



## 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  
Email: sgs\_internet\_operations@sgs.com

FEDERAL COMMUNICATIONS COMMISSION  
Registration number: 282399

Report No.: GLEMO050100258RFF(I)  
Page: 1 of 11  
FCC ID: Q6N137ELB

# FCC TEST REPORT

**Application No. :** GLEMO050100258RF  
**Applicant:** EDU-SCIENCE (HK) LIMITED  
**FCC ID:** Q6N137ELB  
**Fundamental Carrier Frequency :** 49.860 MHz  
**Equipment Under Test (EUT):**  
    Name: Wireless Ultralite (Transmitter & Receiver)  
    Model: EL137  
**Standards:** FCC PART 15, SUBPART C : 2004  
**Date of Receipt:** 28 January 2005  
**Date of Test:** 1 to 2 February 2005  
**Date of Issue:** 4 February 2005

<b>Test Result :</b>	<b>PASS *</b>
----------------------	---------------

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Kent Hsu  
Laboratory Manager

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.  
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.  
All test results in this report can be traceable to National or International Standards.



## 2 Contents

	Page
<b>1 COVER PAGE.....</b>	<b>1</b>
<b>2 CONTENTS .....</b>	<b>2</b>
<b>3 GENERAL INFORMATION.....</b>	<b>3</b>
3.1 CLIENT INFORMATION .....	3
3.2 DETAILS OF E.U.T. ....	3
3.3 DESCRIPTION OF SUPPORT UNITS .....	3
3.4 TEST LOCATION.....	3
3.5 OTHER INFORMATION REQUESTED BY THE CUSTOMER .....	3
3.6 TEST FACILITY.....	4
<b>4 TEST RESULTS.....</b>	<b>5</b>
4.1 TEST INSTRUMENTS .....	5
4.2 E.U.T. OPERATION .....	5
4.3 TEST PROCEDURE & MEASUREMENT DATA .....	5
4.3.1 Radiated Emissions .....	5
4.3.2 Occupied Bandwidth .....	8
4.3.3 Photographs - Radiated Emission Test Setup in Chamber .....	9
<b>5 PHOTOGRAPHS - EUT CONSTRUCTIONAL DETAILS.....</b>	<b>10-11</b>



### **3 General Information**

#### **3.1 Client Information**

Applicant Name: EDU-SCIENCE (HK) LIMITED

Applicant Address: Suite 701-703 Wing On Plaza TST East, Kowloon Hong Kong.

#### **3.2 Details of E.U.T.**

Product Name: Wireless Ultralite (Transmitter Part)

Model: EL137

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

Inside Rechargeable Battery for Rx

Power Cord: N/A-

#### **3.3 Description of Support Units**

The EUT was tested as an independent unit: a 49.860MHz radio transmitter.

#### **3.4 Test Location**

All tests were performed at:-

SGS-CSTC Standards Technical Services Ltd., Guangzhou 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: 200611-0. Effective through December 31, 2004.
- **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-FIMKO**  
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's accreditation, SGS-CSTC is an authorised test laboratory for the DoC process.  
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.
- **Industry Canada (IC)**  
The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5169.

## 4 Test Results

### 4.1 Test Instruments

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date
3m Semi- Anechoic Chamber	Frankonia	N/A	N/A	15-02-2005
EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	04-11-2004
EMI Test Software	Rohde & Schwarz	ES-K1	N/A	N/A
Coaxial cable	SGS	N/A	N/A	04-12-2004
Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	17-01-2005
Horn Antenna	Rohde & Schwarz	HF906	100095	01-04-2005
Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	22-12-2004
0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	30-05-2004

### 4.2 E.U.T. Operation

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

Operating Environment:

Temperature: 24°C

Humidity: 56 % RH

Atmospheric Pressure: 1009 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:** FCC Part15 C Section 15.235

**Test Date:** 1 February 2005

**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 dBμV/m between 30MHz & 88MHz  
43.5 dBμV/m between 88MHz & 216MHz  
46.0 dBμV/m between 216MHz & 960MHz  
54.0 dBμV/m above 960MHz

**Detector:** Peak Scan (120kHz resolution bandwidth)



## SGS-CSTC Standards Technical Services Ltd.

Report No.: GLEMO050100258RFF(I)

Page: 6 of 11

Test Procedure: The procedure used was ANSI Standard C63.4-2000. The receive 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.

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Bilog antenna with 2 orthogonal polarities and peak emissions from the EUT were detected within 6dB of the class B limit line.

The following measurements were performed on the EUT on 1 February 2005:

Test the EUT in transmitting mode.

Intentional emission

Frequency (MHz)	Antenna Polarization	Peak Measurement			Average Measurement		
		Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
<b>49.860</b>	Vertical	<b>67.9</b>	100.0	<b>32.1</b>	<b>61.3</b>	80.0	<b>18.7</b>
<b>49.860</b>	Horizontal	<b>52.6</b>	100.0	<b>47.4</b>	<b>45.6</b>	80.0	<b>34.4</b>

Other emissions

Vertical

Frequency (MHz)	Transducer (dB)	Receiver QP Reading (dBμV)	Receiver QP Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna High(m)	Turntable Angle(°)
99.720	10.8	19.4	30.2	40.0	9.8	1.00	156
349.033	17.6	16.2	33.8	46.0	12.2	1.00	205
598.335	22.3	14.9	37.2	46.0	8.8	1.00	235
698.063	22.3	15.9	38.2	46.0	7.8	1.00	46
797.783	23.8	17.0	40.8	46.0	5.2	1.00	157
897.500	24.4	13.8	38.2	46.0	7.8	1.00	112

Horizontal:

Frequency (MHz)	Transducer (dB)	Receiver QP Reading (dBμV)	Receiver QP Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna High(m)	Turntable Angle(°)
299.168	19.4	8.9	28.3	46.0	17.7	2.31	265
698.063	23.3	15.3	38.6	46.0	7.4	2.74	206
747.918	23.1	12.8	35.9	46.0	10.1	2.65	157
797.783	22.8	15.5	38.3	46.0	7.7	3.45	352
847.645	23.4	13.4	36.8	46.0	9.2	3.56	156
897.500	24.1	18.7	42.8	46.0	3.2	3.36	241



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

Report No.: GLEMO050100258RFF(I)

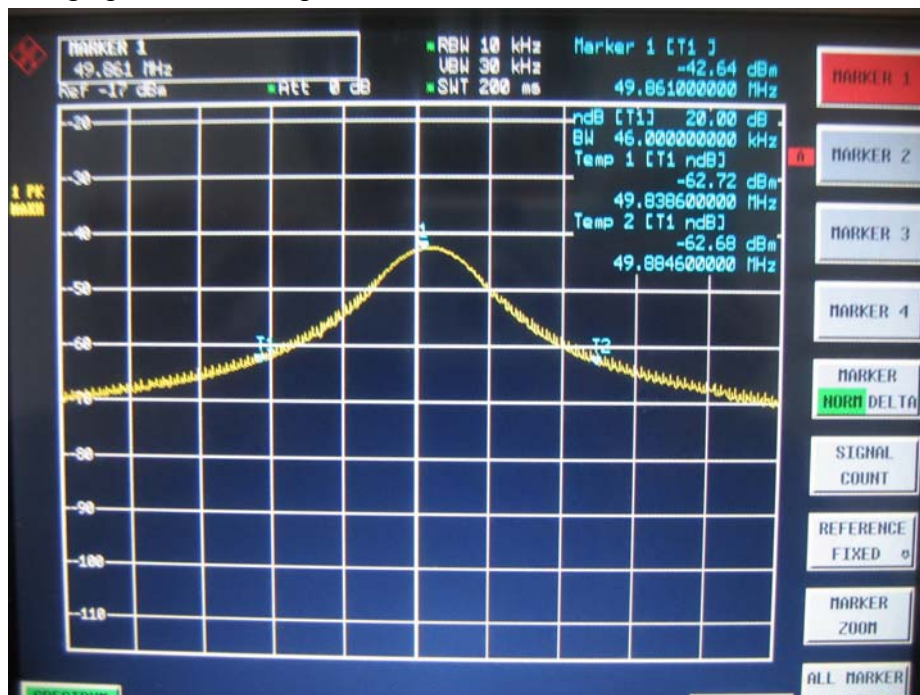
Page: 7 of 11

**Test Results: The unit does meet the FCC Part 15 C requirements. But the result is close to limit.**

#### 4.3.2 Occupied Bandwidth

Test	FCC Part 15 C
Requirement:	
Test Method:	FCC Part15 C Section 15.235: Operation within the band 49.82 – 49.90MHz
Test Date:	2 February 2005
Requirements:	The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges 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.



#### **4.3.3 Photographs - Radiated Emission Test Setup in Chamber**

