SGS-CSTC Standards Technical Services
(Shanghai) Co., Ltd.

588 West Jindu Road,Songjiang District,Shanghai,China
Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5678
ee.shanghai@sgs.com

1 Cover Page

FCC MPE REPORT

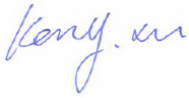
Application No.:	SHEM1311002384RF
Applicant:	Hansong (Nanjing) Technology Ltd.
Manufacturer:	Martin Logan
FCC ID:	XCO-CRESCENDO
IC:	7756A-CRESCENDO
Equipment Under Test (EUT): **NOTE:** The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Airplay speaker
Model No.(EUT):	Crescendo
Standards:	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance
Date of Receipt:	November 27, 2013
Date of Test:	December 02, 2013 to December 23, 2013
Date of Issue:	January 07, 2014
Test Result:	**Pass***

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

Tony Wu
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	December 31, 2013	/	Original

Authorized for issue by:				
Engineer		Eddy Zong **Print Name**		
Clerk		Susie Liu **Print Name**		
Reviewer		Keny Xu **Print Name**		

3 Contents

4 General Information

4.1 Client Information

Applicant:	Hansong (Nanjing) Technology Ltd.
Address of Applicant:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China.
Manufacturer:	Martin Logan
Address of Manufacturer:	2101 Delaware Street Lawrence KS 66046 USA
Factory:	Hansong (Nanjing) Technology Ltd.
Address of Factory:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China.

4.2 General Description of E.U.T.

Product Name:	Airplay speaker
Model No.(EUT):	Crescendo
Product Description:	Mobile Product

4.3 Details of E.U.T.

Operation Frequency:	BT: 2402MHz~2480MHz DTS: 2412MHz-2462MHz
Bluetooth Version:	3.0+EDR
Modulation Technique:	BT: (GFSK, π/4DQPSK, 8DPSK) DTS: 802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	BT: 79 DTS: 11
Antenna Type	BT: Integral DTS: Integral(the two PIFA antennas are not working simultaneously.)
Antenna Gain	2 dBi
Power Supply:	AC100-240V 50/60Hz
Cable Type:	About 180cm length (2 Wires)
Engineering mode:	Using test software to control EUT working in continuous transmitting, and select channel and modulation type

4.4 Test Location

All tests were performed at SGS E&E EMC lab

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

4.5 Test Facility

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

- **CNAS (No. CNAS L0599)**

  CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

  SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

  The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

5 Test Standards and Limits

According to§1.1310 Radiofrequency radiation exposure limits:

The limit for general population/uncontrolled exposures

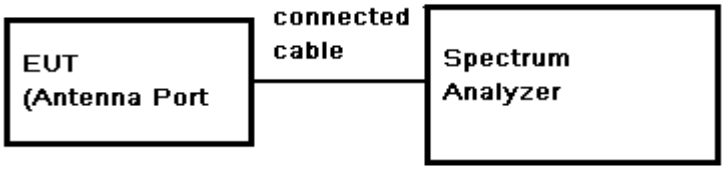
Frequency	Power density(mW/cm^2)	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

6 Measurement and Calculation

6.1 Maximum transmit power

EUT Operation: Test in fixing frequency operating mode at lowest, middle and highest frequency.

Test Configuration:



Test Data:

For BT:

Test mode	Channel	Reading Peak Power (dBm)	Cable Loss (dB)	Peak Power (dBm)	Peak Power (mW)	Peak Power Limit (dBm)	Result
GFSK	**Low**	**1.50**	**0.5**	**2.00**	**1.58**	30	PASS
	Mid	0.01	0.5	0.51	1.12	30	PASS
	High	-0.39	0.5	0.11	1.03	30	PASS
π/4DQPSK	Low	1.24	0.5	1.74	1.49	30	PASS
	Mid	0.55	0.5	1.05	1.27	30	PASS
	High	-1.12	0.5	-0.62	0.87	30	PASS
8DPSK	Low	1.26	0.5	1.76	1.50	30	PASS
	Mid	0.57	0.5	1.07	1.28	30	PASS
	High	-1.10	0.5	-0.60	0.87	30	PASS

For DTS:

Antenna A

Test mode	Channel	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
802.11b	Low	18.54	0.5	19.04	80.17	30	PASS
	Mid	18.77	0.5	19.27	84.53	30	PASS
	High	18.60	0.5	19.10	81.28	30	PASS
802.11g	**Low**	**19.94**	**0.5**	**20.44**	**110.66**	30	PASS
	Mid	19.90	0.5	20.40	109.65	30	PASS
	High	19.59	0.5	20.09	102.09	30	PASS

Antenna B

Test mode	Channel	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
802.11b	Low	17.82	0.5	18.32	67.92	30	PASS
	Mid	18.78	0.5	19.28	84.72	30	PASS
	High	18.81	0.5	19.31	85.31	30	PASS
802.11g	**Low**	**20.03**	**0.5**	**20.53**	**112.98**	30	PASS
	Mid	19.72	0.5	20.22	105.20	30	PASS
	High	19.61	0.5	20.11	102.57	30	PASS

6.2 MPE Calculation

According to the formula S=$\frac{PG}{4R^2\pi}$, we can calculate S which is MPE.

Note:

1) P (Watts) =Power Input to antenna =$10^{\frac{dBm}{10}}$ / 1000

2) G (Antenna gain in numeric) = 10^ (Antenna gain in dBi /10)

3) R = distance to the center of radiation of antenna (in meter) = 20cm

4) MPE limit = 1mW/cm²

For BT:

The Max Conducted Peak Output Power is 1.58mW in middle channel of GFSK;

The best case gain of the antenna is 2dBi. 2dB logarithmic terms convert to numeric result is nearly 1.58

So, S= $\frac{PG}{4R^2\pi}$ =$\frac{1.58\times1.58}{4\times400\times3.14}$ =0.0005 mW/cm^2 < 1mW/cm^2

For DTS:

The Max Conducted Peak Output Power is 112.98mW in lowest channel of 802.11g;

The best case gain of the antenna is 2dBi. 2dB logarithmic terms convert to numeric result is nearly 1.58

So, S= $\frac{PG}{4R^2\pi}$ =$\frac{112.98\times1.58}{4\times400\times3.14}$ =0.036 mW/cm^2 < 1mW/cm^2

The BT and the DTS modules cann't simultaneous transmitting at frequency 2.4GHz band, according to the KDB447498 D01 section 7.2 determine the device is exclusion from SAR test.

7 EUT Constructional Details

Refer to the < Crescendo _External Photos -FCC> & < Crescendo _Internal Photos-FCC>.

--End of the Report--