

EMC TEST REPORT for

Power bank

Model No.: LP-1005A, LP-605A, LP-2005A, LP-1005B, LP-525A, LP-1025A, LP-2025A,
LP-507A PLUS, LP-707A PLUS, LP-1007A PLUS, LP-1030A, LP-510A, LP-1010A,
LP-1008B, LP-613B, LP-1013B, LP-2013B

Prepared for :
Address :

Prepared by : Accurate Technology Co., Ltd.
Address : F1, Bldg. A&D, Changyuan New Material Port, Keyuan
Rd., Science & Industry Park, Nanshan District, Shenzhen
518057, P.R. China

Tel: +86-755-26503290
Fax: +86-755-26503396

Report No. : ATE20171014
Date of Test : June 12, 2017
Date of Report : June 14, 2017

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Test Report Declaration

Applicant :
Manufacturer :
Product : Power bank
Model No. : LP-1005A, LP-605A, LP-2005A, LP-1005B, LP-525A, LP-1025A, LP-2025A, LP-507A PLUS, LP-707A PLUS, LP-1007A PLUS, LP-1030A, LP-510A, LP-1010A, LP-1008B, LP-613B, LP-1013B, LP-2013B

Measurement Procedure Used:

EN 55032: 2012

EN 55024: 2010 (IEC 61000-4-2: 2008

IEC 61000-4-3: 2006+A1:2007+A2:2010

IEC 61000-4-8: 2009)


The device described above is tested by Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Accurate Technology Co., Ltd. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 55032, EN 61000-3-2, EN 61000-3-3 and EN 55024 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Accurate Technology Co., Ltd.

Date of Test : June 12, 2017

Date of Report : June 14, 2017

Prepared by :

Bob Wang
(Bob Wang, Engineer)

Sean Liu
(Sean Liu, Manager)

Accurate Technology Co., Ltd.

Address: F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P. R. China
Tel: +86-755-26503290 Fax: +86-755-26503396 E-mail: webmaster@atc-lab.com Http://www.atc-lab.com

1. TEST RESULTS SUMMARY

Test Items	Test Standard	Test Results
Conducted Emission	EN 55032: 2012	Pass
Radiated Emission	EN 55032: 2012	Pass
Harmonic Current Emission	EN 61000-3-2: 2014	N/A
Voltage Fluctuation and Flicker Emission	EN 61000-3-3: 2013	N/A
Electrostatic Discharge Immunity	EN 55024: 2010 (IEC 61000-4-2: 2008)	Pass
Radiated Electromagnetic Fields Immunity	EN 55024: 2010 (IEC 61000-4-3: 2006+A1:2007+A2:2010)	Pass
Electrical Fast Transient /Burst Immunity	EN 55024: 2010 (IEC 61000-4-4: 2012)	N/A
Surge Immunity	EN 55024: 2010 (IEC 61000-4-5: 2005)	N/A
Injected Current Susceptibility	EN 55024: 2010 (IEC 61000-4-6: 2008)	N/A
Magnetic Field Susceptibility	EN 55024: 2010 (IEC 61000-4-8: 2009)	Pass
Voltage dips and interruptions Immunity	EN 55024: 2010 (IEC 61000-4-11: 2004)	N/A

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product : Power bank

Model No. : LP-1005A, LP-605A, LP-2005A, LP-1005B, LP-525A, LP-1025A, LP-2025A, LP-507A PLUS, LP-707A PLUS, LP-1007A PLUS, LP-1030A, LP-510A, LP-1010A, LP-1008B, LP-613B, LP-1013B, LP-2013B
(Note: Above models are identical in schematic, structure and critical components except for model name. So we prepare LP-1005A for test only.)

Rating : DC 3.7V & DC 5V (Power by USB port)

Trade Mark :
Remark(s) : The EUT highest operating frequency provided by Manufacturer is less than 108 MHz, the radiated emission measurement shall be made up to 1 GHz.

Applicant :
Address :

Manufacturer :
Address :

Date of sample : June 10, 2017
receiver

Date of Test : June 12, 2017

2.2. Accessory and Auxiliary Equipment

AC/DC Power Adapter: Model: HW-05010002W
(provided by laboratory) INPUT: AC 100-240V; 50/60Hz
OUTPUT: DC 5V; 1.0A

2.3. Description of Test Facility

EMC Lab	:	Listed by Federal Communications Commission (FCC) The Registration Number is 752051
		Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2
		Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193
		Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Accurate Technology Co., Ltd.
Site Location	:	F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P.R. China
Subcontracted Items	:	1) Radiated RF Electromagnetic Fields
Subcontractor	:	Shenzhen Academy of Metrology and Quality Inspection
Site Location	:	Bldg. of Metrology & Quality Inspection, Longzhu Road Nanshan District, Shenzhen, Guangdong, China

2.4. Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Power Disturbance Expanded Uncertainty	=	2.92 dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1.The Equipment Used to Measure Conducted Disturbance (L.I.S.N)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	100307	Jan.7, 2017	1 Year
2.	Test Receiver	Rohde & Schwarz	ESPI	100396/003	Jan.7, 2017	1 Year
3.	Test Receiver	Rohde & Schwarz	ESPI	101526/003	Jan.7, 2017	1 Year
4.	Test Receiver	Rohde & Schwarz	ESR	101817	Jan.7, 2017	1 Year
5.	L.I.S.N.	Schwarzbeck	NLSK8126	8126431	Jan.7, 2017	1 Year
6.	L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100305	Jan.7, 2017	1 Year
7.	L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100310	Jan.7, 2017	1 Year
8.	L.I.S.N.	Rohde & Schwarz	ESH3-Z6	100132	Jan.7, 2017	1 Year
9.	L.I.S.N.	Rohde & Schwarz	ESH3-Z6	100979	Jan.7, 2017	1 Year
10.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100305	Jan.7, 2017	1 Year
11.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100312	Jan.7, 2017	1 Year
12.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100815	Jan.7, 2017	1 Year
13.	50Ω Coaxial Switch	Anritsu Corp	MP59B	620028393 6	Jan.7, 2017	1 Year
14.	50Ω Coaxial Switch	Anritsu Corp	MP59B	620028393 3	Jan.7, 2017	1 Year
15.	50Ω Coaxial Switch	Anritsu Corp	MP59B	620050647 4	Jan.7, 2017	1 Year
16.	VOLTAGE PROBE	Schwarzbeck	TK9416	N/A	Jan.7, 2017	1 Year
17.	RF CURRENT PROBE	Rohde & Schwarz	EZ-17	100048	Jan.7, 2017	1 Year
18.	8-Wire Impedance Stabilisation Network	Schwarzbeck	CAT5 8158	8158-0035	Jan.7, 2017	1 Year
19.	RF Coaxial Cable	SUHNER	N-2m	No.2	Jan.7, 2017	1 Year
20.	RF Coaxial Cable	SUHNER	N-2m	No.3	Jan.7, 2017	1 Year
21.	RF Coaxial Cable	SUHNER	N-2m	No.14	Jan.7, 2017	1 Year

3.2.The Equipment Used to Measure Radiated Disturbance

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan.7, 2017	1 Year
2.	Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Jan.7, 2017	1 Year
3.	Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan.7, 2017	1 Year
4.	Test Receiver	Rohde& Schwarz	ESPI	100396/003	Jan.7, 2017	1 Year
5.	Test Receiver	Rohde& Schwarz	ESPI	101526/003	Jan.7, 2017	1 Year
6.	Test Receiver	Rohde& Schwarz	ESR	101817	Jan.7, 2017	1 Year
7.	Bilog Antenna	Schwarzbeck	VULB9163	9163-194	Jan.13, 2017	1 Year
8.	Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan.13, 2017	1 Year
9.	Log.-Per.Antenna	Schwarzbeck	VUSLP 9111B	9111B-074	Jan.13, 2017	1 Year
10.	Biconical Broad Band Antenna	Schwarzbeck	VHBB 9124+BBA 9106	9124-617	Jan.13, 2017	1 Year
11.	Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan.13, 2017	1 Year
12.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan.13, 2017	1 Year
13.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan.13, 2017	1 Year
14.	Vertical Active Monopole Antenna	Schwarzbeck	VAMP 9243	9243-370	Jan.13, 2017	1 Year
15.	RF Switching Unit+PreAMP	Compliance Direction	RSU-M2	38322	Jan.7, 2017	1 Year
16.	Pre-Amplifier	Agilent	8447D	294A10619	Jan.7, 2017	1 Year
17.	Pre-Amplifier	Rohde&Schwarz	CBLU11835 40-01	3791	Jan.7, 2017	1 Year
18.	50 Coaxial Switch	Anritsu Corp	MP59B	6200237248	Jan.7, 2017	1 Year
19.	50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan.7, 2017	1 Year
20.	RF Coaxial Cable	Schwarzbeck	N-5m	No.1	Jan.7, 2017	1 Year
21.	RF Coaxial Cable	Schwarzbeck	N-1m	No.6	Jan.7, 2017	1 Year
22.	RF Coaxial Cable	Schwarzbeck	N-1m	No.7	Jan.7, 2017	1 Year
23.	RF Coaxial Cable	SUHNER	N-3m	No.8	Jan.7, 2017	1 Year
24.	RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	Jan.7, 2017	1 Year
25.	RF Coaxial Cable	SUHNER	N-6m	No.10	Jan.7, 2017	1 Year
26.	RF Coaxial Cable	RESENBERGER	N-12m	No.11	Jan.7, 2017	1 Year
27.	RF Coaxial Cable	RESENBERGER	N-0.5m	No.12	Jan.7, 2017	1 Year
28.	RF Coaxial Cable	SUHNER	N-2m	No.13	Jan.7, 2017	1 Year
29.	RF Coaxial Cable	SUHNER	N-0.5m	No.15	Jan.7, 2017	1 Year
30.	RF Coaxial Cable	SUHNER	N-2m	No.16	Jan.7, 2017	1 Year
31.	RF Coaxial Cable	RESENBERGER	N-6m	No.17	Jan.7, 2017	1 Year

3.3.The Equipment Used to Measure Harmonic & Flicker

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	AC Power Source	California Instruments	5001iX-400	55689	Jan.7, 2017	1 Year
2.	Test analyzer	California Instruments	PACS-1	72254	Jan.7, 2017	1 Year

3.4.For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Generator	TESEQ	NSG 437	823	Jan.8, 2017	1 Year

3.5.The Equipment Used to Measure RF Immunity, Keyed Carrier

Item	Equipment	Manufacturer	Model No.	Eqpt No.	Last Cal.	Cal. Interval
1.	Signal Generator	Rohde & Schwarz	SMB100A	SB9422/02	Jul.03, 2016	1 Year
2.	Signal Generator	Rohde & Schwarz	SMF100A	SB8501/03	Apr.24, 2017	1 Year
3.	Voltage Meter	Rohde & Schwarz	URV5-Z2	SB9422/03	Apr.24, 2017	1 Year
4.	Voltage Meter	Rohde & Schwarz	URV5-Z2	SB9422/04	Apr.24, 2017	1 Year
5.	Power Probe	Rohde & Schwarz	NRP-Z81	SB9422/06	Apr.15, 2017	1 Year
6.	Power Probe	Rohde & Schwarz	NRP-Z81	SB9422/07	Apr.15, 2017	1 Year
7.	Power Meter	Rohde & Schwarz	NRP	SB9422/05	Apr.15, 2017	1 Year
8.	Power Amplifier	PRANA	MT310A	SB9422/08	Mar.28, 2017	1 Year
9.	Broadband Antenna	Rohde & Schwarz	HL046E	SB9422/13	Mar.28, 2017	1 Year
10.	Horn Antenna	AR	ATH800M5G A	SB9422/15	Mar.28, 2017	1 Year
11.	Power Amplifier	MILMEGA	A-001	SB9422/10	Mar.28, 2017	1 Year
12.	Power Meter	Rohde & Schwarz	NRVD	SB3437	Jul.03, 2016	1 Year

3.6.The Equipment Used to Measure EFT/Bursts Immunity

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ULTRA COMPACT SIMULATOR	EM TEST	UCS 500 N5	V0928104968	Jan.7, 2017	1Year
2.	CAPACITIVE CLAMP	EM TEST	HFK	0509-34	Jan.7, 2017	1Year
3.	EMC PRO SYSTEM (IMMUNITY TESTER)	THERMO	EMC PRO Plus-BASE	1108237	Jan.7, 2017	1Year

3.7.The Equipment Used to Measure Surge Immunity

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ULTRA COMPACT SIMULATOR	EM TEST	UCS 500 N5	V0928104968	Jan.7, 2017	1Year
2.	EMC PRO SYSTEM (IMMUNITY TESTER)	THERMO	EMC PRO Plus-BASE	1108237	Jan.7, 2017	1Year
3.	COUPLER DECOUPLER FOR TELECOM LINES	THERMO	CM-TEL-CD	0403273	Jan.7, 2017	1Year

3.8.For Injected Current Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Conducted Immunity Test System	FRANKONIA	CIT-10	126B1121	Jan.7, 2017	1Year
2.	CDN	FRANKONIA	CDN-M2/3	A3027020	Jan.7, 2017	1Year
3.	EM Injection Clamp	FCC	F-203I-23mm	091824	Jan.7, 2017	1Year
4.	6dB Attenuator	Weinschel	WA59-6-33	A329	Jan.7, 2017	1Year

3.9.For Magnetic Field Immunity Test

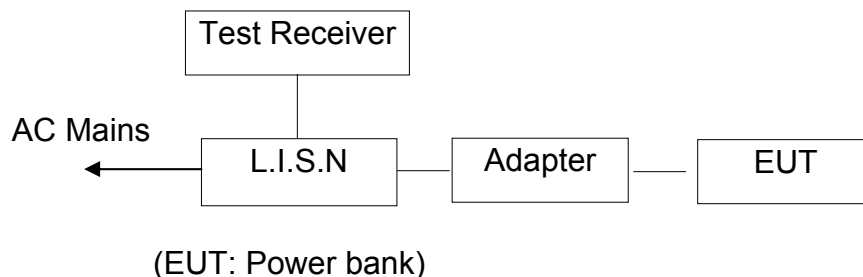
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HAEFELY	MAG100	150577	Jan.7, 2017	1 Year

3.10.For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ULTRA COMPACT SIMULATOR	EM TEST	UCS 500 N5	V0928104968	Jan.7, 2017	1Year

4. CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



4.2. Measuring Standard

EN 55032: 2012

4.3. Conducted Emission Limits (Class B)

4.3.1. Power Line Conducted Emission Limits (Class B)

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies. NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

4.4.EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN55022 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

4.4.1. Power bank (EUT)

Model Number : LP-1005A
Serial Number : n.a.
Manufacturer :

4.5.Operating Condition of EUT

4.5.1.Setup the EUT as shown on Section 4.1.

4.5.2.Turn on the power of all equipments.

4.5.3.Let the EUT work in measuring mode (CHARGING) measure it.

4.6.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN55022 regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9kHz in 150kHz-30MHz and 200Hz in 9kHz-150kHz.

The frequency range from 150kHz to 30MHz is investigated for AC mains.

4.7.Measuring Results

Pass

The frequency range from 150 kHz to 30MHz is investigated

Test mode: CHARGING								
MEASUREMENT RESULT: "1014-1_fin"								
2017-6-12 9:45								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.756000	42.70	11.1	56	13.3	QP	N	GND	
0.942000	40.80	11.1	56	15.2	QP	N	GND	
5.205000	39.00	11.4	60	21.0	QP	N	GND	
MEASUREMENT RESULT: "1014-1_fin2"								
2017-6-12 9:45								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.756000	35.00	11.1	46	11.0	AV	N	GND	
0.882000	34.60	11.1	46	11.4	AV	N	GND	
5.770000	31.50	11.5	50	18.5	AV	N	GND	
MEASUREMENT RESULT: "1014-2_fin"								
2017-6-12 9:47								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.754000	31.50	11.1	56	24.5	QP	L1	GND	
4.955000	36.40	11.4	56	19.6	QP	L1	GND	
5.935000	38.10	11.5	60	21.9	QP	L1	GND	
MEASUREMENT RESULT: "1014-2_fin2"								
2017-6-12 9:47								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.814000	34.90	11.1	46	11.1	AV	L1	GND	
0.942000	34.40	11.1	46	11.6	AV	L1	GND	
5.620000	31.80	11.5	50	18.2	AV	L1	GND	

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are shown in the following pages.

ACCURATE TECHNOLOGY CO., LTD

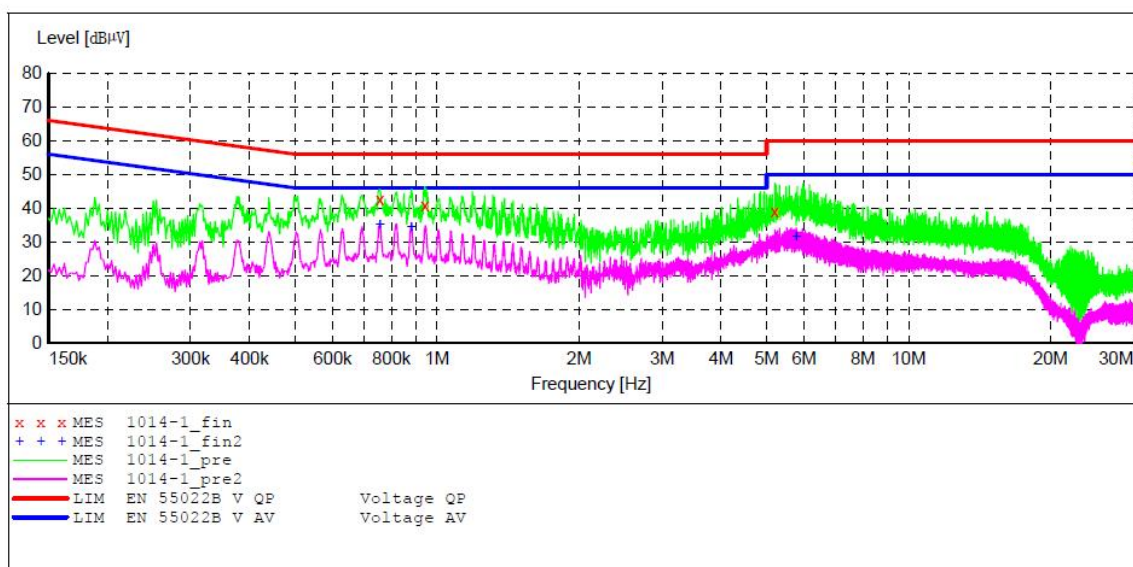
CONDUCTED EMISSION STANDARD EN 55032 B

EUT: Power bank M/N:LP-1005A
Manufacturer:
Operating Condition: CHARGING
Test Site: 2#Shielding Room
Operator: Nick
Test Specification: N 230V/50Hz
Comment: Report NO.:ATE20171014
Start of Test: 2017-6-12 / 9:44:04

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency 150.0 kHz	Frequency 30.0 MHz	Width 4.5 kHz	QuasiPeak	1.0 s	9 kHz	NSLK8126 2008
Average						



MEASUREMENT RESULT: "1014-1_fin"

2017-6-12 9:45

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.756000	42.70	11.1	56	13.3	QP	N	GND
0.942000	40.80	11.1	56	15.2	QP	N	GND
5.205000	39.00	11.4	60	21.0	QP	N	GND

MEASUREMENT RESULT: "1014-1_fin2"

2017-6-12 9:45

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.756000	35.00	11.1	46	11.0	AV	N	GND
0.882000	34.60	11.1	46	11.4	AV	N	GND
5.770000	31.50	11.5	50	18.5	AV	N	GND

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Address: F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P. R. China
Tel: +86-755-26503290 Fax: +86-755-26503396 E-mail: webmaster@atc-lab.com Http://www.atc-lab.com

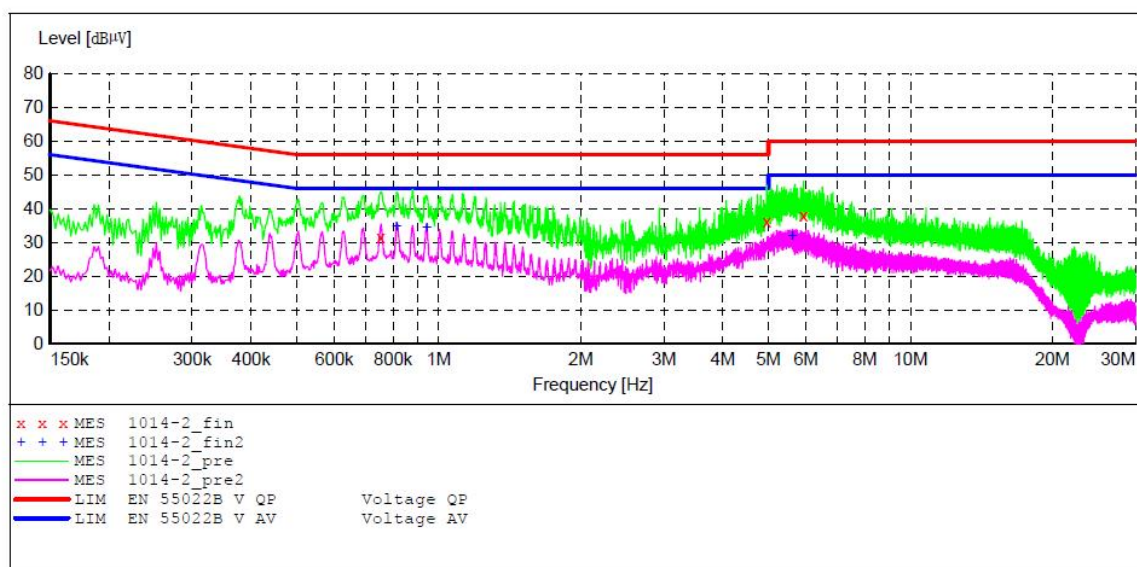
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD EN 55032 B

EUT: Power bank M/N:LP-1005A
 Manufacturer:
 Operating Condition: CHARGING
 Test Site: 2#Shielding Room
 Operator: Nick
 Test Specification: L 230V/50Hz
 Comment: Report NO.:ATE20171014
 Start of Test: 2017-6-12 / 9:46:34

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "1014-2_fin"

2017-6-12 9:47

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.754000	31.50	11.1	56	24.5	QP	L1	GND
4.955000	36.40	11.4	56	19.6	QP	L1	GND
5.935000	38.10	11.5	60	21.9	QP	L1	GND

MEASUREMENT RESULT: "1014-2_fin2"

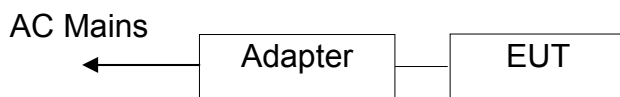
2017-6-12 9:47

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.814000	34.90	11.1	46	11.1	AV	L1	GND
0.942000	34.40	11.1	46	11.6	AV	L1	GND
5.620000	31.80	11.5	50	18.2	AV	L1	GND

5. RADIATED EMISSION MEASUREMENT

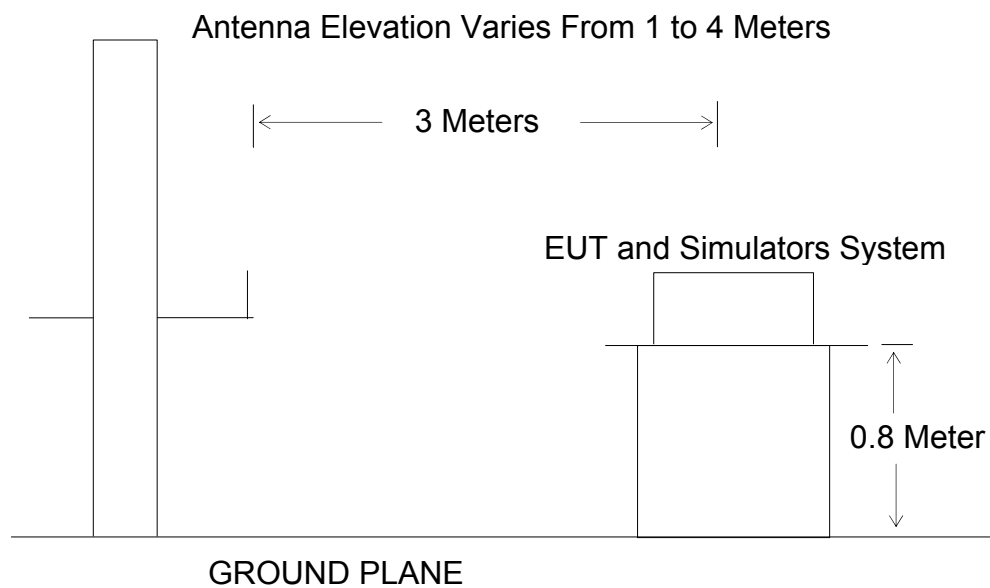
5.1. Block Diagram of Test

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Power bank)

5.1.2. Block diagram of test setup (In chamber)



(EUT: Power bank)

5.2. Measuring Standard

EN 55032: 2012

5.3.Radiated Emission Limits (Class B)

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Frequency (MHz)	Distance (Meters)	Field Strengths Limit dB(μ V/m)
30—230	3	40
230—1000	3	47

Frequency (GHz)	Distance (Meters)	Field Strengths Limit dB(μ V/m)	
		Average	Peak
1—3	3	50	70
3—6	3	54	74

- Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4.Conditional Testing Procedure

If the highest frequency of the internal sources of the EUT is less than 108MHz, the measurement shall only be made up to 1GHz.

If the highest frequency of the internal sources of the EUT is between 108MHz and 500MHz, the measurement shall only be made up to 2GHz.

If the highest frequency of the internal sources of the EUT is between 500MHz and 1GHz, the measurement shall only be made up to 5GHz.

If the highest frequency of the internal sources of the EUT is above 1GHz, the measurement shall only be made up to 5 times the highest frequency or 6GHz, whichever is less.

5.5.EUT Configuration on Test

The configuration of EUT is listed in Section 4.4.

5.6.Operating Condition of EUT

5.6.1.Turn on the power.

5.6.2.After that, let the EUT work in test mode (Charging, Discharging) measure it.

5.7. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCS30) is set at 120kHz.

5.8.Measuring Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated.

Test Mode : Charging								
Polarization								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	199.3416	44.00	-18.69	25.31	40.00	-14.69	QP
	2	279.3105	44.34	-16.64	27.70	47.00	-19.30	QP
	3	514.7533	41.10	-10.55	30.55	47.00	-16.45	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	143.2717	55.31	-22.34	32.97	40.00	-7.03	QP
	2	193.1366	48.79	-19.11	29.68	40.00	-10.32	QP
	3	523.8763	44.02	-10.33	33.69	47.00	-13.31	QP
Test Mode : Discharging								
Polarization								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	79.3970	57.04	-22.03	35.01	40.00	-4.99	QP
	2	142.2684	58.47	-22.34	36.13	40.00	-3.87	QP
	3	167.2249	54.69	-20.59	34.10	40.00	-5.90	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	53.0056	51.64	-21.29	30.35	40.00	-9.65	QP
	2	78.8409	58.34	-22.07	36.27	40.00	-3.73	QP
	3	140.2829	58.10	-22.31	35.79	40.00	-4.21	QP

The test data are shown in the following pages.



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F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: YJZH #1215

Standard: EN55032 CLASS B

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Power bank

Mode: CHARGING

Model: LP-1005A

Manufacturer: Blue Times

Polarization: Vertical

Power Source: DC 5V

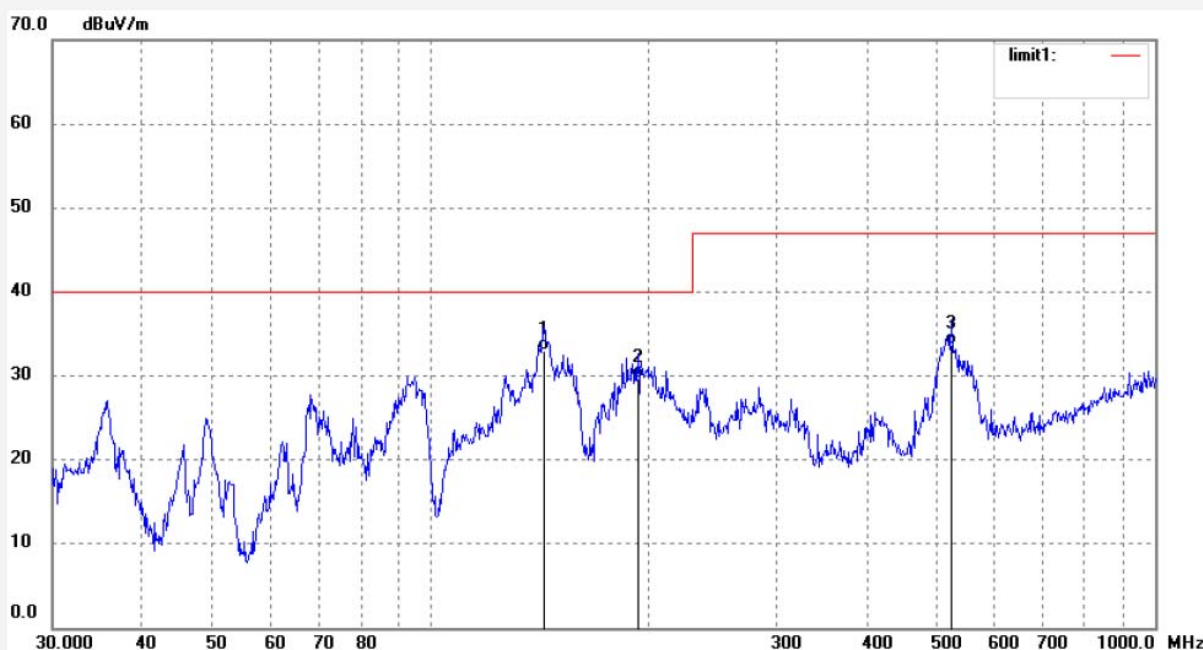
Date: 17/06/12/

Time: 10/30/12

Engineer Signature: Nick

Distance: 3m

Note: Report NO.: ATE20171014



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	143.2717	55.31	-22.34	32.97	40.00	-7.03	QP			
2	193.1366	48.79	-19.11	29.68	40.00	-10.32	QP			
3	523.8763	44.02	-10.33	33.69	47.00	-13.31	QP			

Accurate Technology Co., Ltd.

Address: F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P. R. China

Tel: +86-755-26503290

Fax: +86-755-26503396

E-mail: webmaster@atc-lab.com

Http://www.atc-lab.com



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: YJZH #1216
Standard: EN55032 CLASS B
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Power bank
Mode: CHARGING
Model: LP-1005A
Manufacturer: Blue Times

Polarization: Horizontal
Power Source: DC 5V
Date: 17/06/12/
Time: 10/32/35
Engineer Signature: Nick
Distance: 3m

Note: Report NO.: ATE20171014



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	199.3416	44.00	-18.69	25.31	40.00	-14.69	QP			
2	279.3105	44.34	-16.64	27.70	47.00	-19.30	QP			
3	514.7533	41.10	-10.55	30.55	47.00	-16.45	QP			

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Tel: +86-755-26503290 Fax: +86-755-26503396 E-mail: webmaster@atc-lab.com Http://www.atc-lab.com



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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: YJZH #1217

Standard: EN55032 CLASS B

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Power bank

Mode: DISCHARGING

Model: LP-1005A

Manufacturer: Blue Times

Polarization: Horizontal

Power Source: DC 3.7V

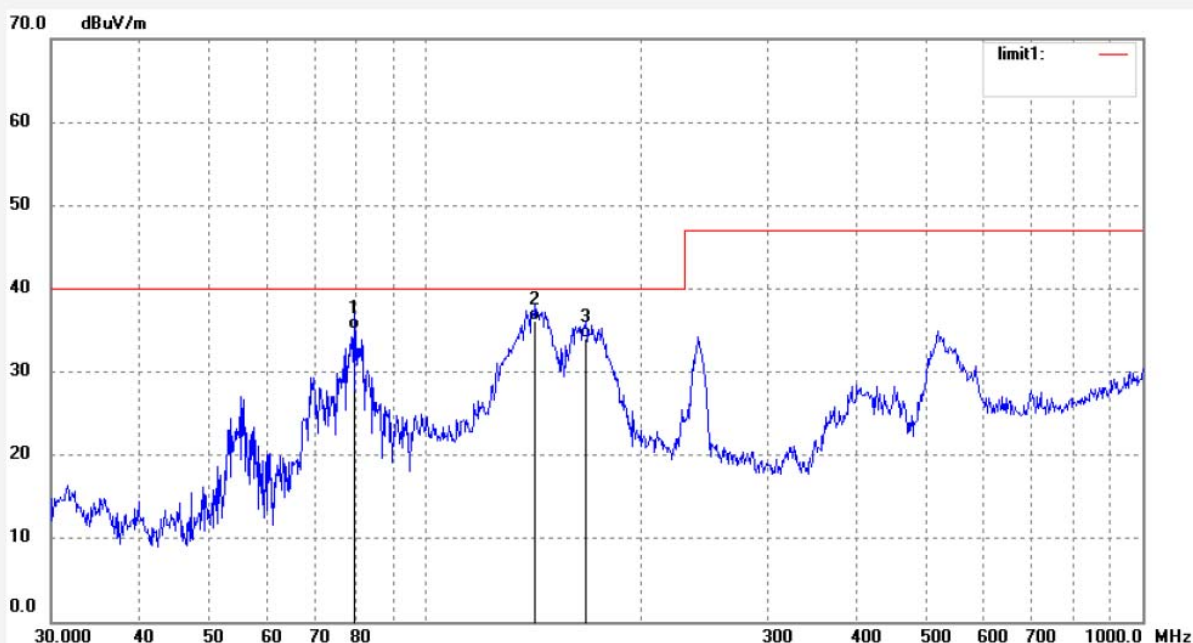
Date: 17/06/12/

Time: 10/41/29

Engineer Signature: Nick

Distance: 3m

Note: Report NO.: ATE20171014



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	79.3970	57.04	-22.03	35.01	40.00	-4.99	QP			
2	142.2684	58.47	-22.34	36.13	40.00	-3.87	QP			
3	167.2249	54.69	-20.59	34.10	40.00	-5.90	QP			

Accurate Technology Co., Ltd.

Address: F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P. R. China

Tel: +86-755-26503290

Fax: +86-755-26503396

E-mail: webmaster@atc-lab.com

Http://www.atc-lab.com



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Site: 1# Chamber

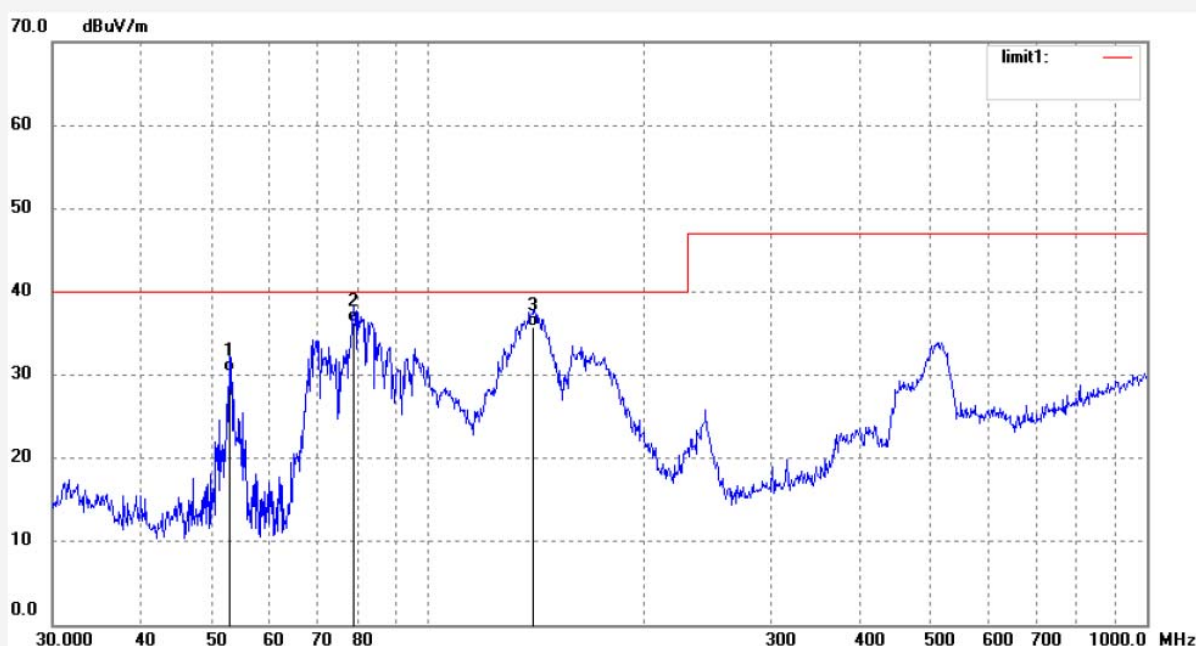
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: YJZH #1218
Standard: EN55032 CLASS B
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Power bank
Mode: DISCHARGING
Model: LP-1005A
Manufacturer: Blue Times

Polarization: Vertical
Power Source: DC 3.7V
Date: 17/06/12/
Time: 10/44/20
Engineer Signature: Nick
Distance: 3m

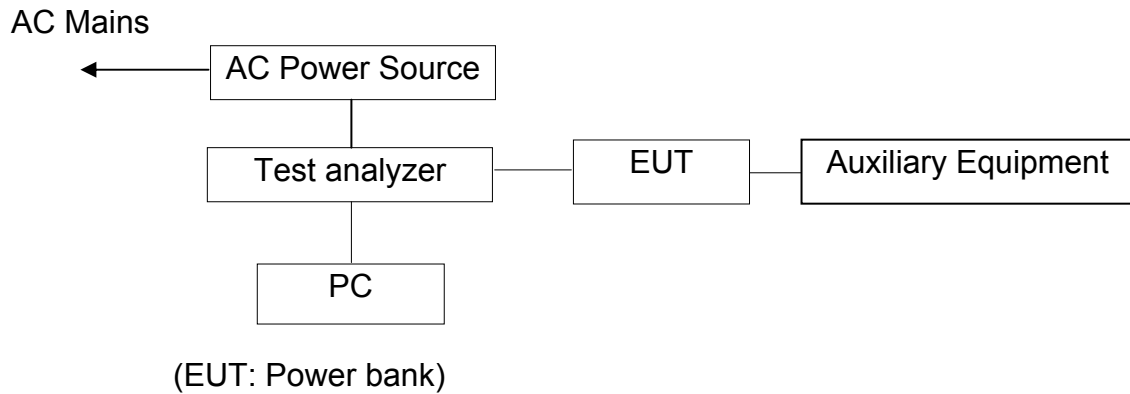
Note: Report NO.: ATE20171014



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	53.0056	51.64	-21.29	30.35	40.00	-9.65	QP			
2	78.8409	58.34	-22.07	36.27	40.00	-3.73	QP			
3	140.2829	58.10	-22.31	35.79	40.00	-4.21	QP			

6. HARMONIC CURRENT EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. Measuring Standard

EN 61000-3-2: 2014, CLASS A

6.3. Operation Condition of EUT

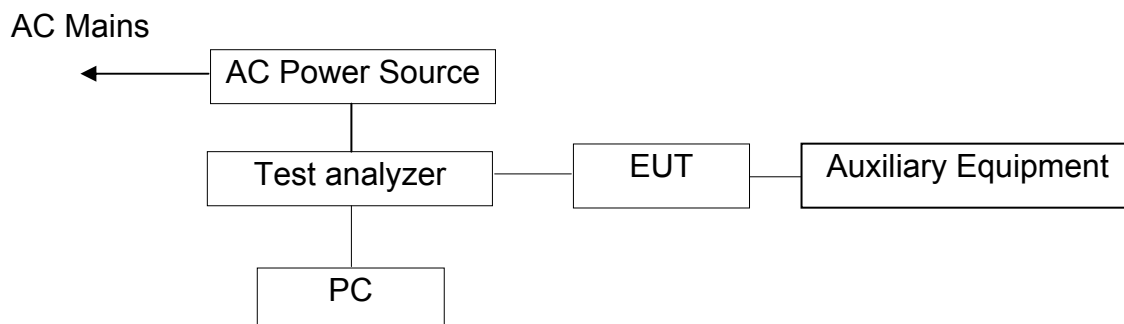
Same as Section 4.5 except the test setup replaced as Section 6.1.

6.4. Measuring Results

There is no connection to AC mains. Therefore, the test is not applicable and skipped.

7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1. Block Diagram of Test Setup



(EUT: Power bank)

7.2. Measuring Standard

EN 61000-3-3: 2013

7.3. Operation Condition of EUT

7.3.1. Setup the EUT as shown on Section 7.1.

7.3.2. Turn on the power of all equipments.

7.3.3. Let the EUT work in measuring mode (On/Off) measure it.

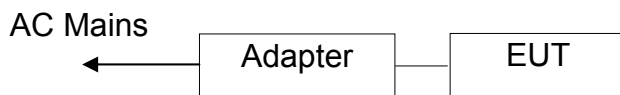
7.4. Measuring Results

There is no connection to AC mains. Therefore, the test is not applicable and skipped.

8. ELECTROSTATIC DISCHARGE IMMUNITY TEST

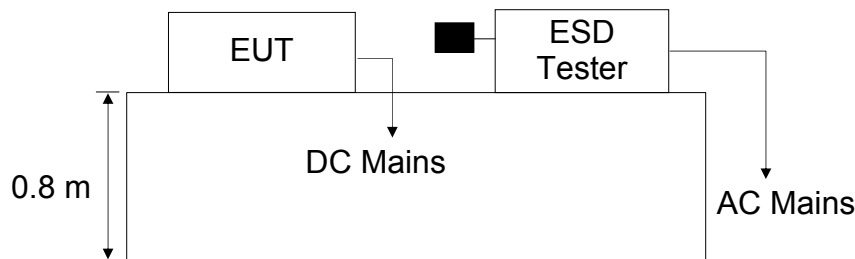
8.1. Block Diagram of Test Setup

8.1.1. Block diagram of connection between the EUT and simulators



(EUT: Power bank)

8.1.2. Block diagram of ESD test setup



(EUT: Power bank)

8.2. Test Standard

EN 55024: 2010 (IEC61000-4-2: 2008)

Severity Level: 3 / Air Discharge: $\pm 8\text{kV}$, Level: 2 / Contact Discharge: $\pm 4\text{kV}$

Testing shall also be satisfied at the lower levels

8.3. Severity Levels and Performance Criterion

8.3.1. Severity level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1.	± 2	± 2
2.	± 4	± 4
3.	± 6	± 8
4.	± 8	± 15
X	Special	Special

8.3.2. Performance Criterion: B

8.4.EUT Configuration

The configuration of EUT is listed in Section 4.4.

8.5.Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.5 except the test set up replaced by Section 8.1.

8.6.Test Procedure

8.6.1.Contact discharges to the conductive surfaces and to coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points (a minimum of 50 discharges at each point). One of the test points shall be subjected to at least 50 indirect discharges (contact) to the centre of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode [see IEC 61000-4-2 for use of the Vertical Conducting Plane (VCP)]. Tests shall be performed at a maximum repetition rate of one discharge per second.

8.6.2.Air discharge at slots and apertures, and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur; examples are openings at edges of keys, or in the cover of keyboards and telephone handsets. Such points are tested using the air discharge method. See also IEC 61000-4-2 regarding painted surfaces. This investigation should be restricted to those areas normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The application of electrostatic discharges to the contacts of open connectors is not required by this publication.

8.7.Test Results

PASS

Please refer to the following page.

Electrostatic Discharge Test Results

Accurate Technology Co., Ltd.

Manufacturer:		Test Date:	June 12, 2017
EUT:	Power bank	Temperature :	25℃
M/N:	LP-1005A	Humidity:	48%
Power Supply:	DC 5V	Test Mode:	Charging
Air discharge:	± 2kV; ± 4kV; ± 8kV	Criterion:	B
Contact discharge:	± 2kV; ± 4kV	Test Engineer:	Ding
Location		Kind A-Air Discharge C-Contact Discharge	Result
All non-conducted enclosure & Seam		A	PASS
All conducted enclosure & Seam		C	PASS
HCP		C	PASS
VCP of front		C	PASS
VCP of rear		C	PASS
VCP of left		C	PASS
VCP of right		C	PASS
Remark :		Test Equipment : ESD Simulator (HAEFELY, PESD1610)	

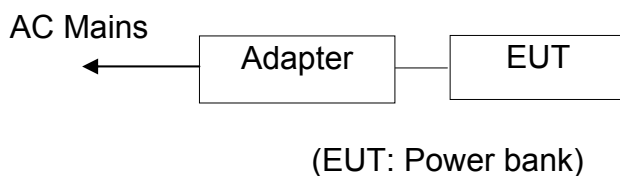
Accurate Technology Co., Ltd.

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Tel: +86-755-26503290 Fax: +86-755-26503396 E-mail: webmaster@atc-lab.com Http://www.atc-lab.com

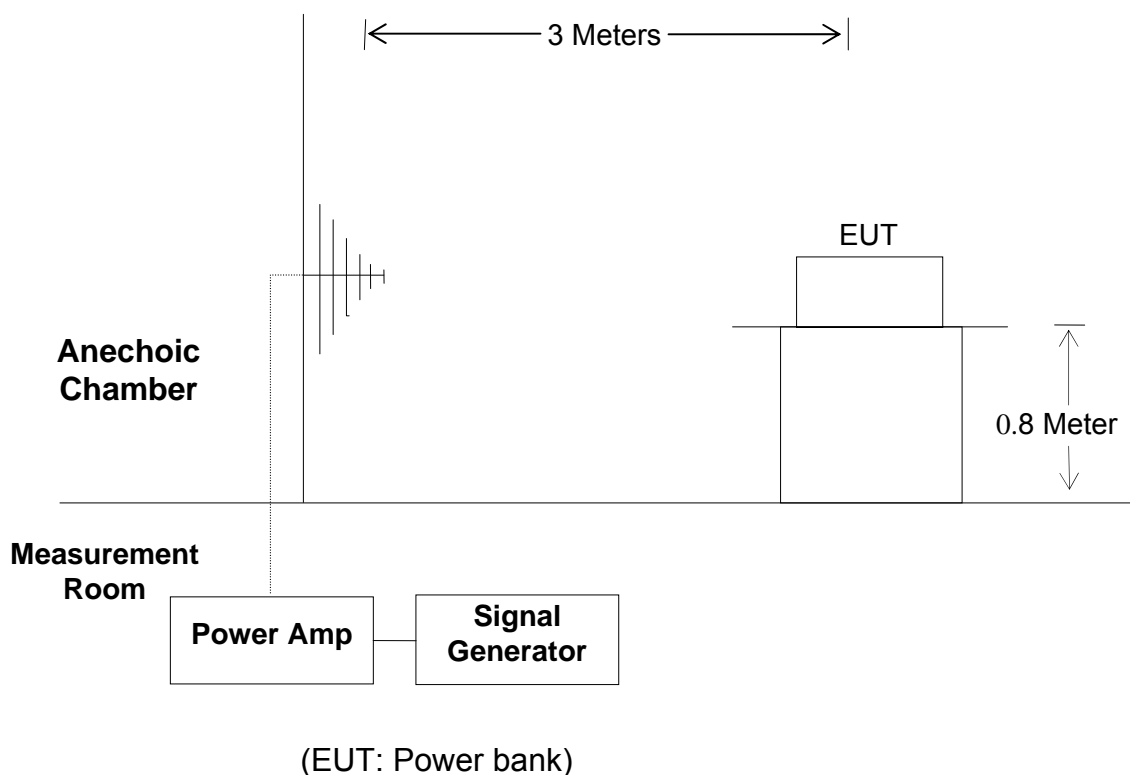
9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

9.1. Block Diagram of Test

9.1.1. Block diagram of connection between the EUT and simulators



9.1.2. Block diagram of R/S test setup



9.2. Test Standard

EN 55024: 2010

(IEC 61000-4-3: 2006+A1:2007+A2:2010, Severity Level: 2, 3V/m)

9.3. Severity Levels and Performance Criterion

9.3.1. Severity Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

9.3.2. Performance Criterion : A

9.4. EUT Configuration on Test

The configuration of the EUT is same as Section 4.4.

9.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.5 except the test set up replaced by Section 9.1.

9.6. Test Procedure

The EUT are placed on a table which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor its screen.

All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	3V/m (Severity Level 2)
2. Radiated Signal	Unmodulated
3. Scanning Frequency	80-1000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

9.7. Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Accurate Technology Co., Ltd.

Manufacturer:		Test Date : June 12, 2017	
EUT	: Power bank	Temperature	: 25°C
M/N	: LP-1005A	Humidity	: 50%
Field Strength	3 V/m	Criterion	: A
Power Supply	DC 5V	Test Mode	: Charging
Test Engineer:	SMQ	Frequency Range	80 MHz to 1000 MHz

Modulation:		<input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1kHz 80%	
	Frequency Range 1:80 - 1000MHz		Frequency Range 2:
Steps	# / %	# / %	
	Horizontal	Vertical	Horizontal Vertical
Front	PASS	PASS	
Right	PASS	PASS	
Rear	PASS	PASS	
Left	PASS	PASS	

Test Equipment :

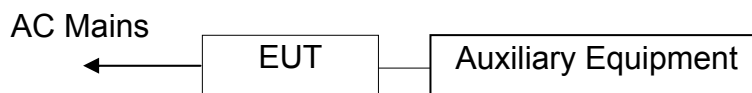
1. Signal Generator : SMT03 (Rohde & Schwarz)
2. Power Amplifier : 250W1000A (A&R)
3. Bilog Antenna : AT1080 (AR)

Note:

10. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

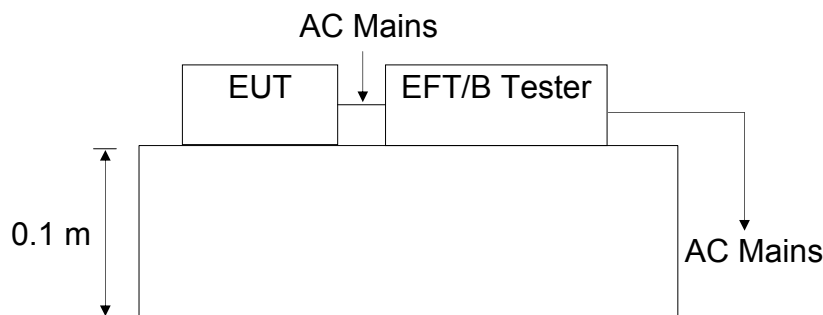
10.1. Block Diagram of Test Setup

10.1.1. Block Diagram of the EUT



(EUT: Power bank)

10.1.2. EFT/B Test Setup



(EUT: Power bank)

10.2. Test Standard

EN 55024: 2010
(IEC 61000-4-4: 2012 Severity Level, Level 2: 1kV & 0.5kV)

10.3. Severity Levels and Performance Criterion

10.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 kV	0.25 kV
2.	1 kV	0.5 kV
3.	2 kV	1 kV
4.	4 kV	2 kV
X	Special	Special

10.3.2. Performance Criterion: B

10.4.EUT Configuration

The configuration of EUT is listed in Section 4.4.

10.5.Operating Condition of EUT

10.5.1.Setup the EUT as shown in Section 10.1.

10.5.2.Turn on the power of all equipments.

10.5.3.Let the EUT work in test mode (On) and measure it.

10.6.Test Procedure

The EUT is put on the table which is 0.1 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

10.6.1.For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

10.6.2.For signal lines and control lines ports:

It's unnecessary to test.

10.6.3.For DC output line ports:

It's unnecessary to test.

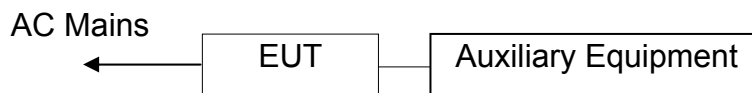
10.7.Test Result

There is no connection to AC mains. Therefore, the test is not applicable and skipped.

11.SURGE IMMUNITY TEST

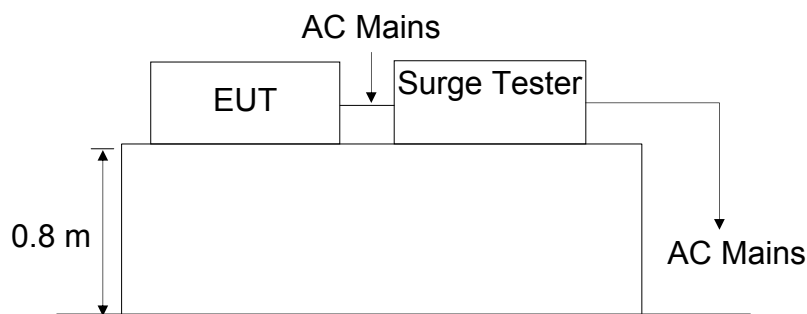
11.1.Block Diagram of Test Setup

11.1.1.Block Diagram of Test Setup



(EUT: Power bank)

11.1.2.Surge Test Setup



(EUT: Power bank)

11.2.Test Standard

EN 55024: 2010

(IEC 61000-4-5: 2005, Severity Level: Level 2, 1.0kV)

Testing shall also be satisfied at the lower levels

11.3.Severity Levels and Performance Criterion

11.3.1.Severity level

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

11.3.2.Performance Criterion : B

11.4.EUT Configuration

The configuration of EUT is listed in Section 4.4.

11.5.Operating Condition of EUT

11.5.1.Setup the EUT as shown in Section 11.1.

11.5.2.Turn on the power of all equipments.

11.5.3.Let the EUT work in test mode (On) and measure it.

11.6.Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.1.2.
- 2) For line to line coupling mode, provide a 1.0 kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

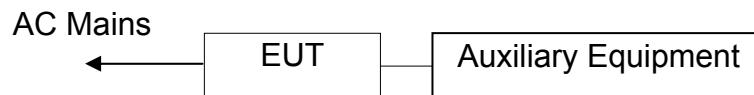
11.7.Test Result

There is no connection to AC mains. Therefore, the test is not applicable and skipped.

12. INJECTED CURRENTS SUSCEPTIBILITY TEST

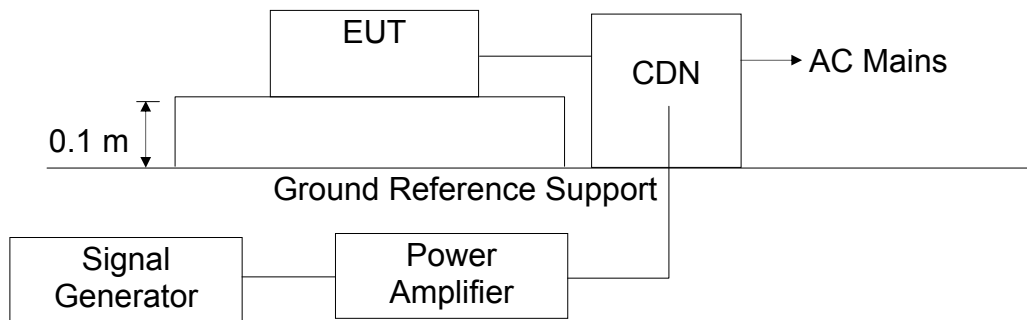
12.1. Block Diagram of Test Setup

12.1.1. Block Diagram of the EUT



(EUT: Power bank)

12.1.2. Block Diagram of AC mains



(EUT: Power bank)

12.2. Test Standard

EN 55024: 2010 (IEC 61000-4-6: 2009)
Severity Level 2: 3V (rms), 0.15MHz – 80MHz)

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

Level	Field Strength V(rms)
1.	1
2.	3
3.	10
X	Special

12.3.2. Performance Criterion: A

12.4.EUT Configuration

The configuration of EUT is listed in Section 4.4.

12.5.Operating Condition of EUT

12.5.1.Setup the EUT as shown in Section 12.1.

12.5.2.Turn on the power of all equipments.

12.5.3.Let the EUT work in test mode (On) and measure it.

12.6.Test Procedure

12.6.1.For AC Mains

- 1) Set up the EUT, CDN and test generators as shown on Section 12.1.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150kHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.6.2.For signal lines and control lines ports:

It's unnecessary to test.

12.6.3.For DC output line ports:

It's unnecessary to test.

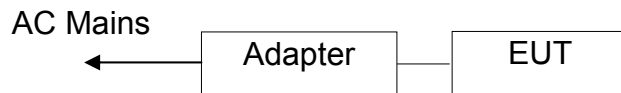
12.7.Test Results

There is no connection to AC mains. Therefore, the test is not applicable and skipped.

13.MAGNETIC FIELD SUSCEPTIBILITY TEST

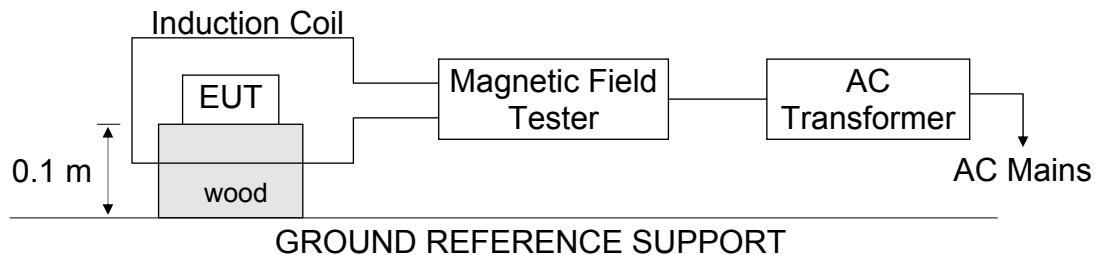
13.1.Block Diagram of Test

13.1.1.Block diagram of test setup



(EUT: Power bank)

13.1.2.Magnetic field test setup



(EUT: Power bank)

13.2.Test Standard

EN 55024: 2010

(IEC 61000-4-8: 2009, Severity Level: Level 1, 1A/m)

13.3.Severity Levels and Performance Criterion

13.3.1.Severity Level

Level	Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

13.3.2.Performance Criterion : A

13.4.EUT Configuration on Test

The configuration of the EUT is same as Section 4.4.

13.5.Operating Condition of EUT

13.5.1.Setup the EUT as shown in Section 13.1.

13.5.2.Turn on the power of all equipments.

13.5.3.Let the EUT work in test mode (Charging) and measure it.

13.6.Test Procedure

The EUT is placed in the middle of an induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarizations of the induction coil are set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

13.7.Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Result

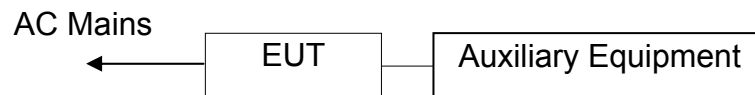
Accurate Technology Co., Ltd.

Standard	IEC 61000-4-8: 2009		Result: <input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail	
<p>Manufacturer : _____</p> <p>EUT : <u>Power bank</u> M/N: <u>LP-1005A</u></p> <p>Input Voltage : <u>DC 5V</u></p> <p>Date of Test : <u>June 12, 2017</u> Test Engineer: <u>Ding</u></p> <p>Ambient Condition : Temp : <u>25°C</u> Humidity: <u>48%</u></p> <p>Criterion : <u>A</u></p>				
Test Mode : Charging				
Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result
1	5 mins	Horizontal	A	PASS
1	5 mins	Vertical	A	PASS
Test Mode :				
Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result
Remark :		Test Equipment: Magnetic Field Tester MAG100 AC Transformer TDGC2J-5		
Note:				

14.VOLTAGE DIPS AND INTERRUPTIONS TEST

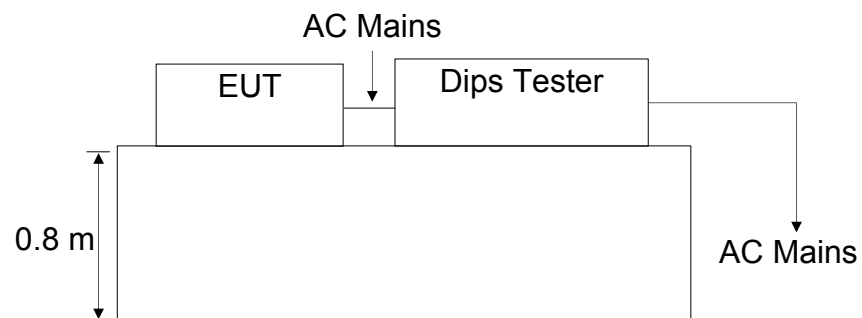
14.1.Block Diagram of Test Setup

14.1.1.Block Diagram of the EUT



(EUT: Power bank)

14.1.2.Dips Test Setup



(EUT: Power bank)

14.2.Test Standard

EN 55024: 2010 (IEC 61000-4-11: 2004)

14.3. Severity Levels and Performance Criterion

14.3.1. Severity level

Test Level %U _T	Voltage dip %U _T	Duration (in period)
0	100	0.5
70	30	25/30 ^c
Test Level %U _T	short interruptions %U _T	Duration (in period)
0	100	250/300 ^c

^c "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test"

14.3.2. Performance Criterion : B&C

14.4. EUT Configuration

The configuration of EUT is listed in Section 4.4.

14.5. Operating Condition of EUT

14.5.1. Setup the EUT as shown in Section 14.1.

14.5.2. Turn on the power of all equipments.

14.5.3. Let the EUT work in test mode (On) and measure it.

14.6. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 14.1.2.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

14.7. Test Result

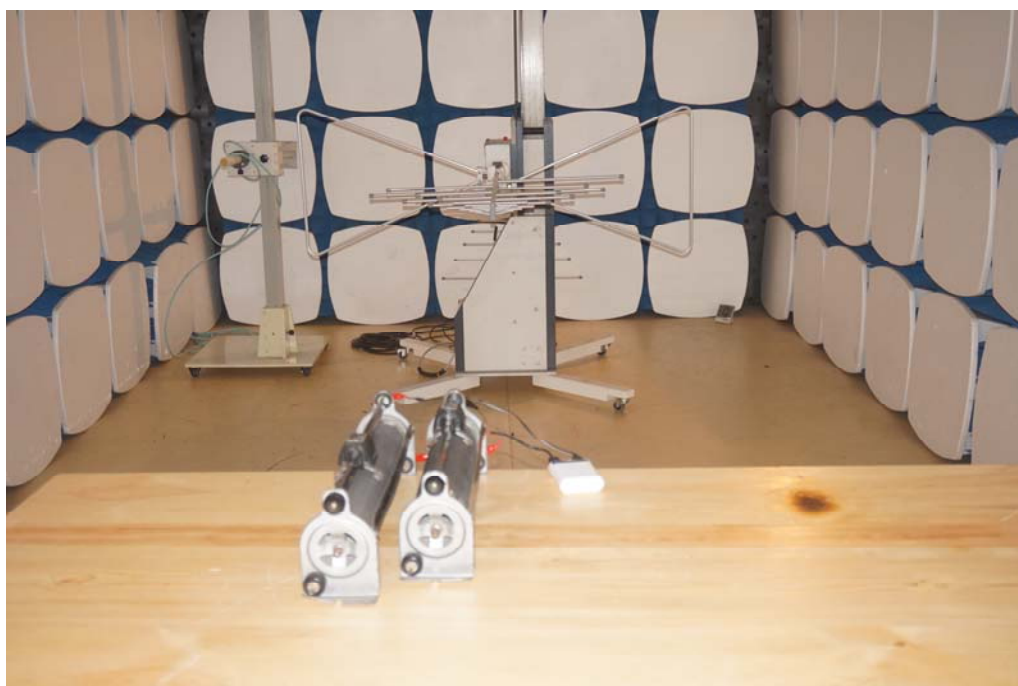
There is no connection to AC mains. Therefore, the test is not applicable and skipped.

15.PHOTOGRAPHS

15.1.Photo of Conducted Emission Measurement



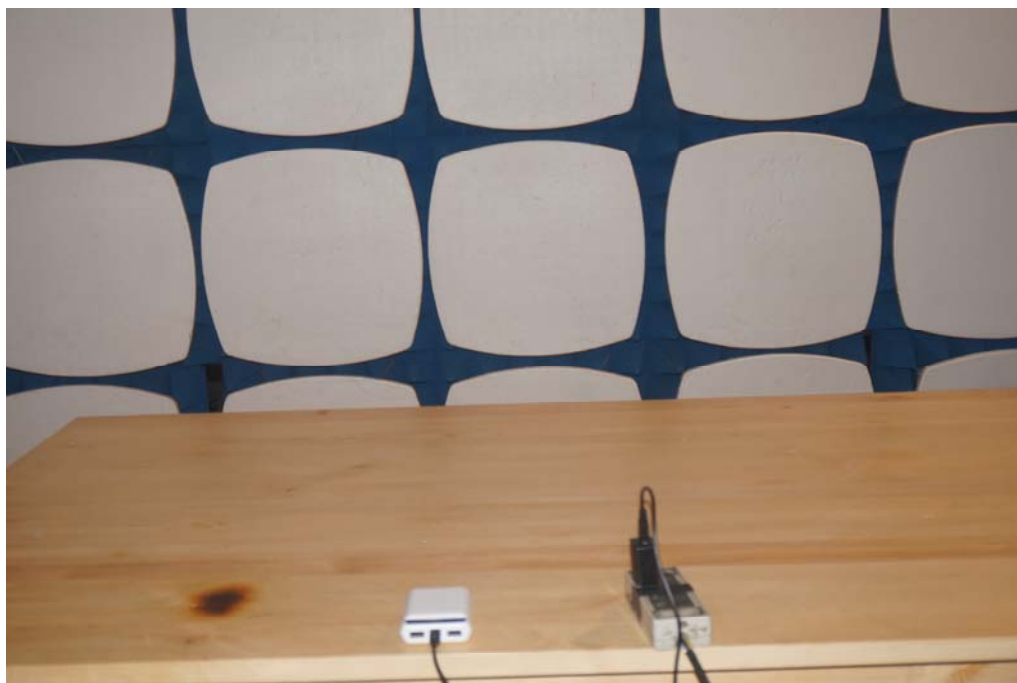
15.2.Photos of Radiation Emission Measurement



15.3.Photo of Electrostatic Discharge Test



15.4.Photo of RF Field Strength Susceptibility Test



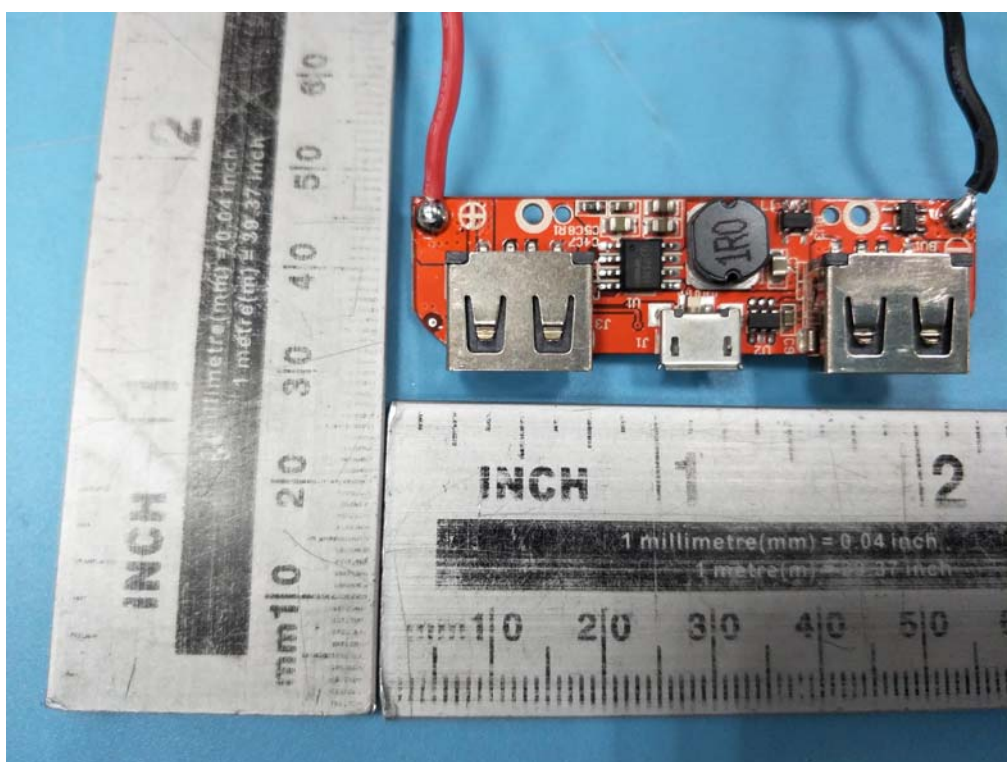
15.5.Photo_of Magnetic Field Susceptibility Test



15.6.Photo of EUT







Accurate Technology Co., Ltd.

Address: F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen 518057, P. R. China
Tel: +86-755-26503290 Fax: +86-755-26503396 E-mail: webmaster@atc-lab.com Http://www.atc-lab.com

