EMC Test Report

Application No.	:	TB150310000
Applicant	:	
Equipment Under Test (EUT)		
EUT Name	:	Portable charger with holder
Model No.	:	P324.60
Series Model No.	:	N/A
Brand Name	:	N/A
Receipt Date	:	2015-03-06
Test Date	:	2015-03-06 to 2015-03-27
Issue Date	:	2015-03-27
Standards	:	EN55022: 2010 Class B EN55024: 2010 Class B
Conclusions	:	**PASS**

In the configuration tested, the EUT complied with the standards specified above
The EUT technically complies with the 2004/108/EC directive requirements

Test/Witness Engineer :

Approved & Authorized :

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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1. General Information

1.1. Client Information

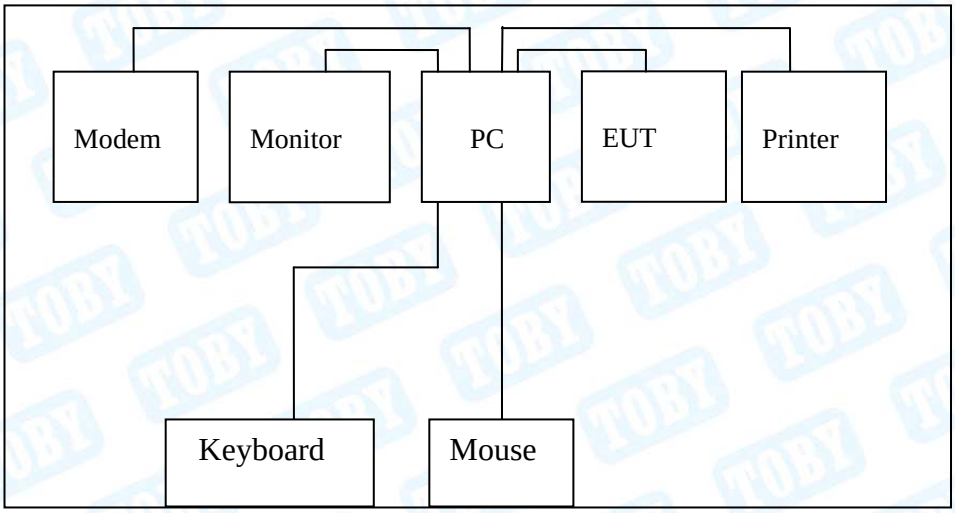
Applicant	:	
Address	:	
Manufacturer	:	
Address	:	

1.2. General Description of EUT (Equipment Under Test)

EUT Name	:	Portable charger with holder
Model No.	:	BM2171
Series Model No.	:	N/A
Brand Name	:	N/A
Power Supply	:	Input: DC 5V 1A Output-L: DC 5V 1A Output-H: DC 5V 2A CAPACITY: 10000mAh
Remark: /		

1.3. Block Diagram Showing The Configuration of System Tested

Model 1



Model 2



1.4. Description of Support Units

Name	Model	S/N	Manufacturer	Used "√"
Printer	HP1505n	VNF3G06957	HP	√
Modem	RX304Xv2	----	ASUS	√
LCD Monitor	E170Sc	----	DELL	√
PC	OPTIPLEX380	----	DELL	√
Keyboard	L100	U01C	DELL	√
Mouse	M-UARDEL7	----	DELL	√

1.5. Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is 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.

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.

1.6. Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)
The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)
The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)
The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

May 22, 2014 certificated by TUV Rheinland(China) Co., Ltd. with TUV certificate No.: UA 50282953 0001 and report No.: 17026822 002. The certificate is valid until the next scheduled audit or up to 18 months, at the discretion of TUV Rhineland.

2. TEST Results Summary

EMISSION		
Description of test items	**Standards**	**Results**
Conducted disturbance at mains terminals	EN 55022: 2010 Class B	N/A
Radiated Disturbance	EN 55022: 2010 Class B	Pass(2)
Harmonic current emissions	EN 61000-3-2: 2006+A1: 2009 +A2:2009	N/A
Voltage fluctuation and flicker	EN 61000-3-3: 2013	N/A
IMMUNITY		
Description of test items	**Standards**	**Results**
Electrostatic Discharge (ESD)	EN 61000-4-2: 2009	Pass
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A1:2008 +A2:2010	Pass
EFT/B Immunity	EN 61000-4-4: 2012	N/A
Surge Immunity	EN 61000-4-5: 2006	N/A
Conducted RF Immunity	EN 61000-4-6: 2009	N/A
Power frequency magnetic field	EN 61000-4-8: 2010	N/A(3)
Voltage dips, >95% reduction	EN 61000-4-11: 2004	N/A
Voltage dips, 30% reduction		
Voltage interruptions		

Note: N/A is an abbreviation for Not Applicable.

(1) For Harmonic Current the equipment power is less than 75W.

(2) The EUT maximum operating frequency is less than 108MHz, so no requirement for the radiated disturbance for above 1GHz.

(3) Not applicable, the EUT has not magnetic field.

3. Test Equipment Used

Radiation Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2014	Mar. 19, 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	DE25181	Aug. 08, 2014	Aug.07, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 08, 2014	Aug.07, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 06, 2015	Mar.07, 2016
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 06, 2015	Mar.07, 2016
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 06, 2015	Mar.07, 2016
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 06, 2015	Mar.07, 2016
Pre-amplifier	HP	11909A	185903	Mar. 06, 2015	Mar.07, 2016
Pre-amplifier	HP	8447B	3008A00849	Mar. 06, 2015	Mar.07, 2016
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 06, 2015	Mar.07, 2016
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Feb. 11, 2015	Feb.10, 2016
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Discharge Immunity Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
ESD Tester	TESEQ	NSG437	304	Aug. 10, 2014	Aug.09, 2015
ESD Generator	HAFELY	PESD 1610	H808671	Apr. 10, 2014	Apr. 09, 2015
Radiated Immunity Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Signal Generator	Rohde & Schwarz	SMT03	200754	Feb. 10, 2015	Feb. 09, 2016
Power Meter	Rohde & Schwarz	NRVD	110562	Feb. 10, 2015	Feb. 09, 2016
Voltage Probe	Rohde & Schwarz	URV5-Z2	12056	Feb. 10, 2015	Feb. 09, 2016
Voltage Probe	Rohde & Schwarz	URV5-Z2	12074	Feb. 10, 2015	Feb. 09, 2016
RF Amplifier	AR	50S1G4A	326720	Feb. 10, 2015	Feb. 09, 2016
Bilog Antenna	ETS	3142C	00047662	Feb. 10, 2015	Feb. 09, 2016
Horn Antenna	ARA	DRG-118A	16554	Feb. 10, 2015	Feb. 09, 2016

4. Radiated Emission Test

4.1. Test Standard and Limit

4.1.1. Test Standard

EN 55022: 2010 Class B

4.1.2. Test Limit

Bellow 1GHz

Frequency	Limit (dBμV/m) (3m)	
	Quasi-peak Level	
	Class A	Class B
30MHz~230MHz	50	40
230MHz~1000MHz	57	47
Remark: 1. The lower limit shall apply at the transition frequency. 2. The test distance is 3m.		

Above 1GHz

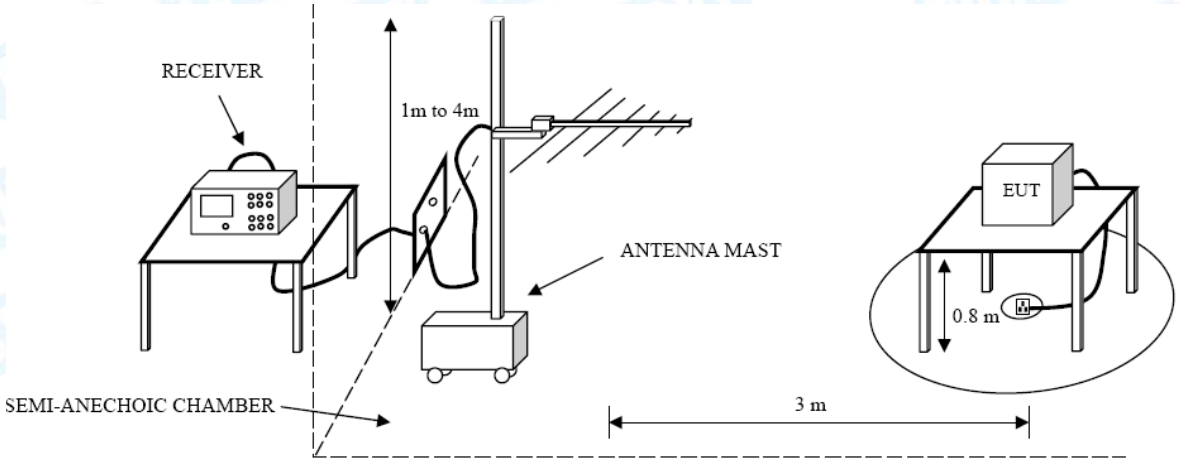
Frequency (GHz)	Limit (dBμV/m) (3m)			
	Class A		Class B	
	Peak	Average	Peak	Average
1~3	76	56	70	50
3~6	80	60	74	54
Remark: 1. The lower limit shall apply at the transition frequency. 2. The test distance is 3m.				

Note: According to EN 55022: 2010 Clause 6.2: Conditional testing procedure, the measurement frequency range shown in the following table:

Highest frequency generated or used within the EUT or on which the EUT operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Less than 108	1000
108~500	2000
500~1000	5000
Above 1000	5 times of the highest frequency or 6GHz, whichever is less

Remark: The EUT maximum operating frequency is less than 108MHz, so no requirement for the radiated disturbance for above 1GHz.

4.2. Test Setup



4.3. Test Procedure

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m. 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 radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range.

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.

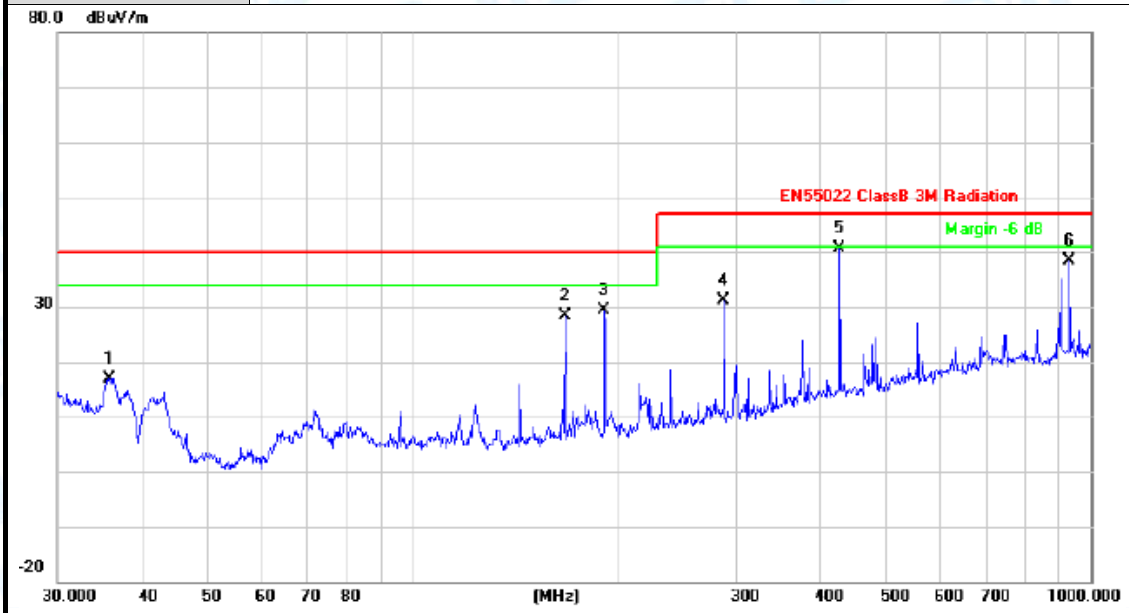
4.4. Test Condition

Temperature	:	25 ℃
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	DC 5V

4.5. Test Data

Please refer to the following pages.

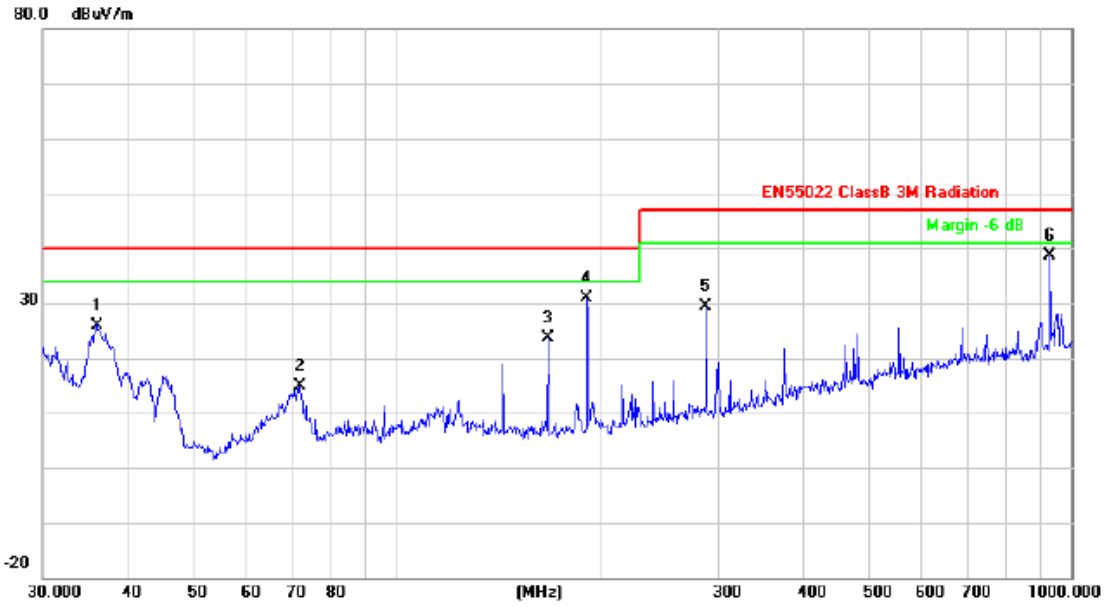
EUT:	Portable charger with holder	**Model Name :**	BM2171
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	Charging Mode		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		35.7490	34.51	-17.53	16.98	40.00	-23.02	peak
2		167.8243	49.31	-21.04	28.27	40.00	-11.73	peak
3		191.7450	50.30	-20.81	29.49	40.00	-10.51	peak
4		287.9904	48.49	-17.32	31.17	47.00	-15.83	peak
5	*	426.5210	53.59	-12.90	40.69	47.00	-6.31	peak
6		929.0082	43.28	-4.81	38.47	47.00	-8.53	peak

Emission Level= Read Level+ Correct Factor

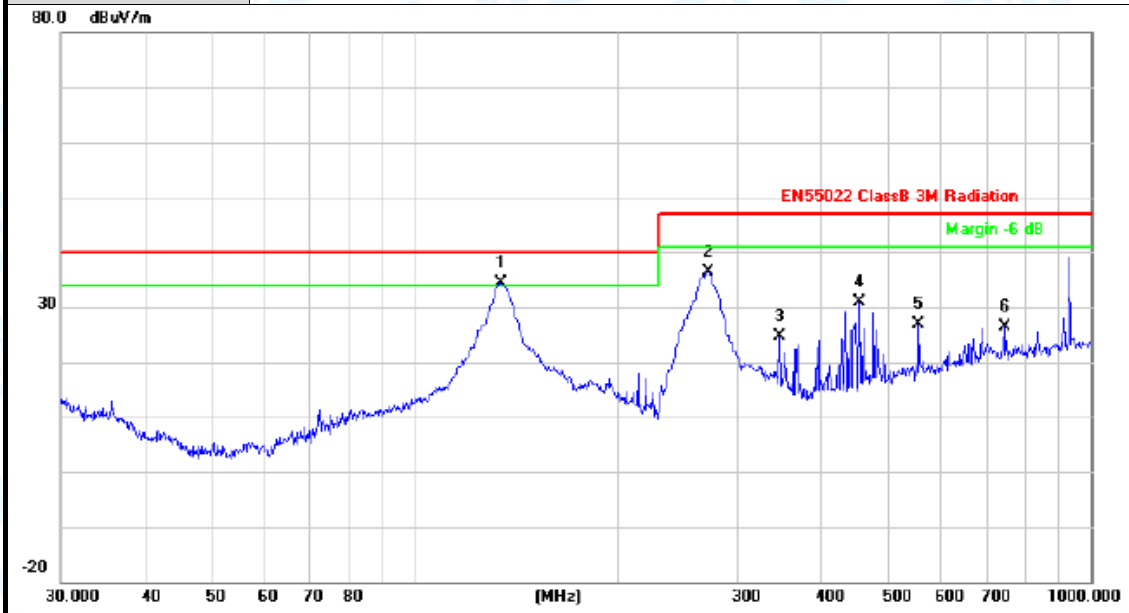
EUT:	Portable charger with holder	Model Name :	BM2171
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	Charging Mode		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		36.0007	43.67	-17.67	26.00	40.00	-14.00	peak
2		72.0843	38.31	-23.54	14.77	40.00	-25.23	peak
3		167.8243	44.69	-21.04	23.65	40.00	-16.35	peak
4		191.7450	51.64	-20.81	30.83	40.00	-9.17	peak
5		287.9904	46.73	-17.32	29.41	47.00	-17.59	peak
6	*	929.0082	43.50	-4.81	38.69	47.00	-8.31	peak

Emission Level= Read Level+ Correct Factor

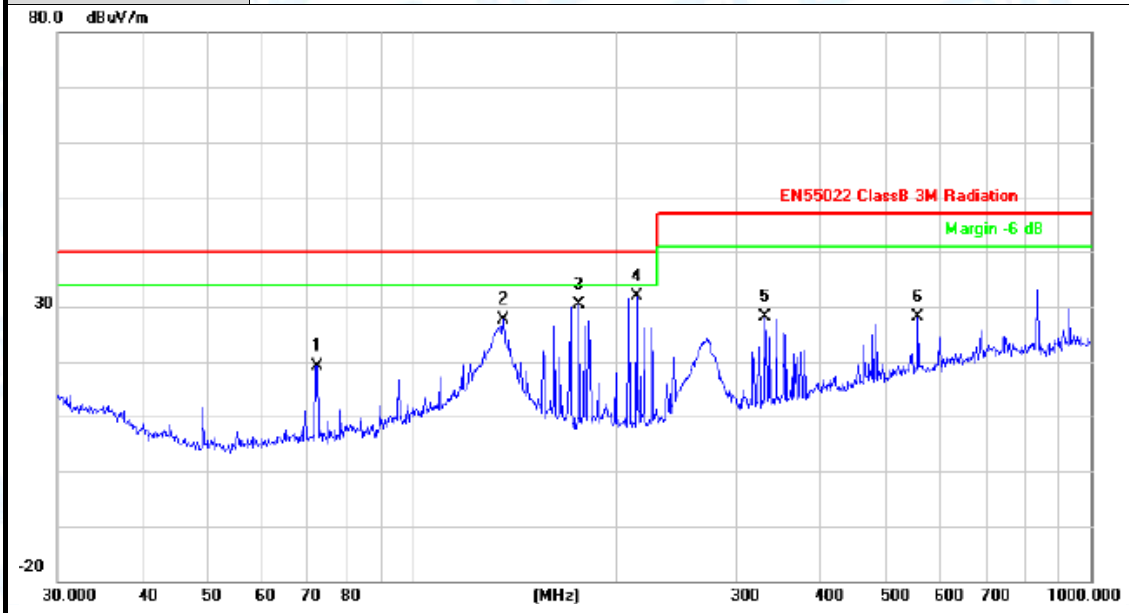
EUT:	Portable charger with holder	**Model Name :**	BM2171
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	Discharging Mode		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	134.0882	56.51	-22.09	34.42	40.00	-5.58	peak
2		271.3246	54.11	-17.65	36.46	47.00	-10.54	peak
3		346.8092	39.44	-14.81	24.63	47.00	-22.37	peak
4		454.3100	43.09	-12.31	30.78	47.00	-16.22	peak
5		556.7744	36.96	-10.12	26.84	47.00	-20.16	peak
6		744.8661	33.50	-7.09	26.41	47.00	-20.59	peak

Emission Level= Read Level+ Correct Factor

EUT:	Portable charger with holder	**Model Name :**	BM2171
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	Discharging Mode		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		72.3376	42.72	-23.53	19.19	40.00	-20.81	peak
2		135.9822	49.73	-22.06	27.67	40.00	-12.33	peak
3		176.2686	51.25	-20.80	30.45	40.00	-9.55	peak
4	*	213.7634	51.75	-19.79	31.96	40.00	-8.04	peak
5		330.1949	43.84	-15.82	28.02	47.00	-18.98	peak
6		556.7744	38.37	-10.12	28.25	47.00	-18.75	peak

Emission Level= Read Level+ Correct Factor

5. Electrostatic Discharge Immunity Test

5.1. Test Requirements

5.1.1. Test Standard

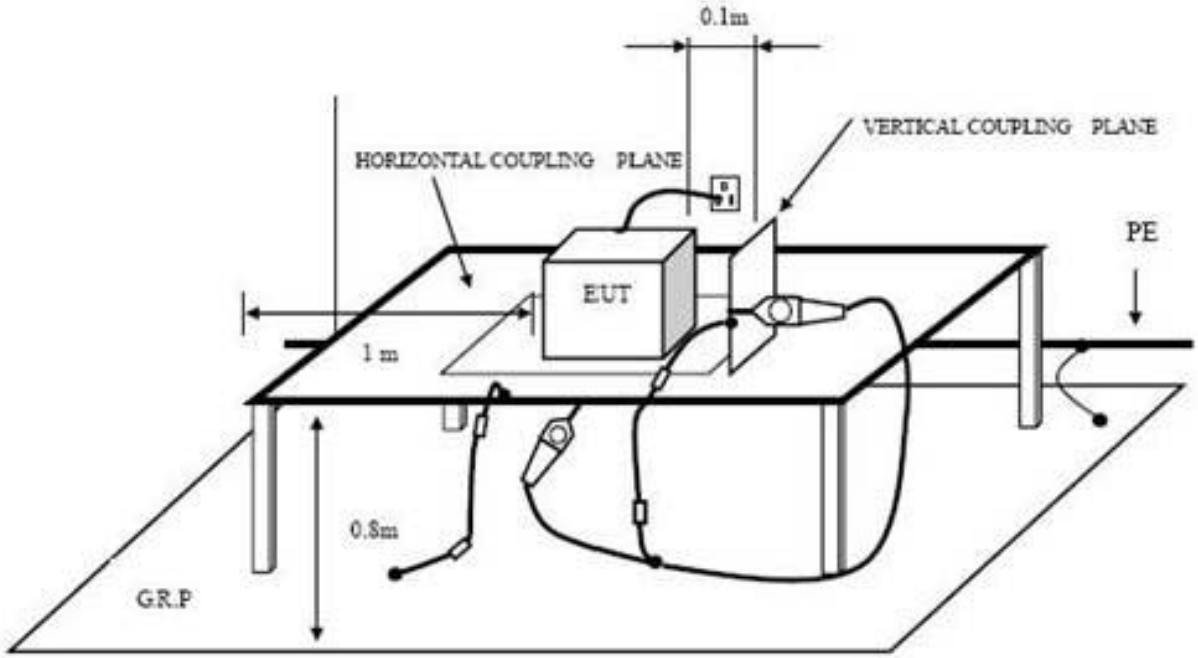
EN 55024:2010 (EN 61000-4-2:2009)

5.1.2. Test 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

5.1.3. Performance criterion: **B**

5.2. Test Setup



INDIRECT DISCHARGE SETUP

5.3. Test Procedure

5.3.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

5.3.2. Contact Discharge:

All the procedure shall be same as air discharge. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

5.3.3. Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

5.3.4. Indirect discharge for vertical coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

5.4. Test Data

Please refer to the following pages.

Electrostatic Discharge Test Result

EUT	: Portable charger with holder	M/N	: BM2171
Temperature	: 22℃	Humidity	: 50%
Power supply	: DC 5V	Test Mode	: Charging& Discharging

Criterion: B

Air Discharge: ±8kV Contact Discharge: ±4kV

For each point positive 10 times and negative 10 times discharge.

Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Nonconductive Enclosure	A	PASS
Slot of the EUT	A	PASS
USB Port	A	PASS
HCP	C	PASS
VCP of front	C	PASS
VCP of rear	C	PASS
VCP of left	C	PASS
VCP of right	C	PASS

6. Radiated Electromagnetic Field Immunity Test

6.1. Test Requirements

6.1.1. Test Standard

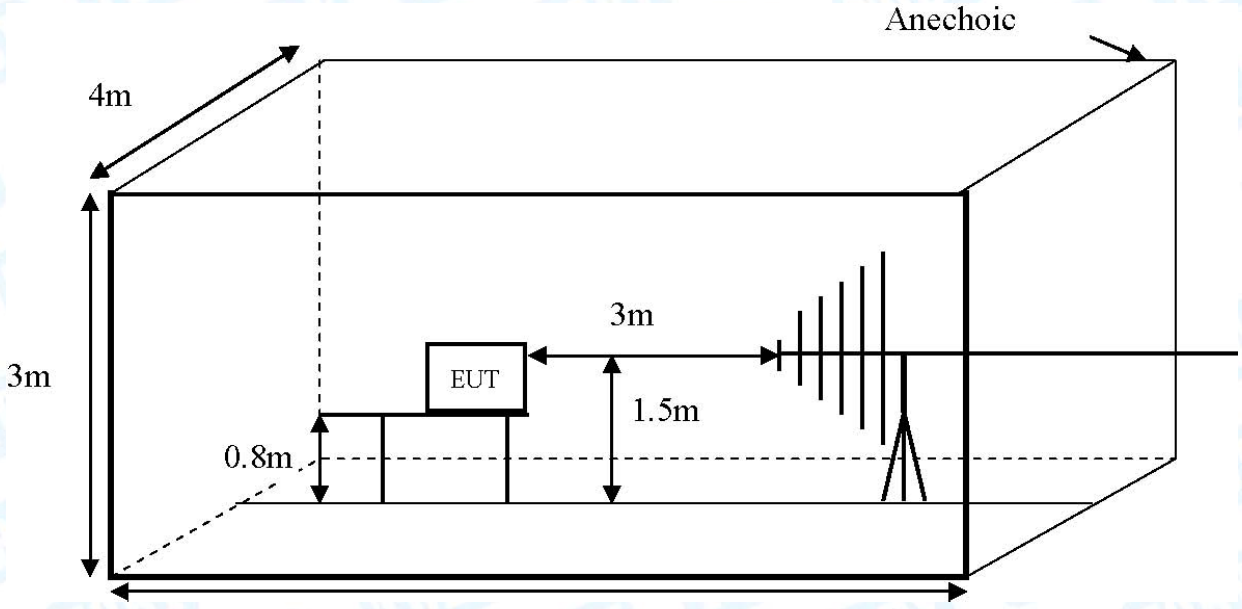
EN 55024:2010 (EN 61000-4-3:2006+A1:2008+A2:2010)

6.1.2. Test Level

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

6.1.3. Performance criterion: **A**

6.2. Test Setup



6.3. 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 polarization of the antenna is 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 camera is used to monitor its screen.

All the scanning conditions are as following:

Condition of Test	Remark
Fielded strength	3V/m (Severity Level 2)
Radiated signal	Modulated
Scanning frequency	80-1000MHz
Sweep time of radiated	0.0015 Decade/s
Dwell time	1 Sec.

6.4. Test Data

Please refer to the following pages.

RF Field Strength Susceptibility Test Results

EUT	: Portable charger with holder	M/N	: BM2171
Temperature	: 22℃	Humidity	: 50%
Power supply	: DC 5V	Test Mode	: Charging& Discharging

Criterion: A

Modulation: Unmodulated

Pulse: AM 1KHz 80%

	Frequency Range 1		Frequency Range 2	
	80~1000MHz			
	Horizontal	Vertical	Horizontal	Vertical
Front	PASS	PASS	/	/
Right	PASS	PASS	/	/
Rear	PASS	PASS	/	/
Left	PASS	PASS	/	/

Remark:

7. Photographs - Constructional Details

Photo 1 Appearance of EUT

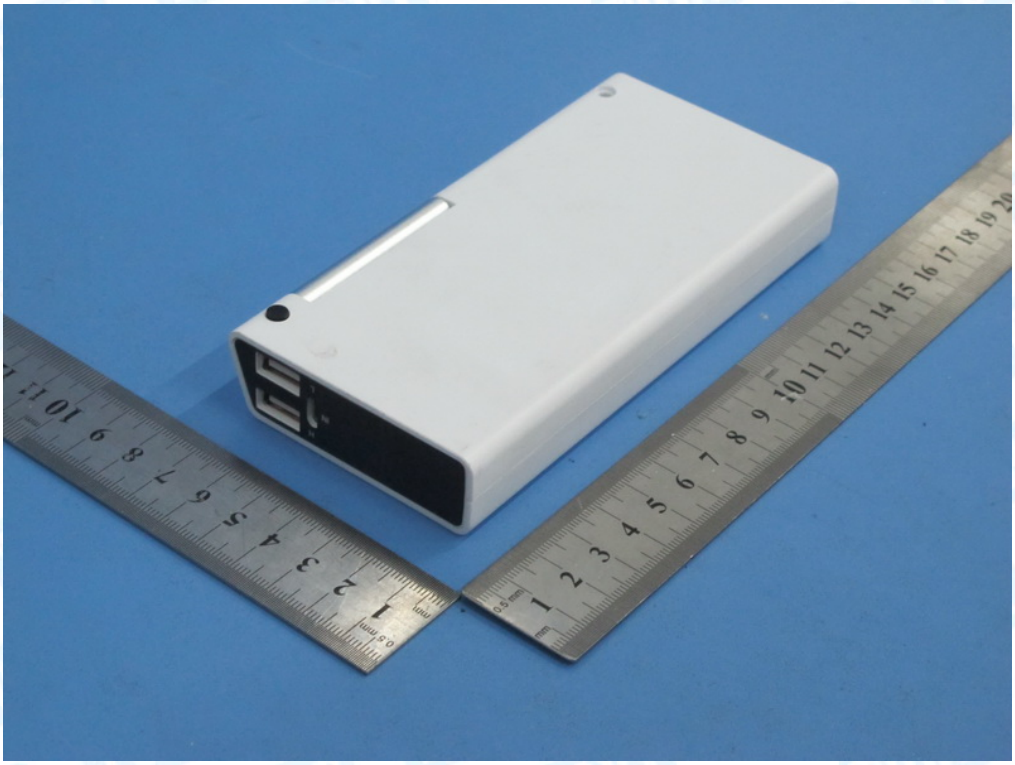


Photo 2 Appearance of EUT



Photo 3 Internal of EUT

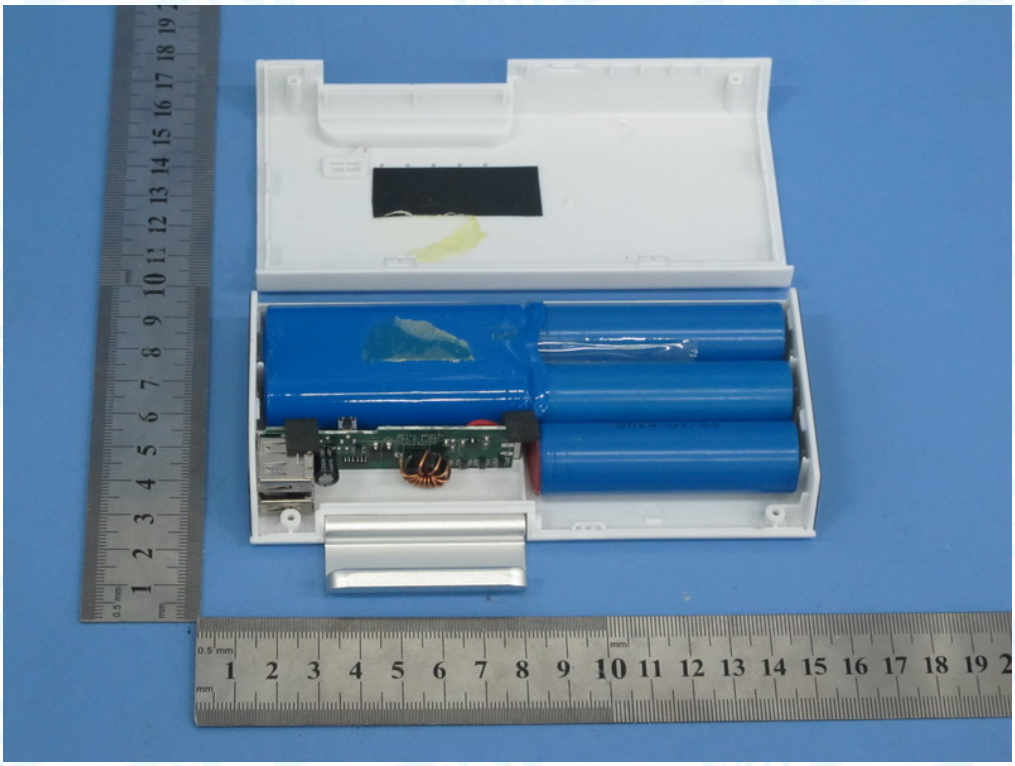


Photo 4 Appearance of PCB

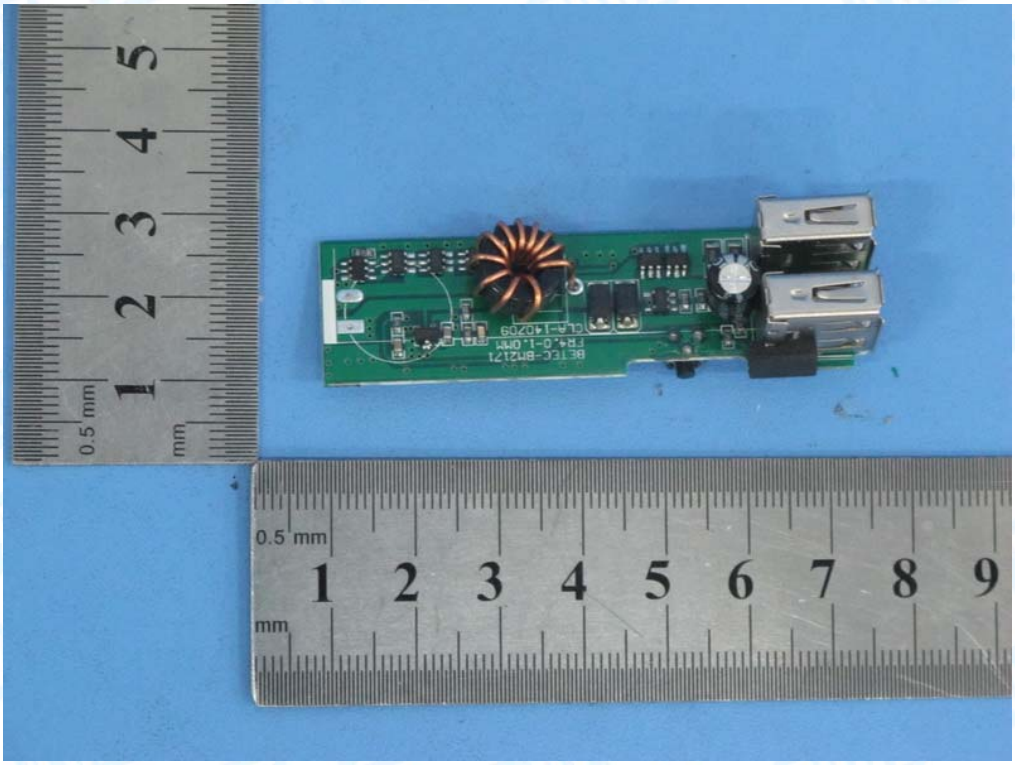
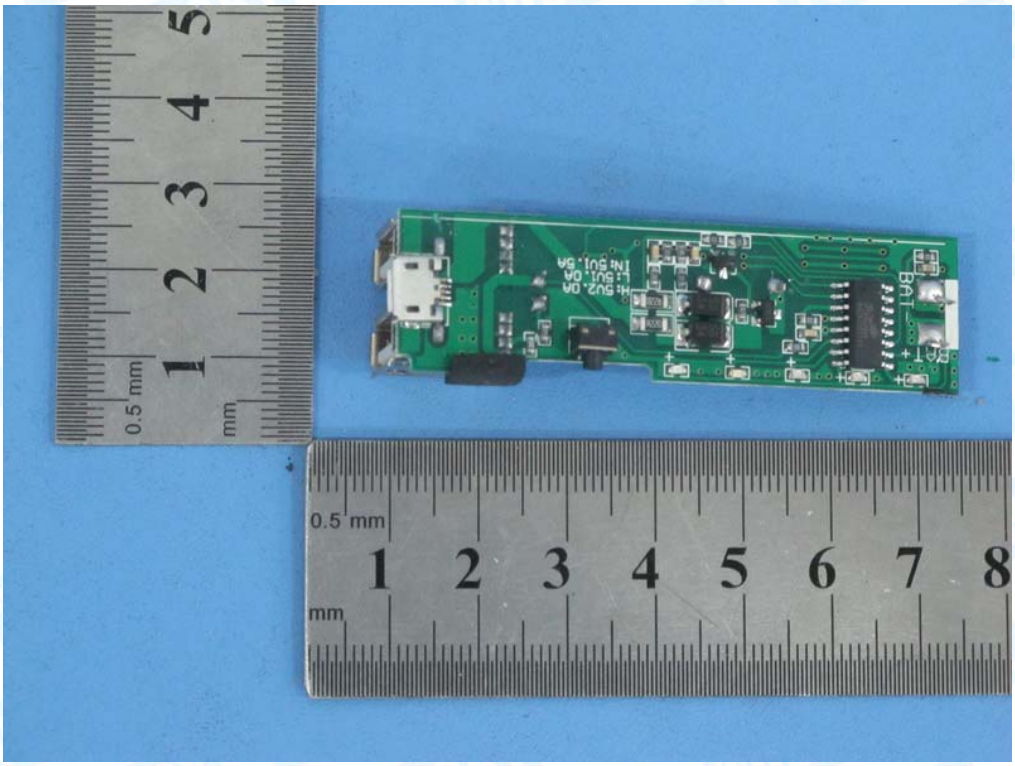


Photo 5 Appearance of PCB



8. Photographs – Test Setup

Photo 1 Radiated Emission Test Setup



Photo 2 Radiated Emission Test Setup

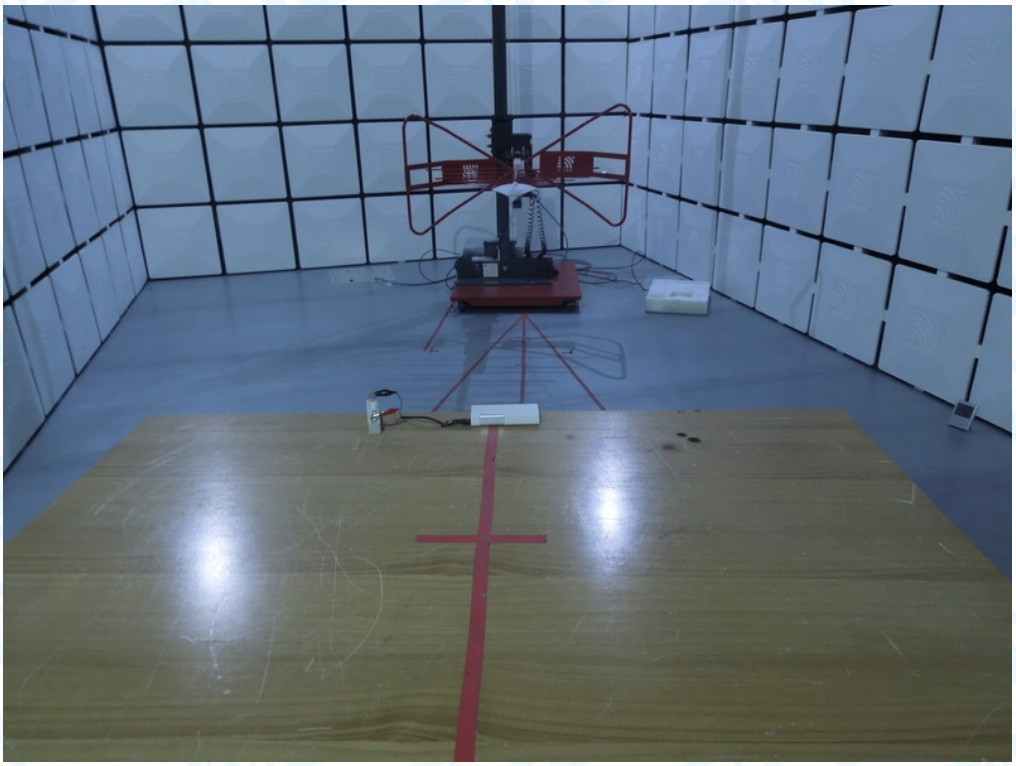


Photo 3 Electrostatic Discharge Test Setup

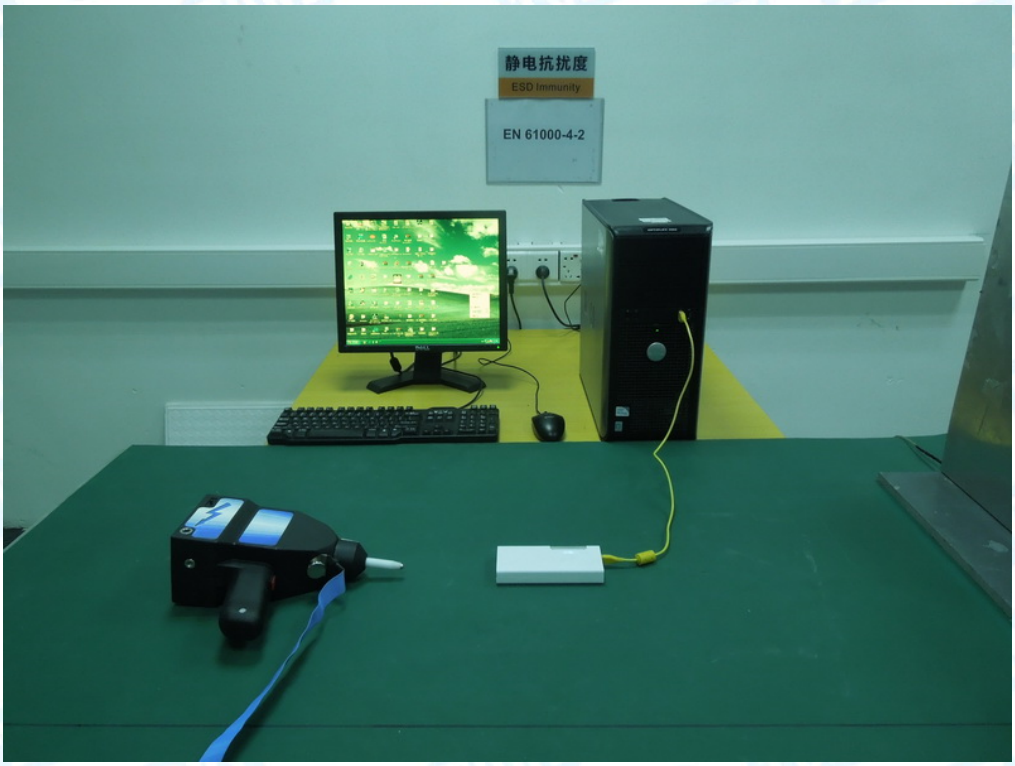


Photo 4 Electrostatic Discharge Test Setup

