



Report No.: T32020220021EM

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TEST REPORT

Application No.: T32020220021EM
Applicant: Safari Ltd
Address of Applicant: 5960 Miami Lakes Drive, Miami Lakes, FL 33016 USA
Equipment Under Test (EUT):
EUT Name: Energy Ball
Model No.: 100748
UPC: 095866994006
Standard(s) : EN 55014-1:2017
EN 55014-2:2015
Date of Receipt: 2020-02-26
Date of Test: 2020-02-28
Date of Issue: 2020-03-02

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

Law Man Kit
EMC Manager

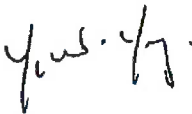

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

SGS Hong Kong Limited | Laboratory Unit 2 and 3, 6/F Block A, Pa Lung Centre, 11 Wang Chiu Road, Kwun Tong Bay, Kowloon, Hong Kong www.sgs.com hk
Office: Units 303 & 305, 3/F, Building 22E, Phase 3, HK Science Park, New Territories, Hong Kong T: (852) 2334 4481 F: (852) 2764 3125 e: my@sg.hk@sgs.com

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-03-02		Original

Authorized for issue by:			
			
	Yung Yuk Wah /Project Engineer		Date: 2020-02-28
			
	Law Man Kit /Reviewer		Date: 2020-03-02



2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Radiated Emissions (30MHz-1GHz)	EN 55014-1:2017	CISPR 16-2-3	Table 9	Pass

N/A: Not applicable

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 55014-2:2015	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass

N/A: Not applicable

The EUT belongs to Category B of EN 55014-1:2017

The EUT belongs to Category III of EN 55014-2:2015



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3V "LR41" size battery x2 pcs
Cable:	--

4.2 Description of Support Units

The EUT has been tested as an independent unit.



4.3 Measurement Uncertainty

EMI

No.	Item	Measurement Uncertainty
1	Radiated emission	5.1dB (30MHz-1GHz)
		4.9dB (1GHz-6GHz)

EMS

No.	Item	Measurement Uncertainty
1	ESD	5.7 %
2	Temperature test	$\pm 1^\circ\text{C}$
2	Humidity test	$\pm 3\%$
3	DC power test	$\pm 0.5 \%$

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cispr} (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

4.4 Test Location

All tests were performed at:

SGS Hong Kong Limited

Unit 2 and 3, G/F, Block A, Po Lung Centre,

11 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480

No tests were sub-contracted.

4.5 Test Facility

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

• **HOKLAS (Lab Code: 125)**

SGS IECC Limited has been accepted by HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a HOKLAS Accredited Laboratory, this laboratory meets the requirements of ISO/IEC 17025:2005 and it has been accredited for performing specific test as listed in the scope of accreditation within the test category of Electrical and Electronic Products.

• **FCC Recognized Accredited Test Firm (CAB Registration No.: 446297)**

SGS IECC Limited has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: HK0010, Test Firm Registration Number: 446297.

• **Industry Canada (Site Registration No.: 5193A; CAB Identifier No.: HK0001)**

SGS IECC Limited has been recognized by Department of Innovation, Science and Economic Development (ISED) Canada as a wireless testing laboratory. The acceptance letter from the ISED is maintained in our files. CAB Identifier No: HK0001, Site Registration Number: 5193A-2.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: Monitor the light of the EUT

Audio: Monitor the sound of the EUT

5 Equipment List

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ChamPro	N/A	E229	2019/8/9	2020/8/8
Coaxial Cable	SGS	N/A	E167	2019/7/22	2020/7/21
EMI Test Receiver 9kHz to 3.6GHz	Rohde & Schwarz	ESR3 / 102326	E231	2019/9/2	2020/9/1
TRILOG Super Broadb. Test Antenna, (25) 30-1000	Schwarzbeck	VULB 9168	E264	2018/10/20	2020/10/19
Boresight Mast Controller	ChamPro	AM-BS-4500-E	E237	--	--
Turntable with Controller	ChamPro	EM1000	E238	--	--

Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
ESD Generator	TESEQ AG	NSG 437	TE160	2019/5/20	2020/5/19

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Digital temperature & humidity data logger	SATO	SK-L200TH II	E232	2019/10/28	2020/10/27
Electronic Digital Thermometer with Hygrometer	nil	2074/2075	E159	2019/10/28	2020/10/27
Barometer with digital thermometer	SATO	7612-00	E218	2019/05/19	2020/05/18
Conditional Chamber - 40°C ~ +50°C	Zhong Zhi Testing Instruments	CZ-E-608D	E216	2019/08/22	2020/08/21

6 Emission Test Results

6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN 55014-1:2017

Test Method: CISPR 16-2-3

Frequency Range: 30MHz to 1GHz

Measurement Distance: 3m

Limit:

30MHz-230MHz 40 dB(μ V/m) quasi-peak

230MHz-1GHz 47 dB(μ V/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

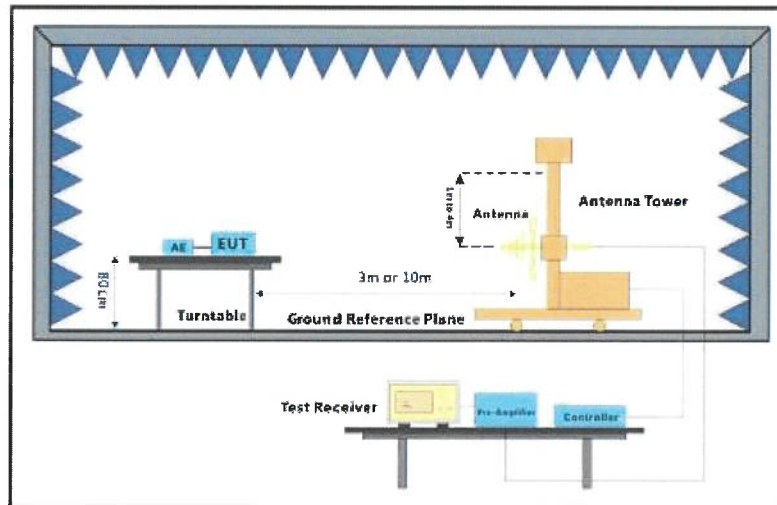
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 58 % RH :

Test mode a:Sound and flash light on

6.1.2 Test Setup Diagram

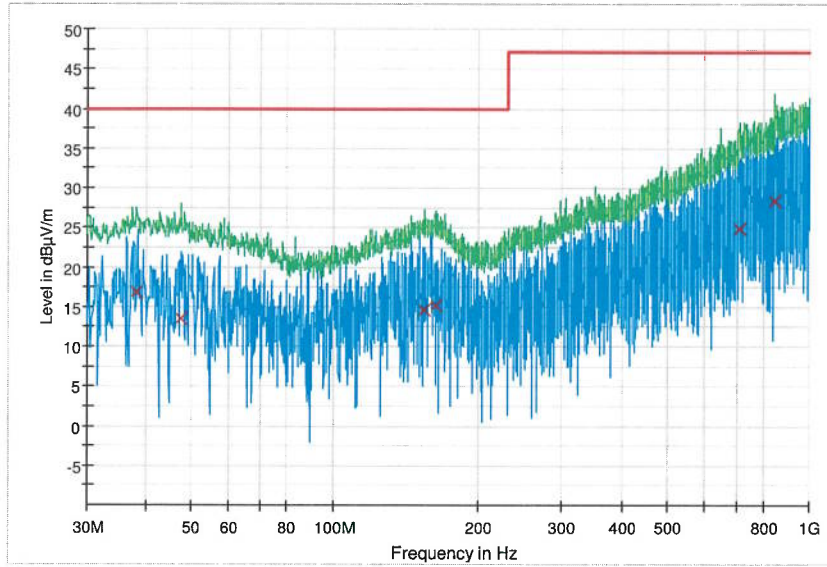


6.1.3 Measurement Data

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

Remark: Level = Read Level + Correction Factor + Cable Loss.

Mode:a
Horizontal:
Quasi-peak measurement:



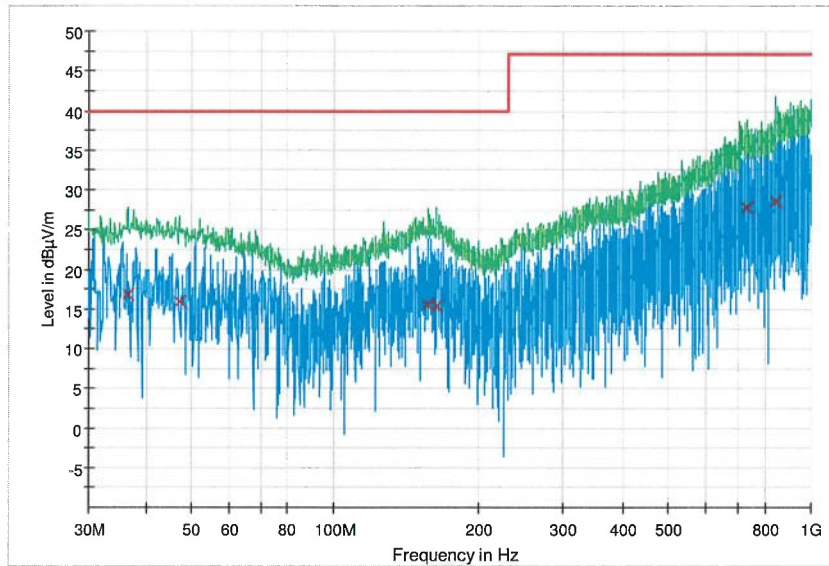
Frequency (MHz)	Pol.	QuasiPeak (dBuV/m)	Corr. (dB/m)	Limit (dBuV/m)	Margin	Result
38.245000	H	16.9	15.0	40.0	-23.1	PASS
47.557000	H	13.5	14.3	40.0	-26.5	PASS
154.257000	H	14.6	14.7	40.0	-25.4	PASS
163.375000	H	15.0	14.4	40.0	-25.0	PASS
710.067000	H	24.8	23.3	47.0	-22.2	PASS
844.897000	H	28.4	25.6	47.0	-18.6	PASS

Remark:

1. All readings are Quasi-Peak values.
2. Correction Factor = Antenna Factor + Cable Loss.
3. Pol. = antenna polarization

Vertical:

Quasi-peak measurement:



Frequency (MHz)	Pol.	QuasiPeak (dBuV/m)	Corr. (dB/m)	Limit (dBuV/m)	Margin	Result
36.499000	V	16.8	14.5	40.0	-23.2	PASS
47.072000	V	15.8	14.4	40.0	-24.2	PASS
156.488000	V	15.6	14.7	40.0	-24.4	PASS
162.793000	V	15.2	14.4	40.0	-24.8	PASS
733.735000	V	27.7	23.9	47.0	-19.3	PASS
844.897000	V	28.6	25.6	47.0	-18.4	PASS

Remark:

1. All readings are Quasi-Peak values.
2. Correction Factor = Antenna Factor + Cable Loss.
3. Pol. = antenna polarization

7 Immunity Test Results

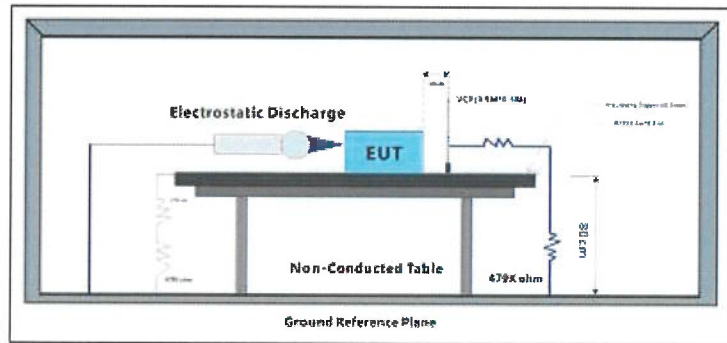
Performance Criteria Description in EN 55014-2:2015

- Criterion A** The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if used as intended.
- Criterion B** The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and from what the user may reasonably expect from the apparatus if used as intended.
- Criterion C** Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

7.1 Electrostatic Discharge

Test Requirement: EN 55014-2:2015
 Test Method: EN 61000-4-2:2009
 Performance Criterion: B
 Discharge Impedance: 330Ω/150pF
 Number of Discharge: Minimum 10 times at each test point
 Discharge Mode: Single Discharge
 Discharge Period: 1 second minimum

7.1.1 Test Setup Diagram



7.1.2 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C Humidity: 58.1 % RH Atmospheric Pressure: 1015 mbar

Test mode: a: Sound and flash light on

7.1.3 Test Results:

Observations: Test Point:

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

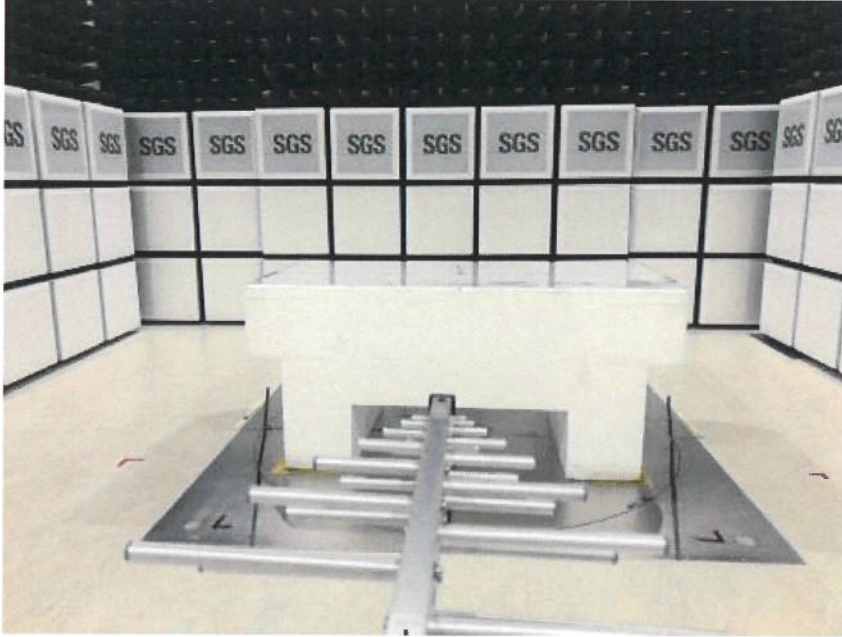
Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	8	+	1	A
Air Discharge	8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

Results:

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

8 Photographs

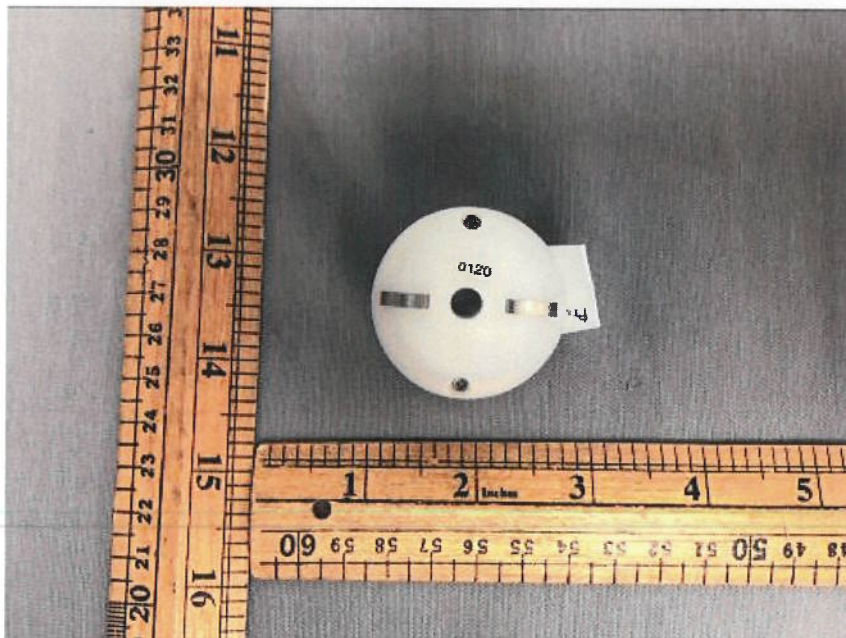
8.1 Radiated Emissions (30MHz-1GHz) Test Setup



8.2 Electrostatic Discharge Test Setup



8.3 EUT Constructional Details (EUT Photos)



- End of the Report -

EC DECLARATION OF CONFORMITY

Applicant / Importer certifies that the following designated product

Product Name: Energy Ball

Model No.: 100748

Is in fully conformity with the harmonized standard(s)

EN 55014-1:2017
EN 55014-2:2015

Under the Council Directive

2014/30/EU on Electromagnetic Compatibility

**The designated product was subject to sample testing for which
SGS issued test report number:**

T32020220021EM

The declaration is the sole responsibility of the applicant / importer

Safari Ltd
5960 Miami Lakes Drive, Miami Lakes, FL 33016 USA

Date

Signature & Company stamp