



**SGS-CSTC Standards
Technical Services Ltd.**



1/F., Building No. 1 Building, Agriculture Machinery Materials Co.
Wushan Road, Shipai, Tianhe District, Guangzhou, China
Telephone: +86 (0) 20 3848 1001 Fax: +86 (0) 20 3848 1006
kent_hsu@sgs.com

FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: 03.09.1560EF-1
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FCC ID: Q6N001PB

FCC TEST REPORT

Application No. : 03.09.1560EF
Applicant : EDU-SCIENCE (H.K.) LTD
FCC ID : Q6N001PB

Fundamental Frequency : 27.195MHz

Equipment under Test (EUT):

Name : Techball
Model : 20021 / PB001♣

♣ Please refer to section 3.1 of this report which indicates which model was actually tested and which models are electrically identical

Standards : FCC PART 15, SUBPART C : 2002

Date of Receipt : 29 August 2003

Date of Test : 03 September 2003

Date of Issue : 08 September 2003

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

Authorized Signature:

Kent Hsu
Laboratory Manager
SGS-CSTC Co.,Ltd.

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf
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 and does not permit the use of the SGS PRODUCT CERTIFICATION MARK.. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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3 General Information

3.1 Client Information

Applicant: EDU-SCIENCE (H.K.) LTD

Address of Applicant: Suite 701, 7/W Wing On Plaza, 62 Mody Road, T.S.T. East,
Kowloon, HongKong

3.2 Details of E.U.T.

Product Name: Techball (Transmitter Part)

Model: 20021 / PB001 ♣

♣ Only one item was tested since the above 2 Items were electrically identical. They are the same samples with different item no. only.

Power Supply: 9V DC (1 x '6F22' Battery)

Power Cord: N/A-

3.3 Description of Support Units

The EUT was tested as an independent unit: a 27MHz radio transmitter.

3.4 Test Location

All tests were performed at:-

SGS-CSTC Standards Technical Services Ltd., Guangzhou Safety & EMC Laboratory, 1/F,
Building No. 1, Agriculture Machinery Materials Company Warehouse Ltd., Wushan Road Shipai,
Tianhe District, Guangzhou, China. P.C. 510630.

Tel: +86 20 3848 1001

Fax: +86 20 3848 1006

3.5 Other Information Requested by the Customer

None.

3.6 Test Facility

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

- **NVLAP – Lab Code: 200611-0**
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 2000611-0. Effective through February 2, 2003.
- **ACA**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.
Date of Registration: February 28, 2003. Valid until May 30, 2005
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FINKO**
Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP, SGS-CSTC is an authorized test laboratory for the DoC process.

4 Test Results

4.1 Test Instruments

Test Equipment	Manufacturer	Model	Asset No.	Cal. Due Date
Temperature, Humidity & Barometer	Oregon Scientific	BA-888	EMC0003	30-06-2004
3m Semi- Anechoic Chamber	Frankonia	N/A	EMC0501	04-11-2003
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	EMC0506	17-11-2003
Bilog Type Antenna	Schaffner Chase	CBL6143	EMC0519	01-12-2003
Coaxial cable	SGS	N/A	EMC0514	04-11-2003

4.2 E.U.T. Operation

Input voltage: 9V DC (1 x '6F22' Battery)

Operating Environment:

Temperature: 24.0 °C

Humidity: 56 % RH

Atmospheric Pressure: 1012 mbar

EUT Operation:

Test the EUT in transmitting mode.

4.3 Test Procedure & Measurement Data

4.3.1 Radiated Emissions

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.227

Test Date: 03 September 2003

Measurement Distance: 3m (Semi-Anechoic Chamber)

Requirements: Carrier frequency will not exceed 80dBuV/m AT 3m.

Out of band emissions shall not exceed:

40.0 dB μ V/m between 30MHz & 88MHz

43.5 dB μ V/m between 88MHz & 216MHz

46.0 dB μ V/m between 216MHz & 960MHz

54.0 dB μ V/m above 960MHz

Detector: Peak Scan (120kHz resolution bandwidth)

Test Procedure: The procedure used was ANSI Standard C63.4-2001. The receiver was scanned from 30MHz to 1000MHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. The worst case emissions were reported.

The following measurements were performed on the EUT on 03 September 2003:
 Test the EUT in transmitting mode.

Intentional emission

Test Frequency (MHz)	Peak (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
27.195	72.2	63.4	100.0	27.8	36.6

Test Frequency (MHz)	Average (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
27.195	66.9	58.6	80.0	13.1	21.4

Other emissions

Test Frequency (MHz)	Quasi-Peak (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
54.390	30.1	20.8	40.0	9.9	19.2
81.585	31.5	19.2	40.0	8.5	20.8
108.780	28.2	17.9	43.5	15.3	25.6
135.975	22.8	24.2	43.5	20.7	19.3
163.170	22.5	23.9	43.5	21.0	19.6
190.365	18.8	21.6	43.5	24.7	21.9
217.560	21.5	22.3	46.0	24.5	23.7
244.755	22.6	20.3	46.0	23.4	25.7
271.950	23.5	21.6	46.0	22.5	24.4

Test Results: The unit does meet the FCC Part 15 C requirements.

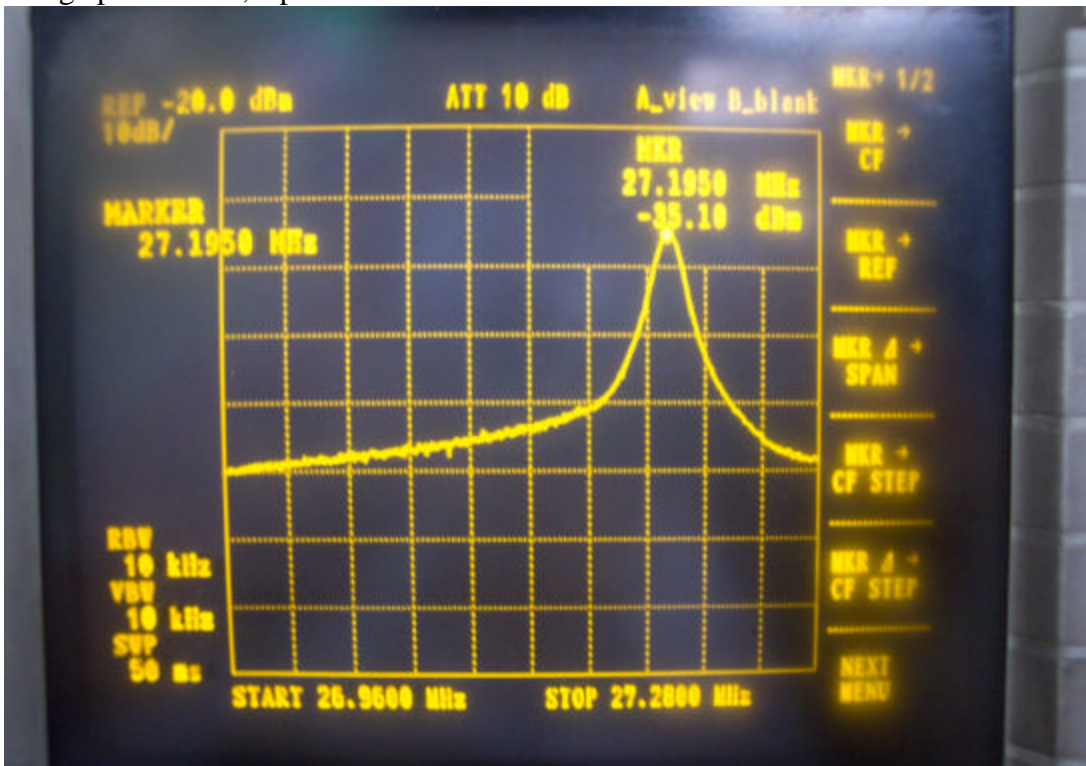
4.3.2 Occupied Bandwidth

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.227:
Operation within the band 26.96 – 27.28 MHz
Test Date: 03 September 2003

Requirements: The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

Method of measurement: The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to -10dB per division. The horizontal scale is set to 5KHz per division.

The graph as below, represents the emissions take for this device.



The results: The unit does meet the FCC Part 15 C requirements.