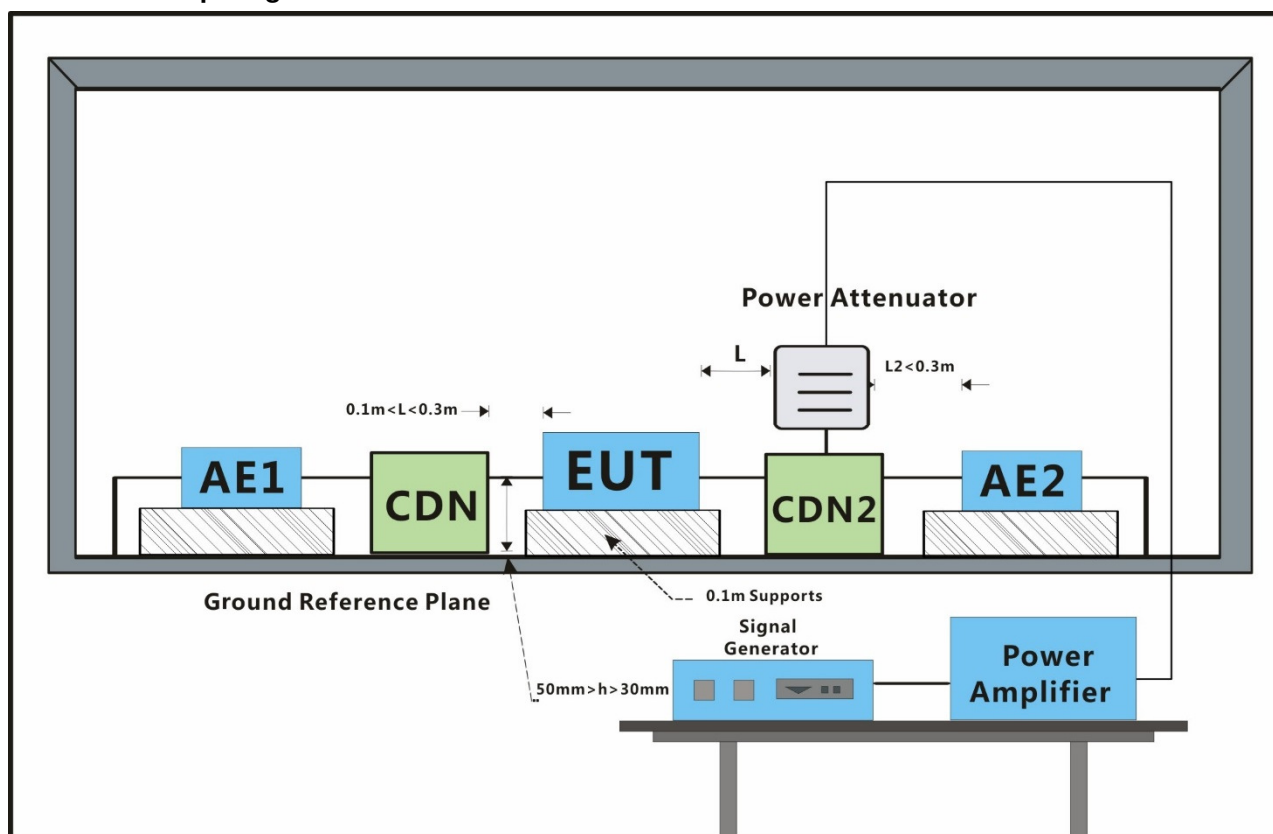
Results:

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

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

Test Requirement: EN 55024:2010 +A1:2015
 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: 20.5 °C Humidity: 26.4 % RH Atmospheric Pressure: 1020 mbar

Test mode:

- a: Micro USB charge mode, keep EUT being charged with adapter.
- b: Type-C charge mode, keep EUT being charged with adapter.
- d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
- e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
- f: Idle mode.

7.6.3 Test Results:

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CDN	2s	A

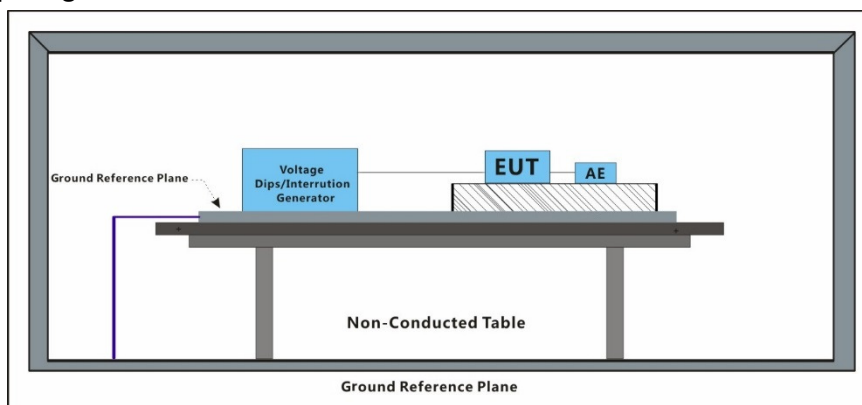
Results:

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

7.7 Voltage Dips and Interruptions

Test Requirement: EN 55024:2010 +A1:2015
Test Method: EN 61000-4-11:2004
Performance Criterion: 0% of UT (Supply Voltage) for 0.5 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

7.7.1 Test Setup Diagram



7.7.2 E.U.T. Operation

Operating Environment:

Temperature: 20.5 °C Humidity: 26.3 % RH Atmospheric Pressure: 1020 mbar

Test mode:

- a: Micro USB charge mode, keep EUT being charged with adapter.
- b: Type-C charge mode, keep EUT being charged with adapter.
- d: Micro USB charge and discharge mode, keep EUT being charged with adapter and working with full load.
- e: Type-C charge and discharge mode, keep EUT being charged with adapter and working with full load.
- f: Idle mode.

7.7.3 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°	250 Cycles	3	C
0	180°	250 Cycles	3	C
70	0°	25 Cycles	3	A
70	180°	25 Cycles	3	A

Results:

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

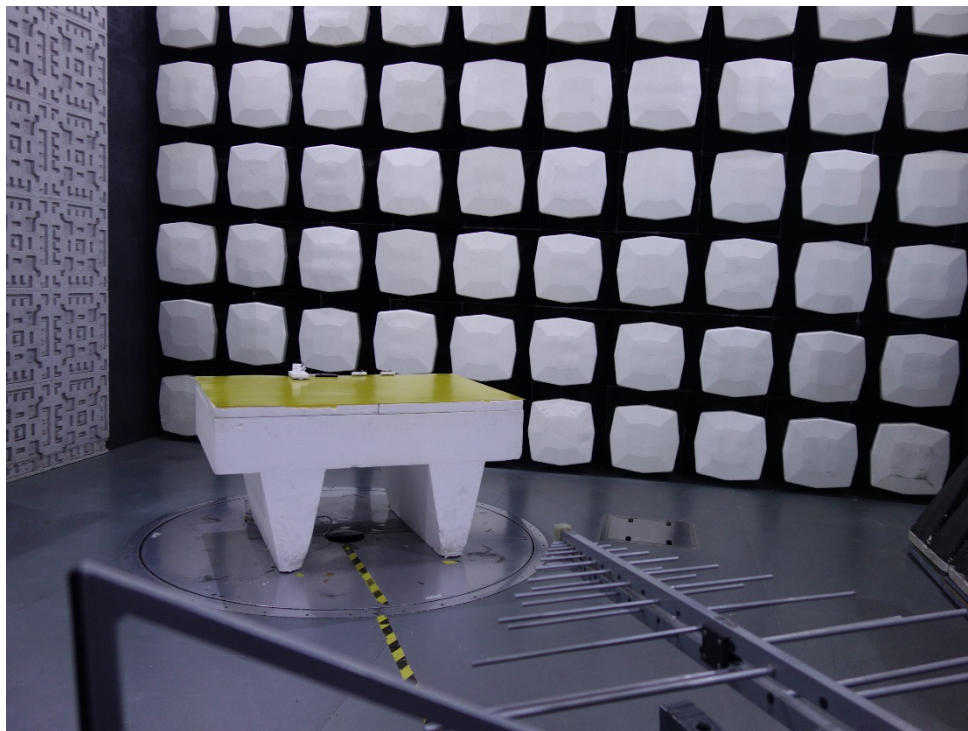
C: The EUT stops charging during the test, but can recover automatically after the test.

8 Photographs

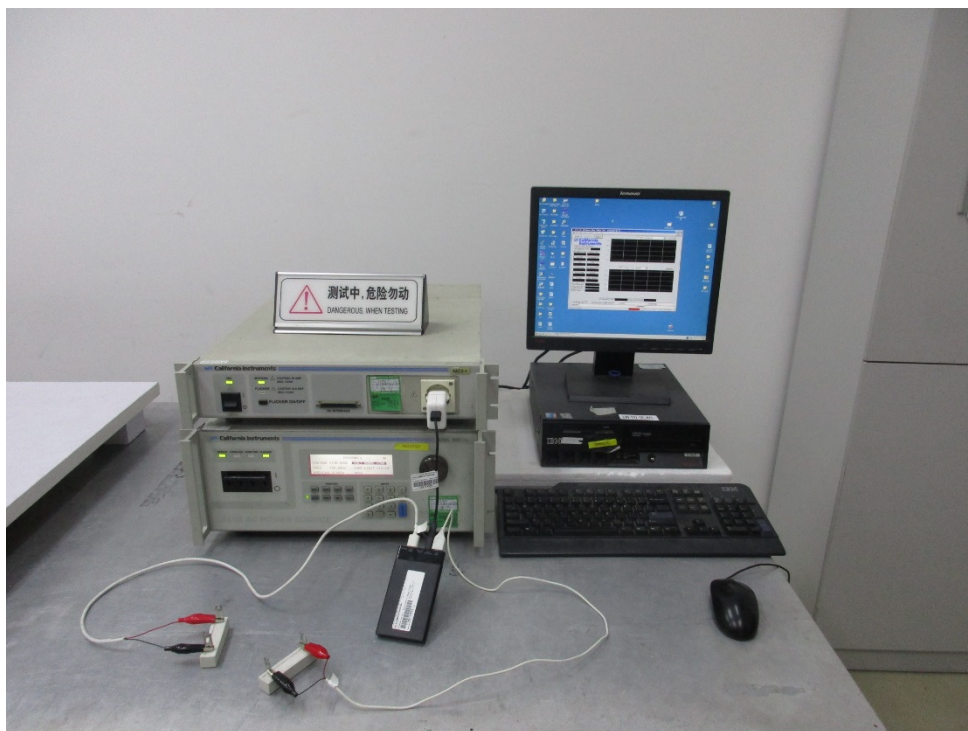
8.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup



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



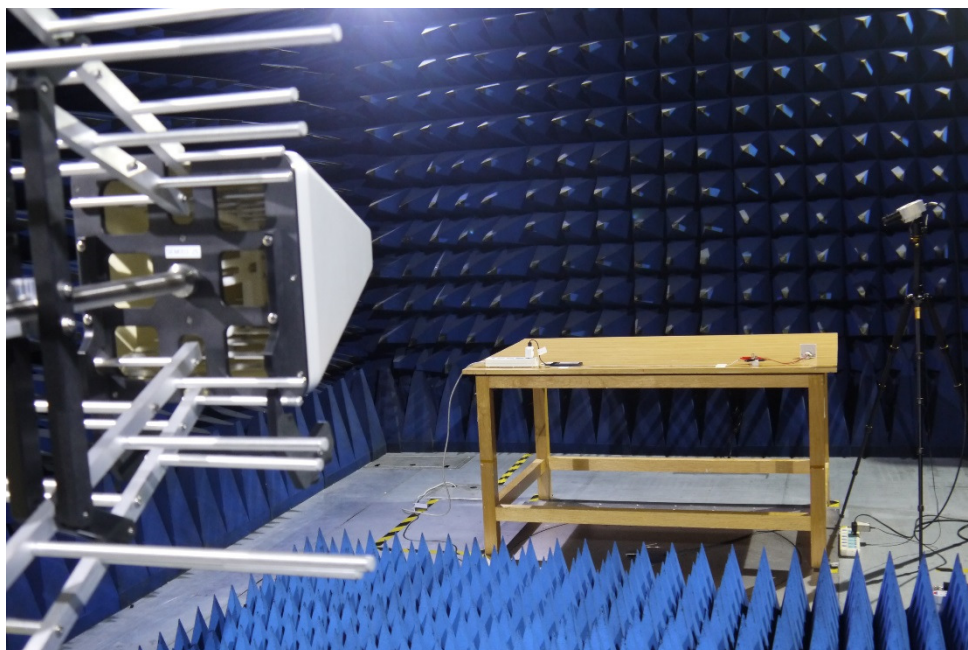
8.3 Voltage Fluctuations and Flicker Test Setup



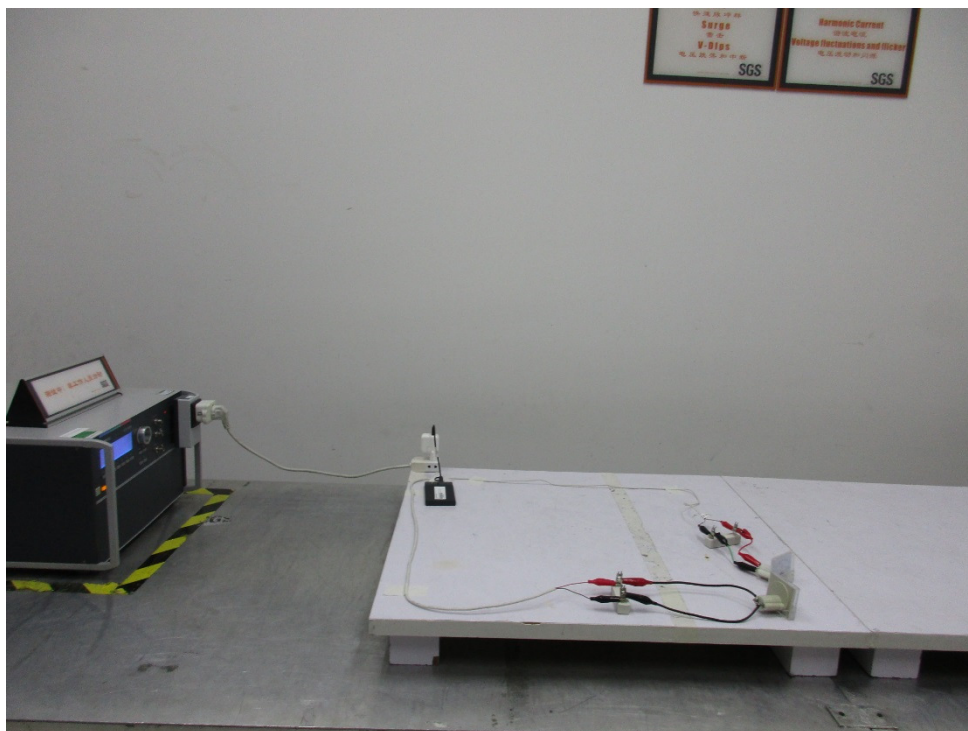
8.4 Electrostatic Discharge Test Setup



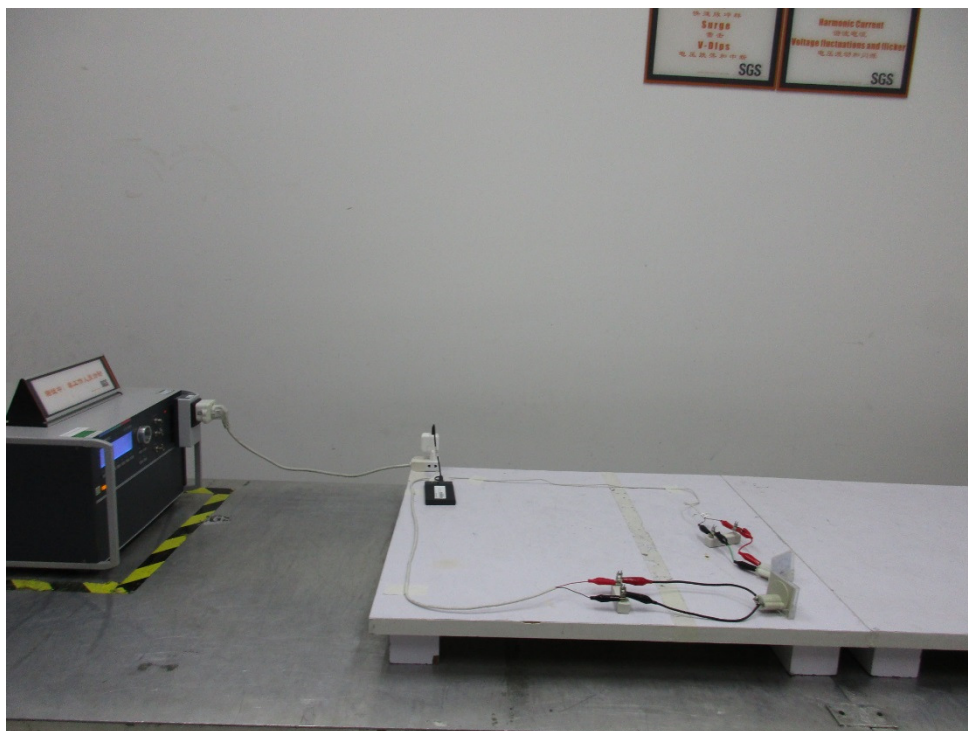
8.5 Radiated Immunity (80MHz-1GHz) Test Setup



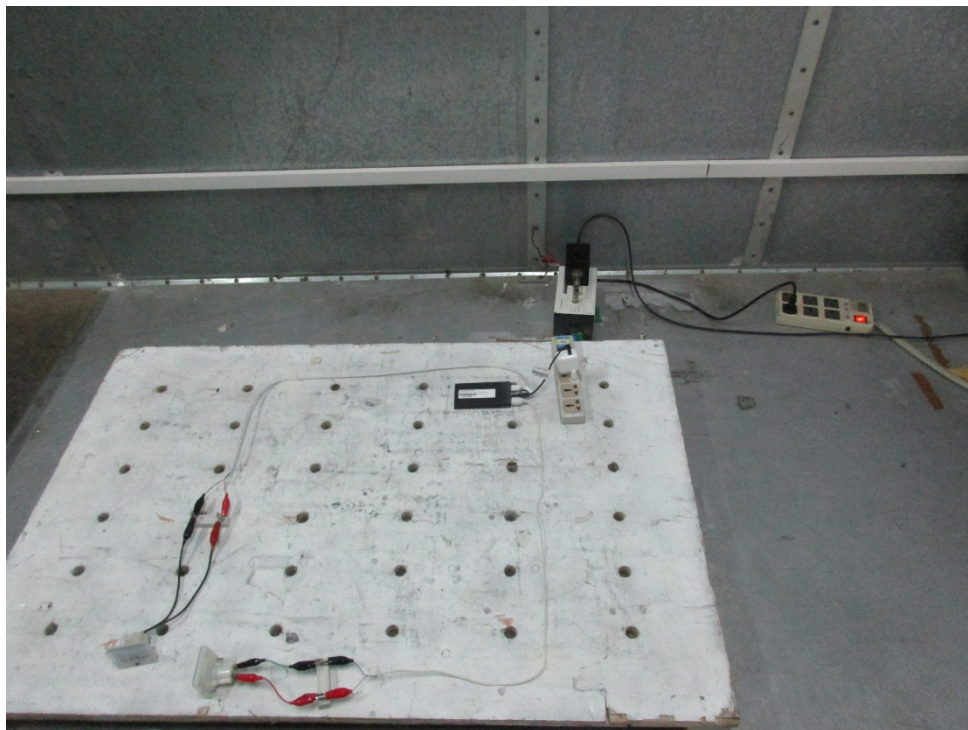
8.6 Electrical Fast Transients/Burst at Power Port Test Setup



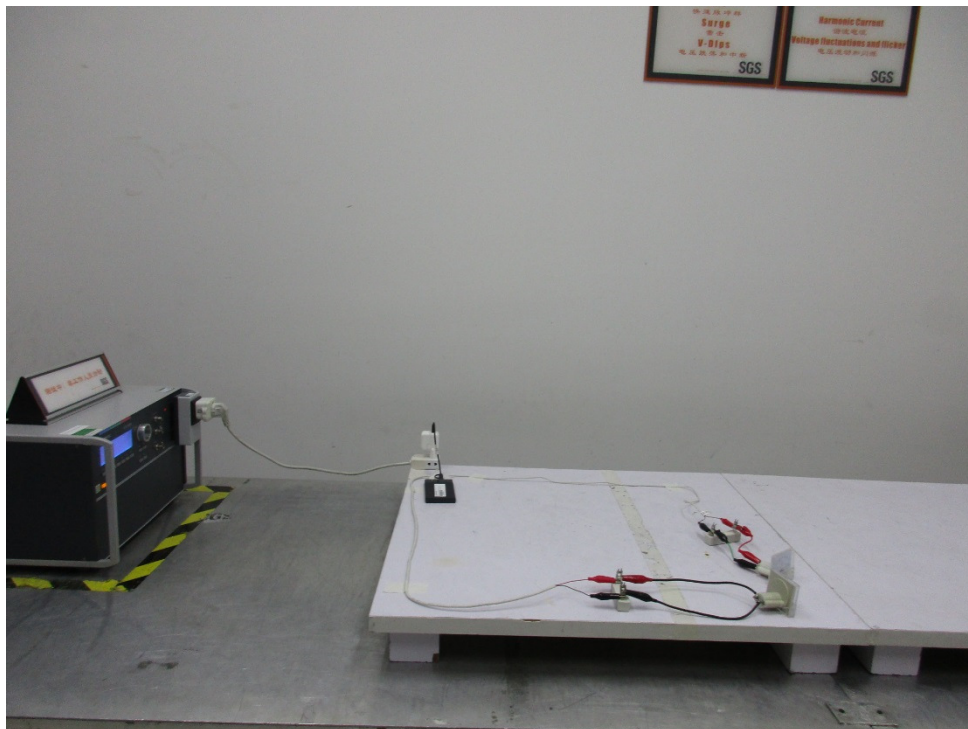
8.7 Surge at Power Port Test Setup



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

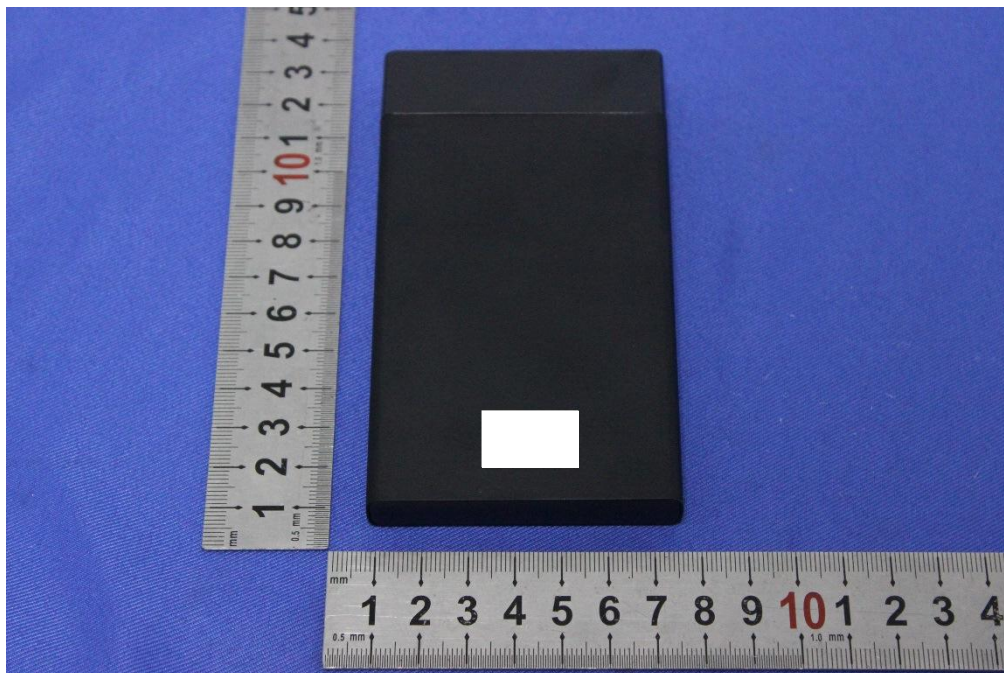


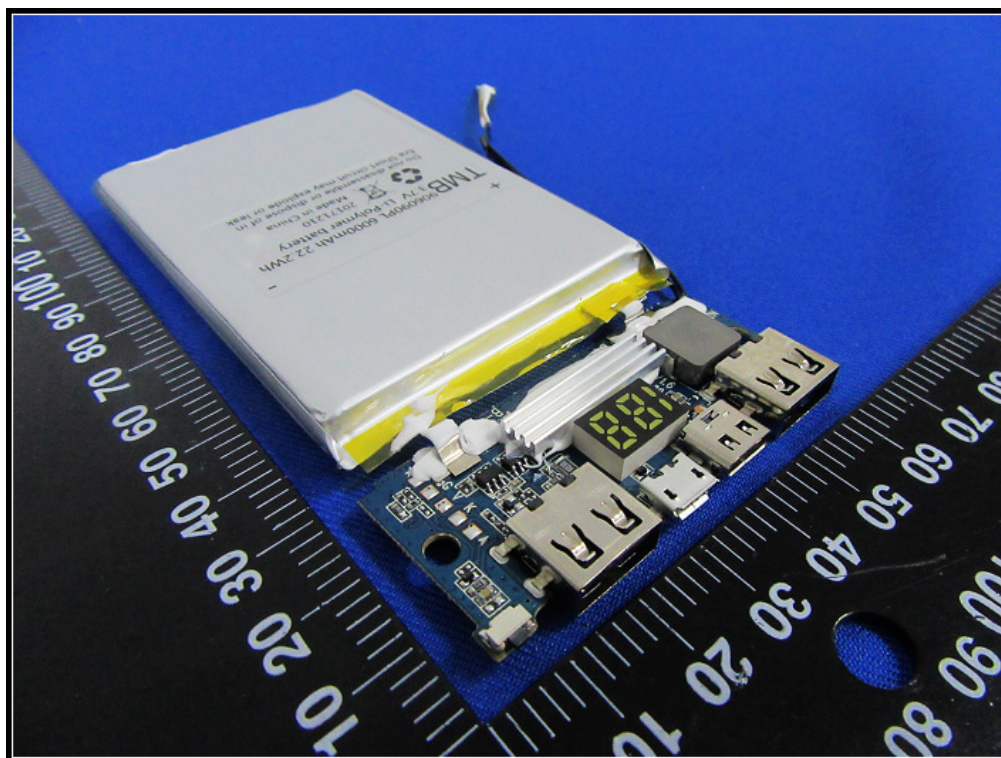
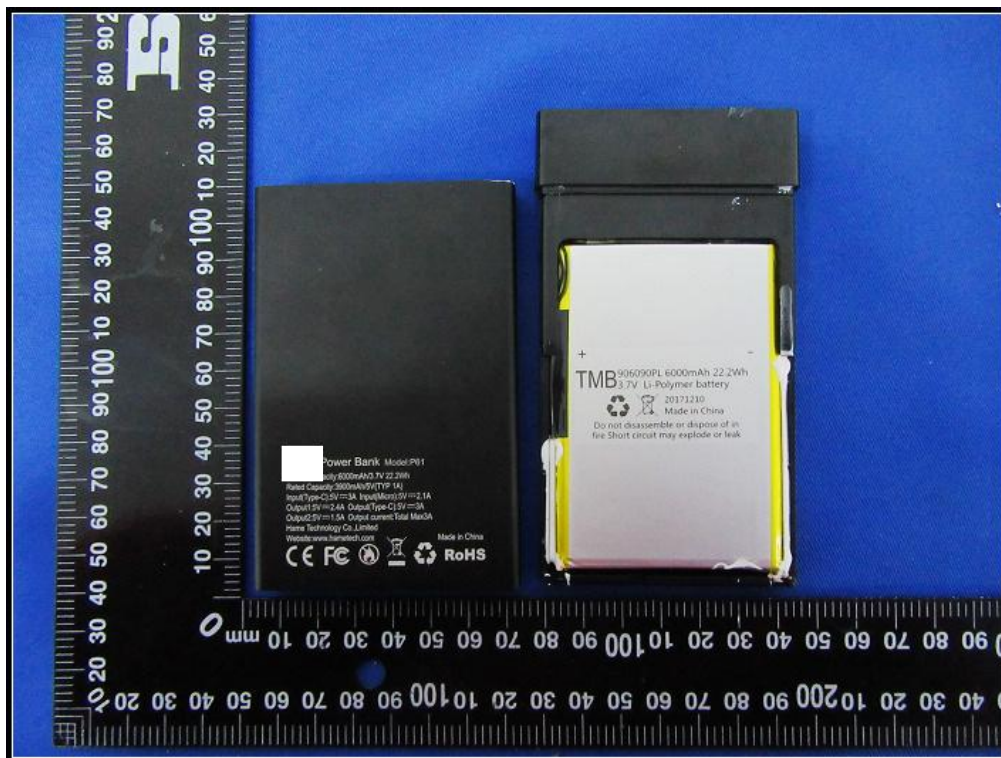
8.9 Voltage Dips and Interruptions Test Setup

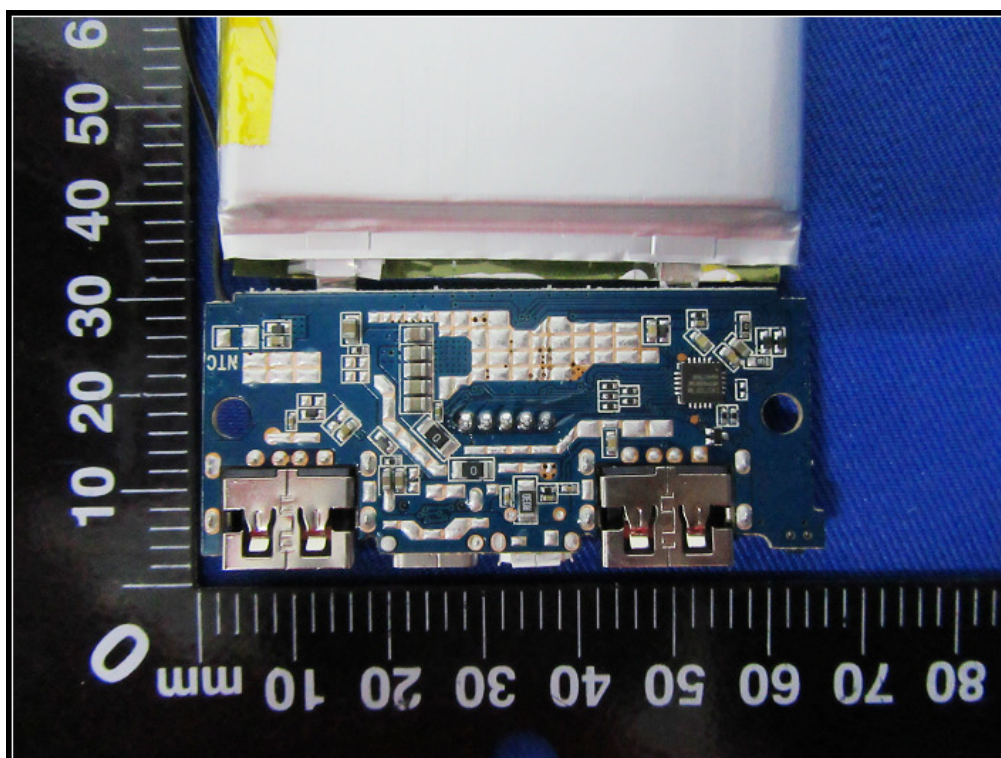
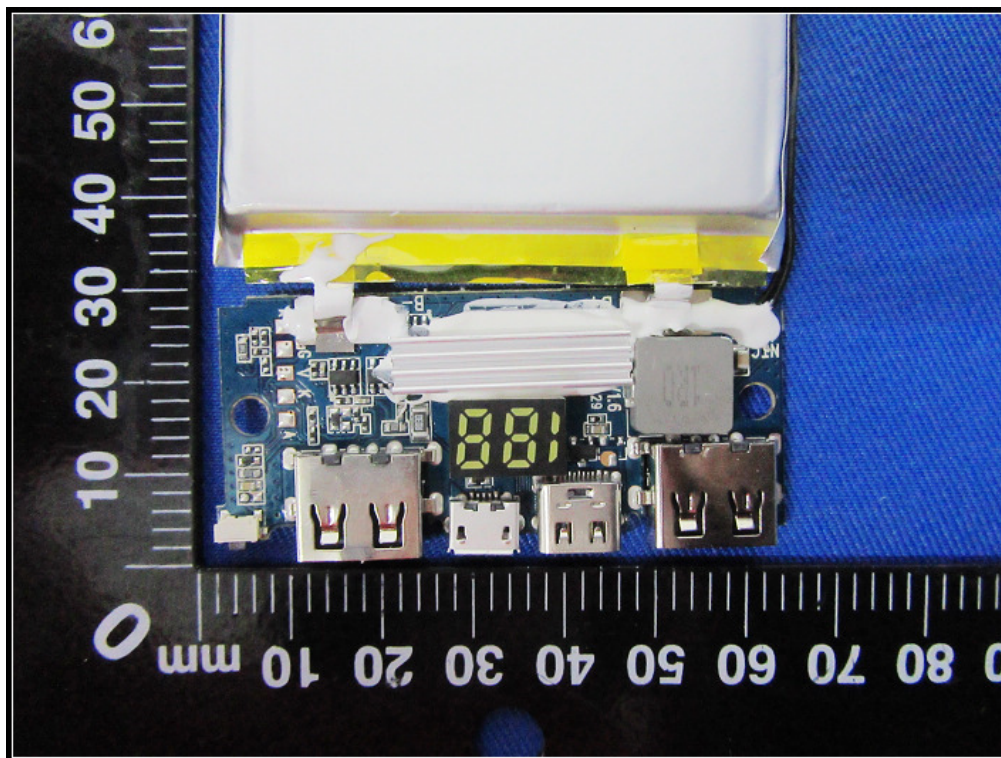


8.10 EUT Construal Details (EUT Photos)

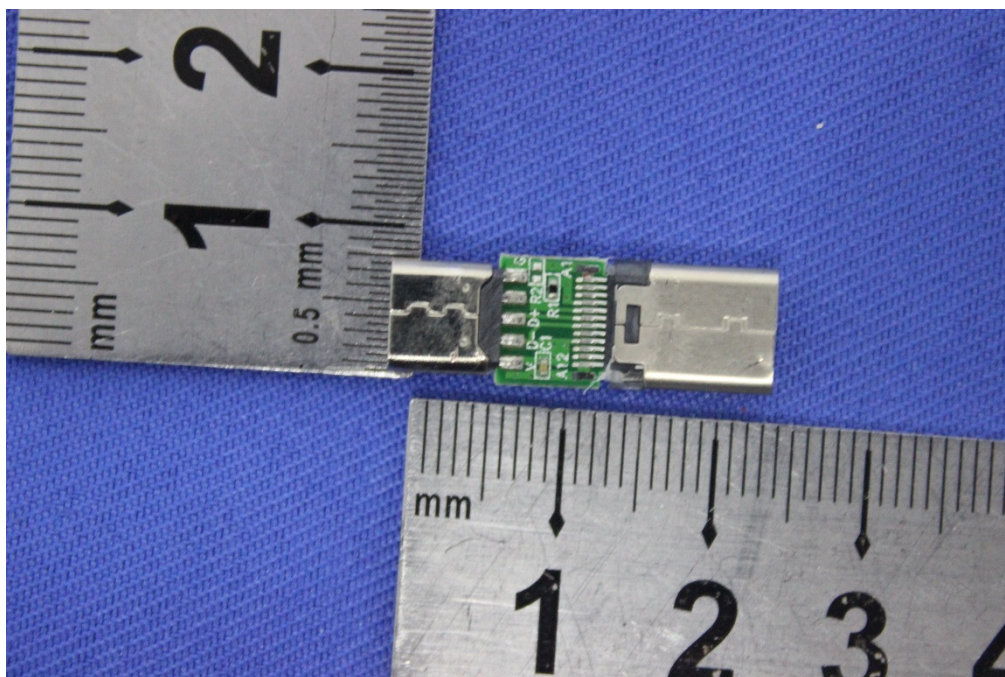


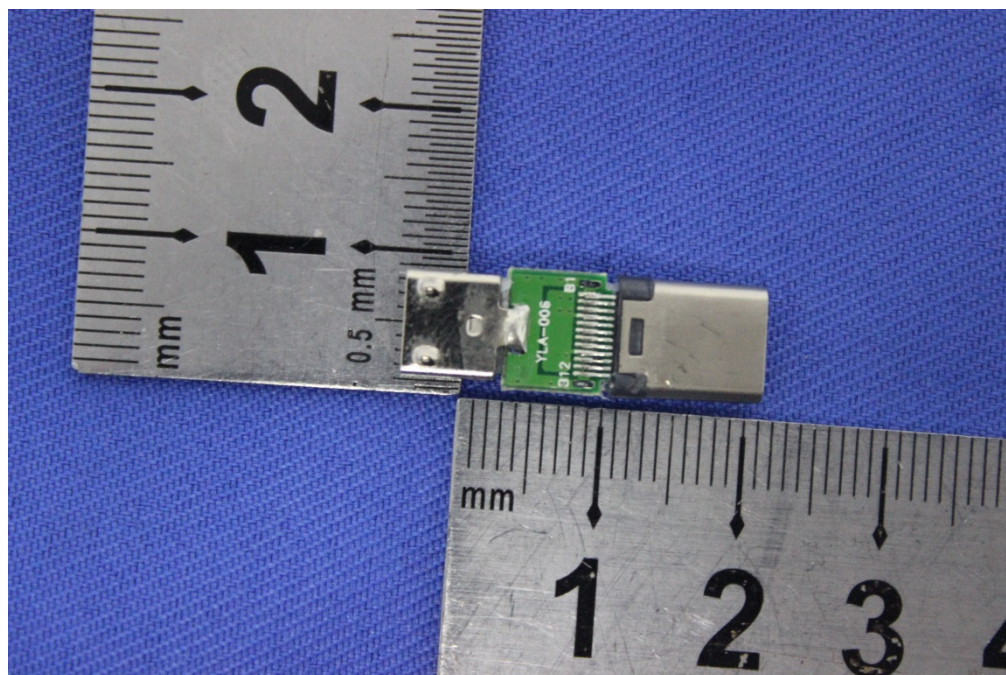












- End of the Report -