

EMC TEST REPORT



For Electromagnetic Interference of

Report Reference No.....: ATSE180608431

Date of issue.....: 2018-06-20

Testing Laboratory: ATS Electronic Technology Co., Ltd.

Address.....: 3/F, Building A, No. 1 Hedong Three Road, Jinxia Community,
Changan Town, Dongguan City, Guangdong, P.R.China

Applicant's name

Address.....

Test specification

Test item description.....: Power bank

Model/Type reference: UP-9091

Ratings.....: I/P: 5Vdc/2A
O/P: 5Vdc/3.1A

Responsible Engineer


(Rock Huang / Engineer)

Approved by




(Sheng Zeng / EMC Manager)

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1. CERTIFICATION

Testing Laboratory: ATS Electronic Technology Co., Ltd.

Address.....: 3/F, Building A, No. 1 Hedong Three Road, Jinxia Community,
Changan Town, Dongguan City, Guangdong, P.R.China

Applicant's name:

Address.....:

Manufacturer: same as applicant

Address.....: same as applicant

Factory.....: same as applicant

Address.....: same as applicant

Test specification:

Test item description.....: Power bank

Trade Mark: N/A

Model/Type reference: UP-9091

Test Sample: UP-9091

Tested Power: 5Vdc from Adapter Input 230Vac,50Hz or 5Vdc

Standards: EN 55032:2015/AC:2016

EN 55024:2010/A1:2015

The device described above was tested by ATS Electronic Technology Co., Ltd. to determine the maximum emission levels emanated from the device and severity levels of the device endure and it performance criterion. The measurement results are contained in this test report and ATS Electronic Technology Co., Ltd. assumes full responsibility for the accuracy and completeness of these measurements. This report shows the EUT is technically compliance with the above official standards. This report applies to the above sample only and shall not be reproduced in part without written approval of ATS Electronic Technology Co., Ltd.

1.1 GENERAL PRODUCT INFORMATION:**2. SUMMARY OF TEST RESULTS**

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015/AC:2016	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	
EMC Immunity (EN 55024:2010/A1:2015)				
Section	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006/A2:2010	RF electromagnetic field	A	PASS	

REMARK:

(1) "N/A" denotes test is not applicable in this Test Report

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
C01	ANSI	150 KHz ~ 30MHz	2.44	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)	NOTE
R03	ANSI	30MHz ~ 200MHz	V	3.42	
	ANSI	30MHz ~ 200MHz	H	3.52	
	ANSI	200MHz ~ 1,000MHz	V	3.52	
	ANSI	200MHz ~ 1,000MHz	H	3.54	

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Charging
	Discharge

For Conducted Test	
Final Test Mode	Description
Mode 1	Charging

For Radiated Test	
Final Test Mode	Description
Mode 1	Charging
Mode 2	Discharge

For EMS Test	
Final Test Mode	Description
Mode 1	Charging
Mode 2	Discharge

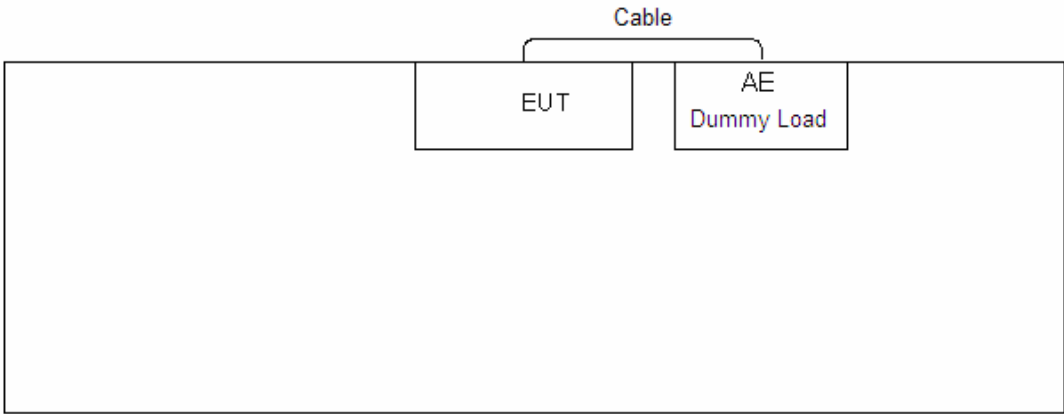


2.3 EQUIPMENT USED DURING TESTING:

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Dummy load	/	/	/
Cable	/	/	/	/

*Note: Use abbreviations:
EUT - Equipment Under Test,
AE - Auxiliary/Associated Equipment, or
SIM - Simulator (Not Subjected to Test)
CABL – Connecting cables

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	101569	11/13/2018
2	LISN	Schaffner	MN2050D	1467	11/13/2018
3	LISN	Schwarzbeck	NSLK 8127	8127-432	11/13/2018

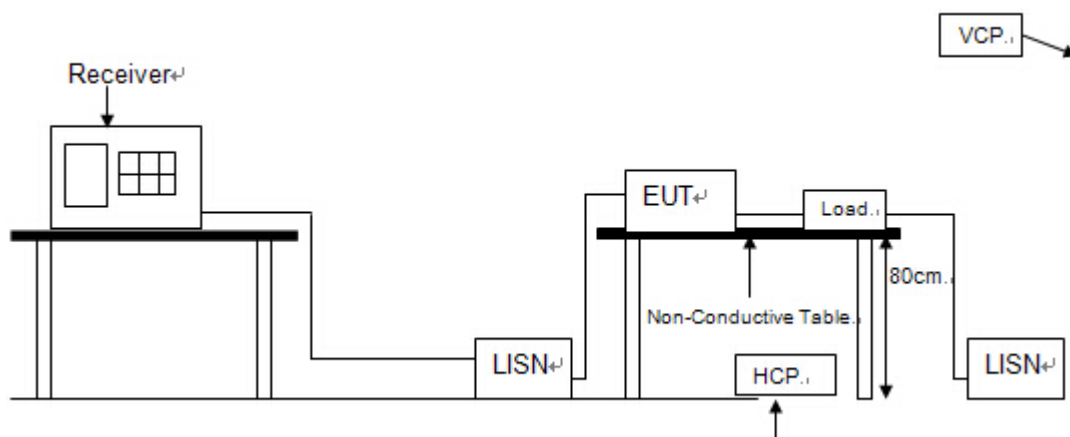
3.1.3 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal reference ground plane and 0.4meters from vertical reference ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use.

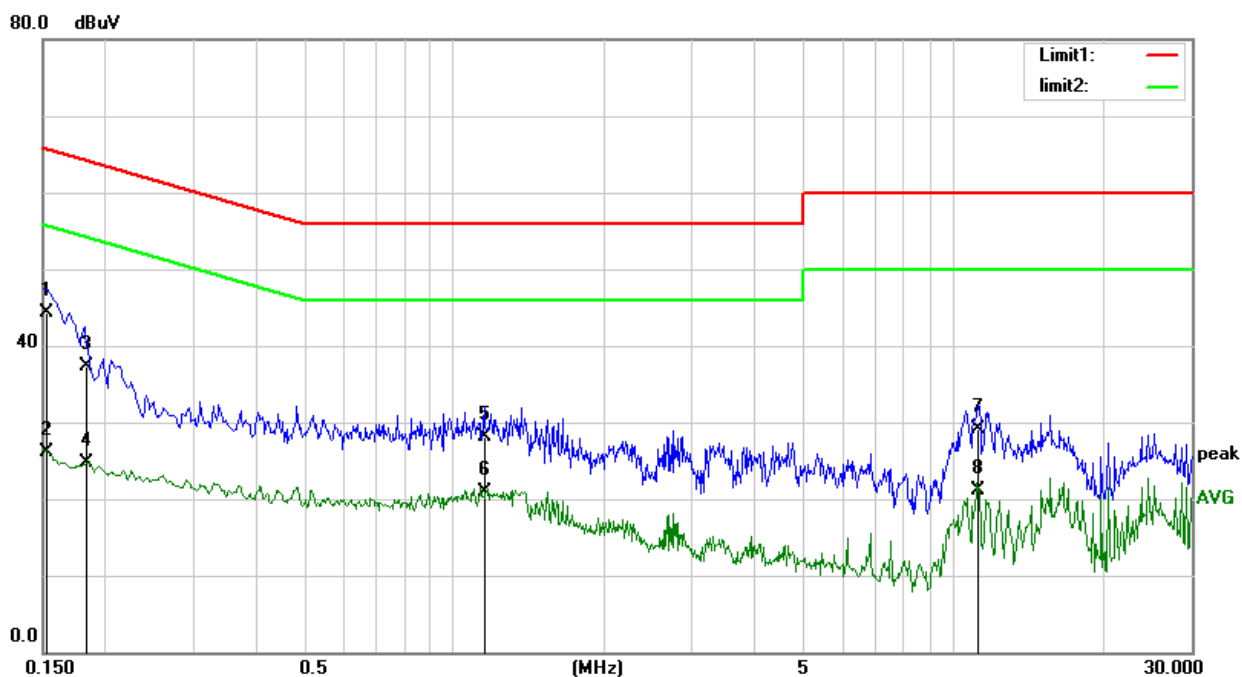
3.1.7 TEST RESULTS

EUT :	Power bank
Model No. :	UP-9091
Test Mode :	Charging
Test Result:	PASS

Remark

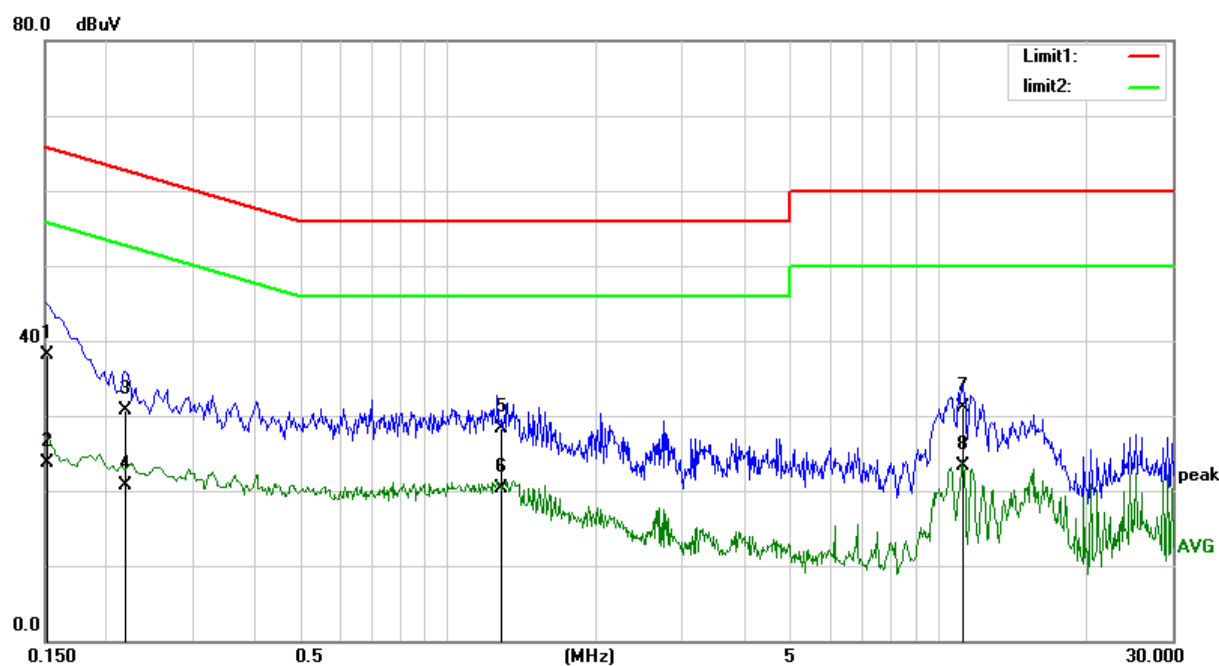
- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=10KHz,VBW =10KHz, Sweep. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Sweep. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『 Note 』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform.In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured.
- (3) Measuring frequency range from 150KHz to 30MHz.
- (4) Measurement result=Reading + Correct.

EUT:	Power bank	Model No. :	UP-9091
Temperature:	24 °C	Relative Humidity:	55 %
Phase:	L1	Test Power :	5Vdc from Adapter Input 230Vac,50Hz
Standard:	(CE)EN55032 class B_QP	Test By:	Jack
Test Mode :	Charging		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dB	Over dB	Detector	Comment
1	*	0.1524	34.67	9.70	44.37	65.93	-21.56	QP	
2		0.1524	16.44	9.70	26.14	55.93	-29.79	AVG	
3		0.1835	27.70	9.69	37.39	65.04	-27.65	QP	
4		0.1835	15.01	9.69	24.70	55.04	-30.34	AVG	
5		1.1500	18.27	9.78	28.05	56.00	-27.95	QP	
6		1.1539	11.18	9.78	20.96	46.00	-25.04	AVG	
7		11.2380	18.90	10.14	29.04	60.00	-30.96	QP	
8		11.2380	10.95	10.14	21.09	50.00	-28.91	AVG	

EUT:	Power bank	Model No. :	UP-9091
Temperature:	24 °C	Relative Humidity:	55 %
Phase:	N	Test Power :	5Vdc from Adapter Input 230Vac,50Hz
Standard:	(CE)EN55032 class B_QP	Test By:	Jack
Test Mode :	Charging		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dB	Over dB	Detector	Comment
1		0.1518	28.39	9.69	38.08	65.95	-27.87	QP	
2		0.1518	13.96	9.69	23.65	55.95	-32.30	AVG	
3		0.2188	21.05	9.69	30.74	64.03	-33.29	QP	
4		0.2188	10.98	9.69	20.67	54.03	-33.36	AVG	
5		1.2786	18.52	9.79	28.31	56.00	-27.69	QP	
6	*	1.2786	10.52	9.79	20.31	46.00	-25.69	AVG	
7		11.2182	20.86	10.18	31.04	60.00	-28.96	QP	
8		11.2182	13.20	10.18	23.38	50.00	-26.62	AVG	

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	Field strengths limits at 3m Measuring distance: dBuV/m
30 – 230	40
230 – 1000	47

Notes:

- (1) The limit for radiated test was performed according to as following:
EN55032.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The highest internal source of the EUT is less than108 MHz,the measurement shall only be Made up to 1GHz.

3.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	SCHWARZBECK	VULB9168	VULB9168-192	11/13/2018
2	Pre-Amplifier	EM Electronics Corporation	EM330	60603	11/13/2018
3	EMI Test Receiver	R&S	ESCI	101368	11/13/2018
4	Turn Table	UC	UC3000	N/A	N/A
5	Antenna Mast	UC	UC3000	N/A	N/A

Remark: " N/A" denotes No Model No. / Serial No. and No Calibration specified.

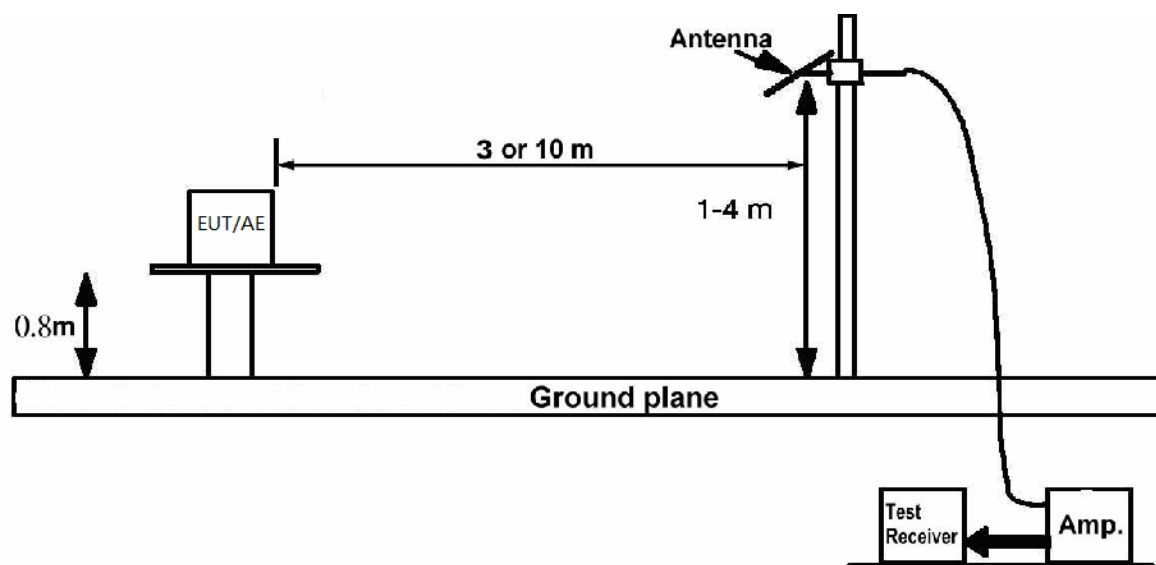
3.2.3 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP



3.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.2 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.7 TEST RESULTS

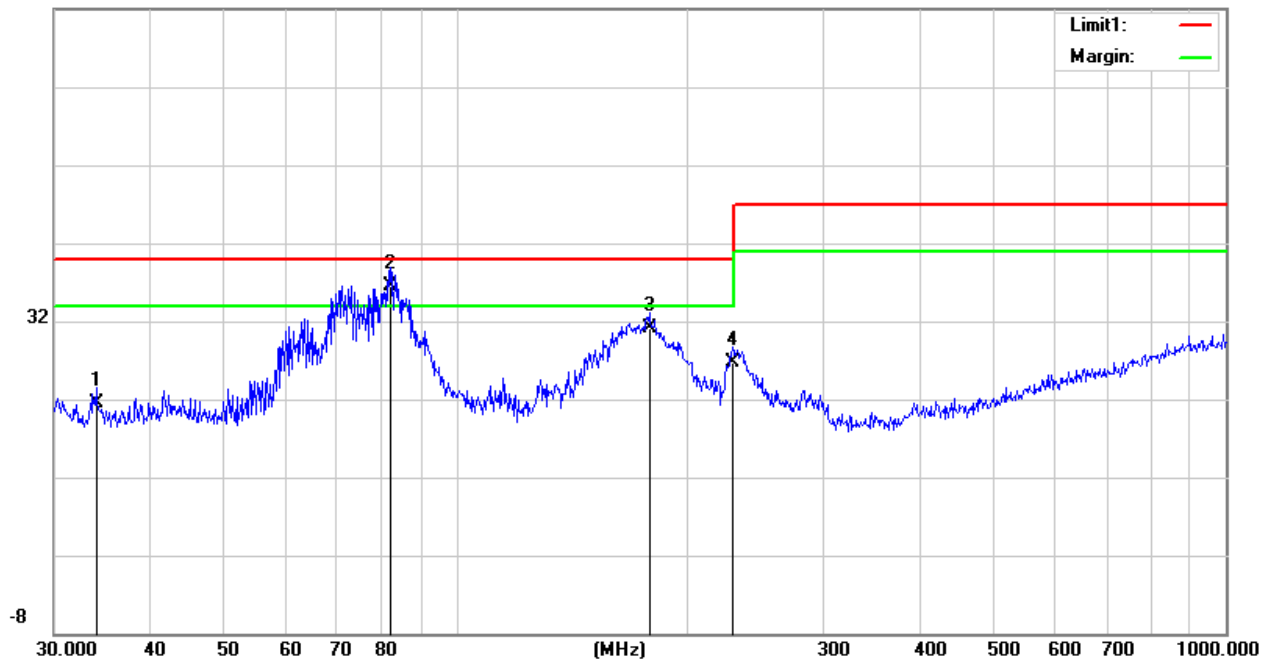
EUT :	Power bank
Model No. :	UP-9091
Test Mode :	Charging, Discharge
Test Result:	PASS

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz; SPA setting in RBW=120KHz, VBW =120KHz, Sweep. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table.
- (5) Measurement Result = Reading + Correct

EUT :	Power bank	Model No. :	UP-9091
Temperature :	24 °C	Relative Humidity :	55 %
Distance:	3m	Test Power :	5Vdc from Adapter Input 230Vac,50Hz
Polarization:	Vertical	Test By:	Jack
Standard:	(RE)EN55032 Class B 3M		
Test Mode :	Charging		

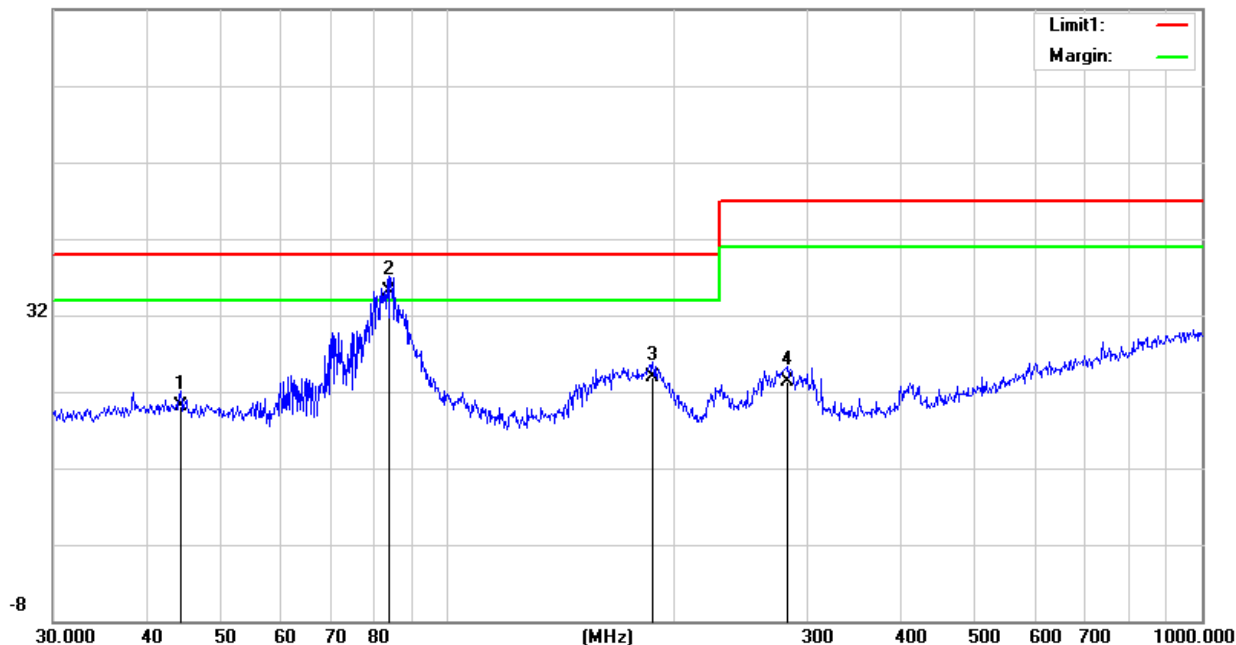
72.0 dBuV/m



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment				
			dBuV	dB	dBuV/m	dB/m	dB	Detector	Comment
1		34.0365	6.88	14.65	21.53	40.00	-18.47	QP	
2	*	81.8906	26.30	10.14	36.44	40.00	-3.56	QP	
3		178.1327	18.21	12.89	31.10	40.00	-8.90	QP	
4		228.4904	14.04	12.61	26.65	40.00	-13.35	QP	

EUT :	Power bank	Model No. :	UP-9091
Temperature :	24 °C	Relative Humidity :	55 %
Distance:	3m	Test Power :	5Vdc from Adapter Input 230Vac,50Hz
Polarization:	Horizontal	Test By:	Jack
Standard:	(RE)EN55032 Class B 3M		
Test Mode :	Charging		

72.0 dBuV/m

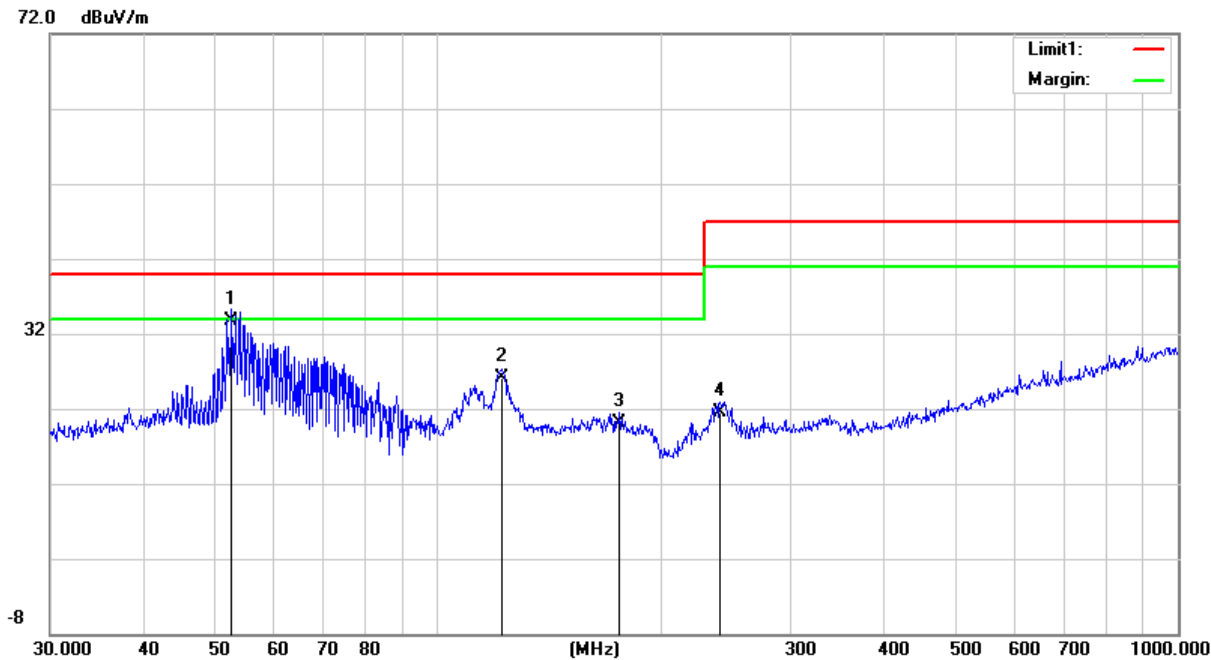


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	Comment
1		44.2752	4.85	15.29	20.14	40.00	-19.86	QP	
2	*	83.8156	24.90	10.18	35.08	40.00	-4.92	QP	
3		187.0958	11.62	12.24	23.86	40.00	-16.14	QP	
4		281.9946	8.64	14.63	23.27	47.00	-23.73	QP	

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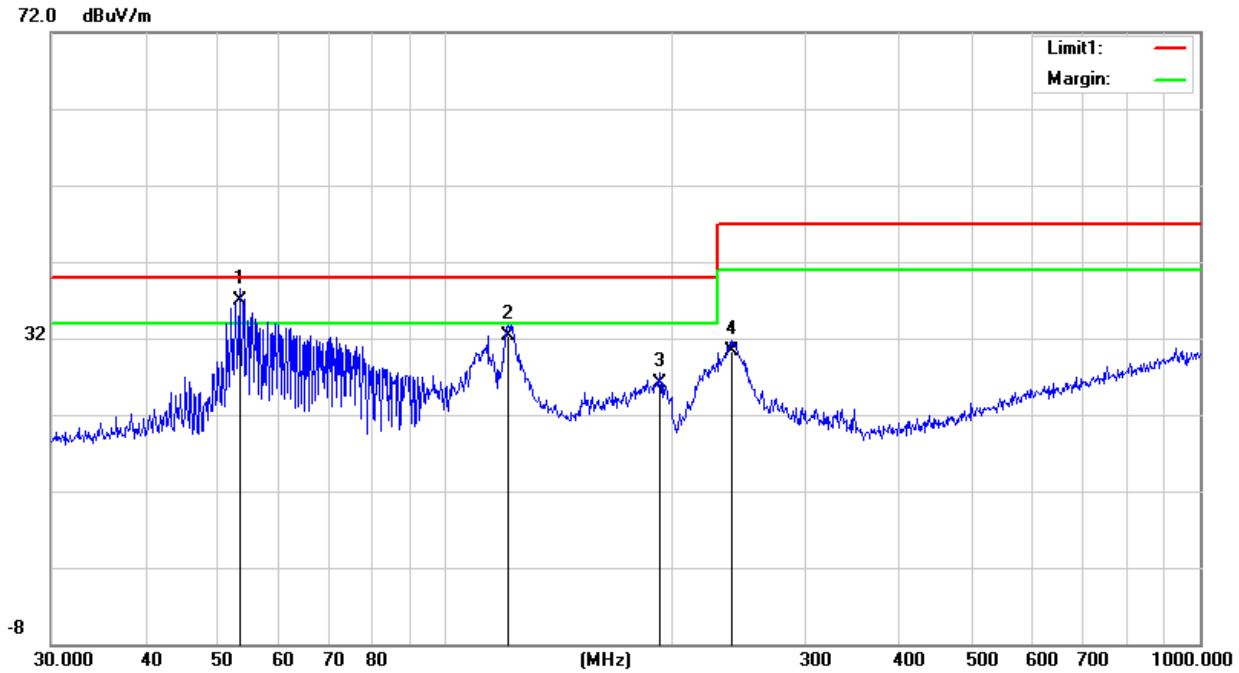
EUT :	Power bank	Model No. :	UP-9091
Temperature :	24 °C	Relative Humidity :	55 %
Distance:	3m	Test Power :	5Vdc
Polarization:	Vertical	Test By:	Jack
Standard:	(RE)EN55032 Class B 3M		
Test Mode :	Discharge		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	Factor	ment			Detector	Comment
1	*	52.7599	19.10	14.70	33.80	40.00	-6.20	QP	
2		121.9754	12.88	13.13	26.01	40.00	-13.99	QP	
3		176.2685	7.11	13.07	20.18	40.00	-19.82	QP	
4		240.8303	8.27	13.32	21.59	47.00	-25.41	QP	



EUT :	Power bank	Model No. :	UP-9091
Temperature :	24 °C	Relative Humidity :	55 %
Distance:	3m	Test Power :	5Vdc
Polarization:	Horizontal	Test By:	Jack
Standard:	(RE)EN55032 Class B 3M		
Test Mode :	Discharge		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	Comment
1	*	53.6779	22.27	14.60	36.87	40.00	-3.13	QP	
2		121.1231	19.17	13.07	32.24	40.00	-7.76	QP	
3		192.4186	14.17	11.89	26.06	40.00	-13.94	QP	
4		239.9874	16.97	13.30	30.27	47.00	-16.73	QP	

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION Level	Test Mode Test Ports	Perform. Criteria	Remark
1. ESD IEC/EN 61000-4-2	+8KV air discharge +4KV contact discharge	Direct Mode	B	
	+4KV HCP discharge +4KV VCP discharge	Indirect Mode	B	
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz 3V/m(rms), 1 KHz, 80%, AM modulated	Enclosure	A	
3. EFT/Burst IEC/EN 61000-4-4	1.0KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	AC Power Port	B	N/A
	0.5 KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B	N/A
4. Surges IEC/EN 61000-4-5	±1 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-N	B	N/A
	±2 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-PE N-PE	B	N/A
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz 3V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	CTL/Signal Port	A	N/A
	0.15 MHz to 80 MHz 3V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	AC Power Port	A	N/A
	0.15 MHz to 80 MHz 3V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	DC Power Port	A	N/A
6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50 Hz, 1A/m	Enclosure	A	N/A
7. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip > 95% / 30% Interruption > 95%	AC Power Port	B / C C	N/A

* Remark:

(1) : "N/A": denotes test is not applicable in this Test Report.

4.2 GENERAL PERFORMANCE CRITERIA

According to EN55024 standard, the general performance criteria as following:

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 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 phenomenon 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 if stored data 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.

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of 4.2 Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge: $\pm 2\text{kV}/\pm 4\text{kV}/\pm 8\text{kV}$ (Direct) Contact Discharge: $\pm 2\text{kV}/\pm 4\text{kV}$ (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 50 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

4.4.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Electrostatic Discharge Simulator	Prima	ESD61002BG	PR15092978	11/13/2018

4.4.3 TEST PROCEDURE

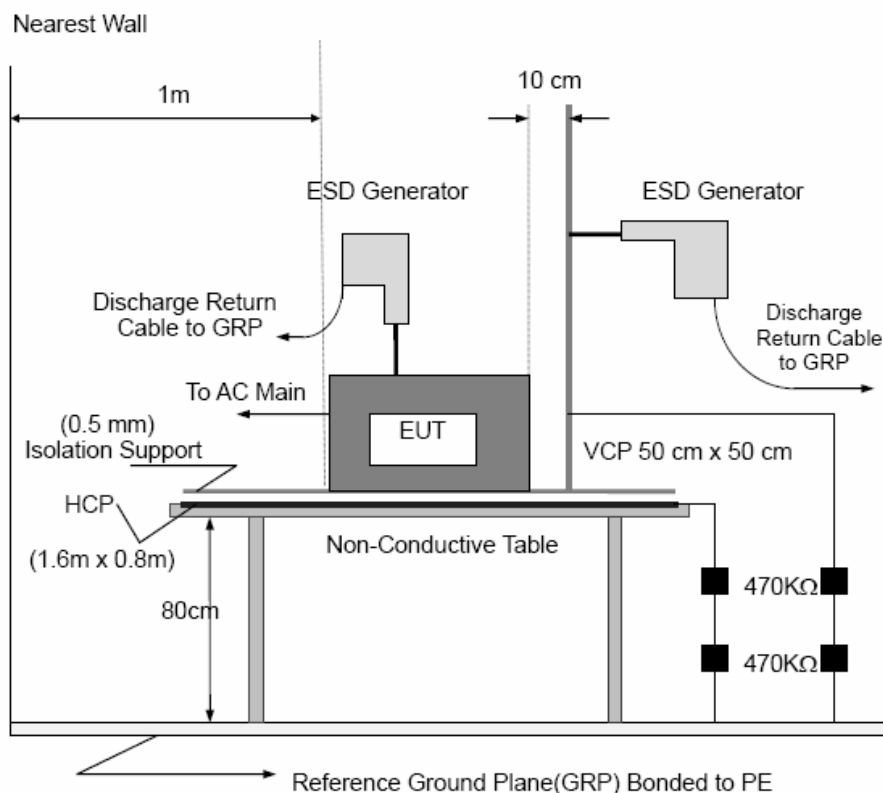
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center 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 are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
- Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.4.6 TEST RESULTS

EUT:	Power bank	Model No. :	UP-9091
Temperature:	24 °C	Relative Humidity:	55 %
Pressure:	1007 hPa	Test Power :	5Vdc from Adapter Input 230Vac,50Hz
Test Mode :	Charging, Discharge		

Mode	Air Discharge								Contact Discharge							
	±2KV		±4KV		±8KV		±12KV		±2KV		±4KV		±6KV		±8KV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Slot	A	A	A	A	A	A										
Enclosure	A	A	A	A	A	A										
Metal									A	A	A	A				
Criteria	B								B							
Result	A								A							
Judgment	PASS								PASS							

Mode	HCP Discharge								VCP Discharge							
	±2KV		±4KV		±6KV		±8KV		±2KV		±4KV		±6KV		±8KV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Front	A	A	A	A					A	A	A	A				
Rear	A	A	A	A					A	A	A	A				
Left	A	A	A	A					A	A	A	A				
Right	A	A	A	A					A	A	A	A				
Criteria	B								B							
Result	A								A							
Judgment	PASS								PASS							

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) Test condition:
Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point. Air discharges: Minimum 50 times (Positive/Negative) at each point.
- 3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 4) The Indirect (HCP/VCP) discharges description of test point as following:
1.left side 2.right side 3.front side 4.rear side
- 5) N/A - denotes test is not applicable in this test report
- 6) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

4.5 RS TESTING

4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

4.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	Agilent	N517113-50B	MY53050160	11/13/2018
2	Amplifier	A&R	150W1000M3	313157	11/13/2018
3	Log-periodic Antenna	Schwarzbeck	STLP 9128E	9128E-012	11/13/2018
4	Isotropic Field Probe	A&R	FL7006	0342652	11/13/2018
5	Amplifier	A&R	50SIG6M2	0342835	11/13/2018
6	Antenna	Schwarzbeck	STLP9149	9149.222	11/13/2018

4.5.3 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

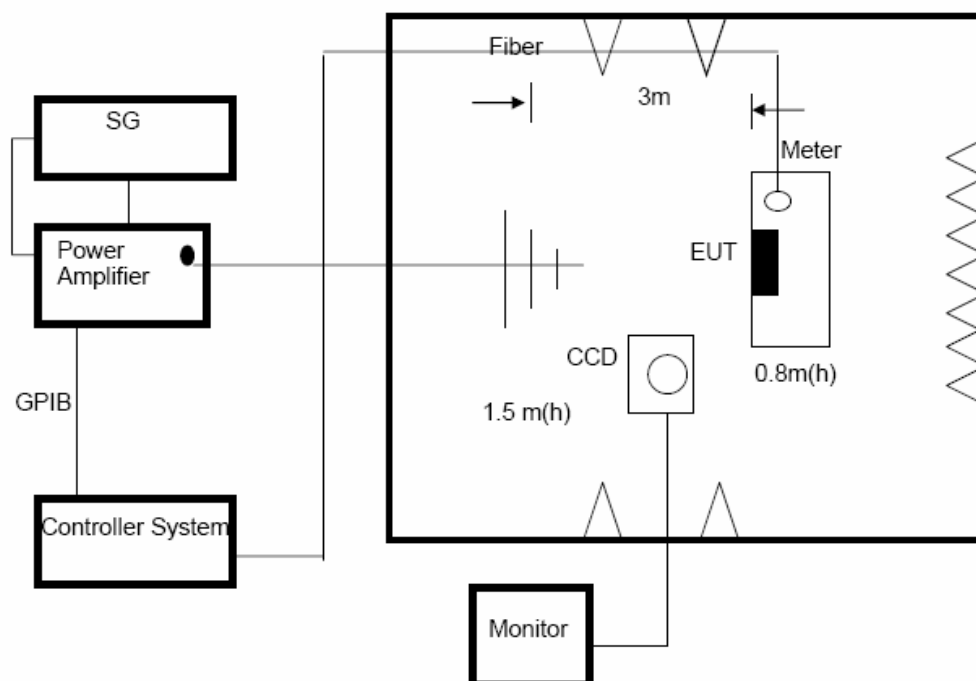
The other condition as following manner:

- The field strength level was 3V/m.
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.5.6 TEST RESULTS

EUT:	Power bank	Model No. :	UP-9091
Temperature:	24 °C	Relative Humidity:	55 %
Pressure:	1004 hPa	Test Power :	5Vdc from Adapter Input 230Vac,50Hz
Test Mode :	Charging, Discharge		

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80MHz - 1000MHz	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	0	A	A	PASS
			90			
			180			
			270			

Note:

- 1) H/V denotes the Horizontal/Vertical polarity of the RF field.
- 2) Criteria A: There was no change operated with initial operating during the test.
- 3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 4) Criteria C: The system shut down during the test.

5. EUT TEST PHOTOS

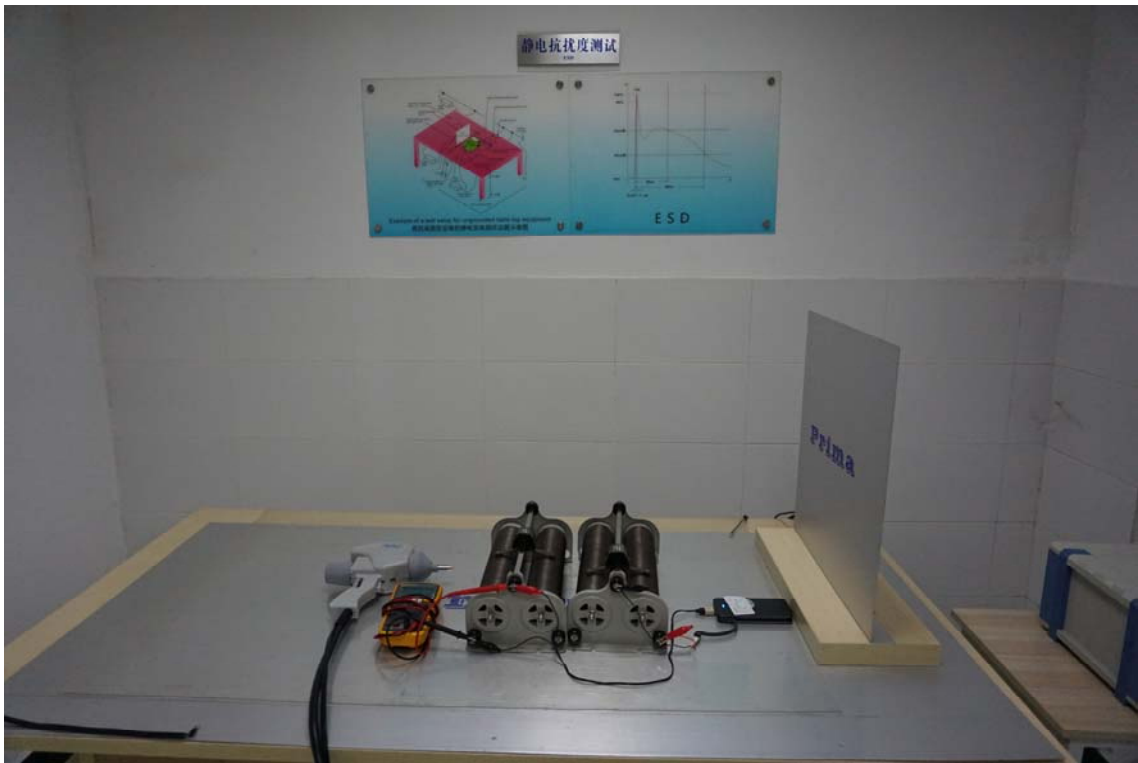
Conducted Measurement Photo



Radiated Measurement Photo

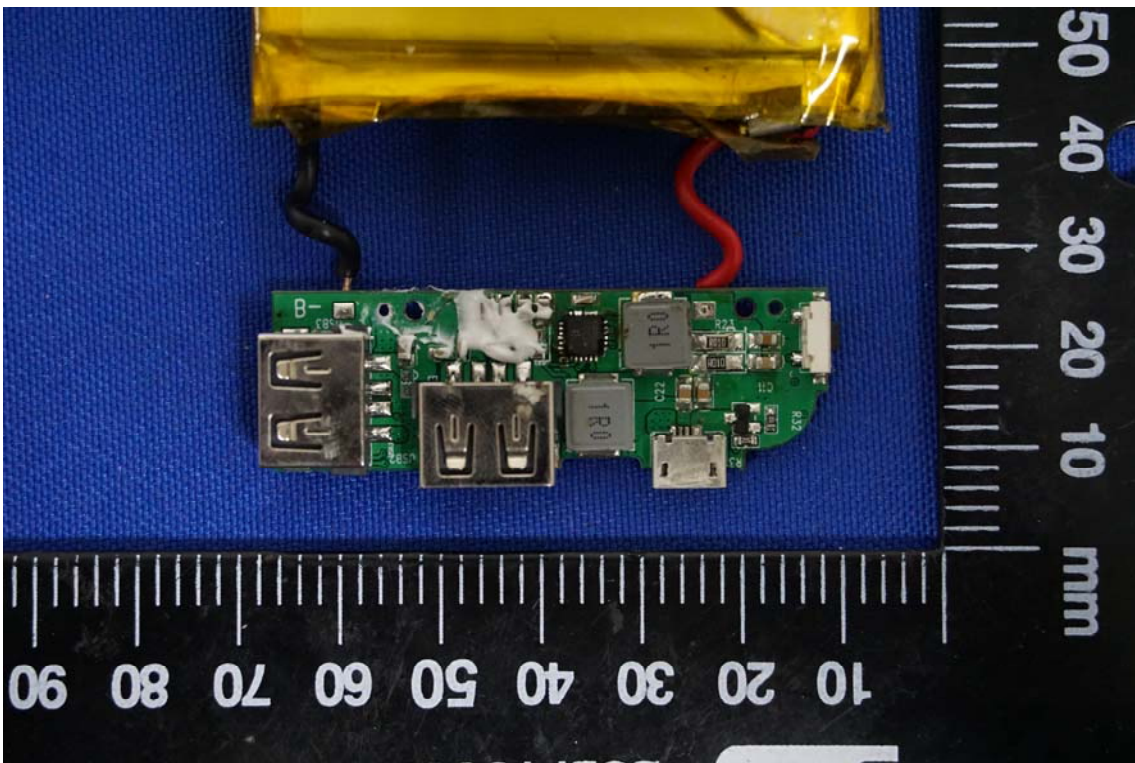


ESD Measurement Photo

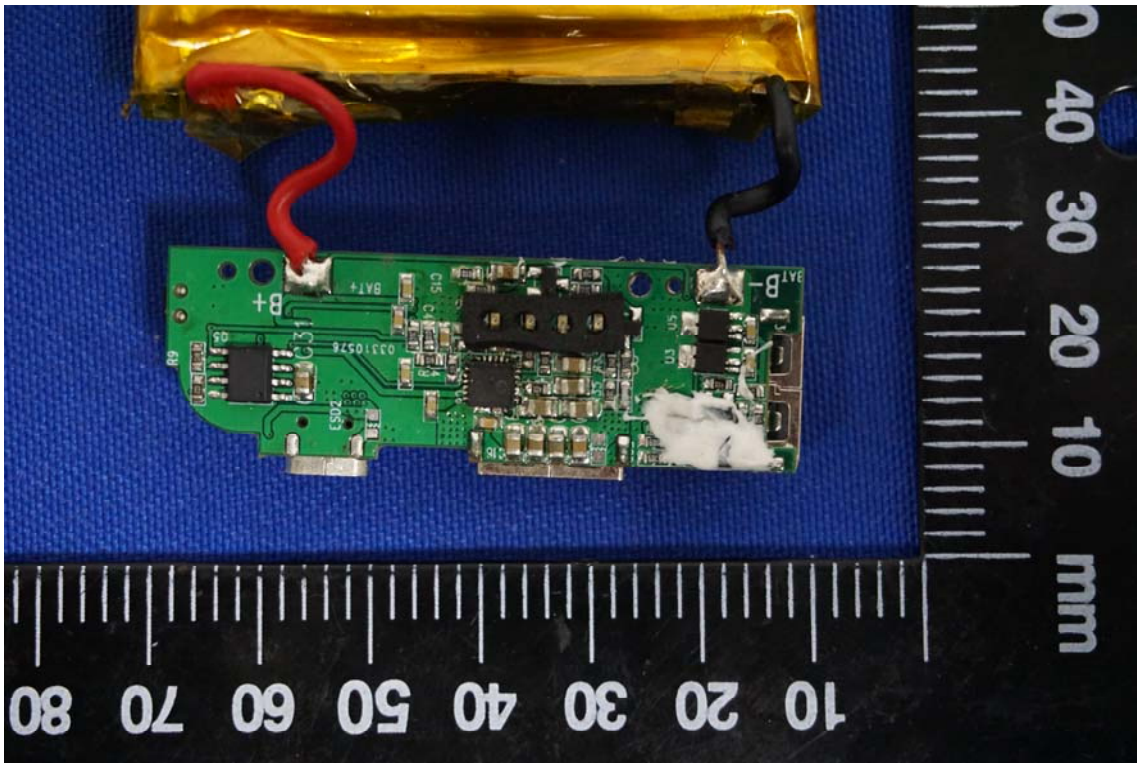


6. EUT PHOTOS





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END OF REPORT