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1 Cover Page

RF MPE REPORT

Application No.:	SHEM1807005934CR
Applicant:	Hansong (Nanjing) Technology Ltd.
FCC ID:	XCO-MSH
IC:	7756A-MSH
Equipment Under Test (EUT):	
NOTE: The following sample(s) was/were submitted and identified by the client as	
Product Name:	wireless speaker
Model No.(EUT):	Music System Home
Standards:	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 5 (March 2015)
Date of Receipt:	2018-07-20
Date of Test:	2018-08-13 to 2018-09-07
Date of Issue:	2018-10-24
Test Result:	Pass*

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



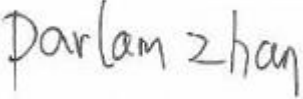
Parlam Zhan
 E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. 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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Revision Record			
Version	Description	Date	Remark
00	Original	2018-10-24	/

Authorized for issue by:			
			
		<hr/>	
		Bill Wu / Project Engineer	
			
		<hr/>	
		Parlam Zhan /Reviewer	



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3 General Information

3.1 Client Information

Applicant:	Hansong (Nanjing) Technology Ltd.
Address of Applicant:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China
Manufacturer:	Hansong (Nanjing) Technology Ltd.
Address of Manufacturer:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China
Factory:	Hansong (Nanjing) Technology Ltd.
Address of Factory:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China

3.1 General Description of E.U.T.

Power supply:	AC 100-240V 50/60Hz by adapter Adapter: Model FJ-SW20171504000D Input 100-240V 50/60Hz Output 15V 4000mA
Test voltage:	AC 120V/60Hz
Cable:	AC Cable 1.8m DC Cable 1.8m

3.2 Technical Specifications

BT

Antenna Gain	2dBi
Antenna Type	PIFA
Channel Spacing	1MHz
Modulation Type	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels	79
Operation Frequency	2402MHz to 2480MHz
Spectrum Spread Technology	Frequency Hopping Spread Spectrum(FHSS)

2.4G WiFi

Antenna Gain	3dBi
Antenna Type	PIFA Antenna
Channel Spacing	5MHz
Modulation Type	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels	802.11b/g/n(HT20):11
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz



3.3 Test Location

All tests were performed at:

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

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

3.4 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.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program(NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **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-1.

- **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-13868, C-14336, T-12221, G-10830 respectively.

4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, 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

4.2 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W

5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM180700593401 & 150501932SSHA-001.

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
BT	2402	0.99	1.26
	2441	1.00	1.26
	2480	0.99	1.26
	2402	1.07	1.28
	2441	1.08	1.28
	2480	1.08	1.28
	2402	1.11	1.29
	2441	1.12	1.29
	2480	1.12	1.29

2.4G WiFi

Mode	Frequency (MHz)	Reading (dBm)		Total Power (mw)	Total Power (dBm)	Limit (dBm)	Margin (dB)
		Port0	Port 1				
802.11b	2412	21.29	20.15	238.10	23.77	30.00	6.23
	2437	20.66	20.01	216.64	23.36	30.00	6.64
	2462	20.01	19.96	199.31	23.00	30.00	7.00
802.11g	2412	24.43	24.94	589.22	27.70	30.00	2.30
	2437	24.25	24.49	547.26	27.38	30.00	2.62
	2462	23.95	24.53	532.11	27.26	30.00	2.74
802.11n20	2412	24.19	24.28	530.34	27.25	30.00	2.75
	2437	23.59	24.24	494.02	26.94	30.00	3.06
	2462	23.32	24.07	470.05	26.72	30.00	3.28



5.2 MPE Calculation

For FCC:

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 1.29mW

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

$$S = \frac{PG}{4R^2\pi} = \frac{1.29 \times 1.58}{4 \times 400 \times 3.14} = 0.0004 \text{ mW/cm}^2$$

For 2.4G WiFi

The Max Conducted Peak Output Power is 589.22mW

The two antennas completely correlated with each other, so the best case gain of the two antenna in MIMO mode is 6dBi for 2.4GHz, 6 dB logarithmic terms convert to numeric result is nearly 3.98

$$S = \frac{PG}{4R^2\pi} = \frac{589.22 \times 3.98}{4 \times 400 \times 3.14} = 0.467 \text{ mW/cm}^2$$

The BT and the DTS modules can simultaneous transmitting at frequency 2.4GHz band. But the

maximum rate of MPE is $\frac{0.0004}{1.0} + \frac{0.467}{1.0} = 0.4674 < 1.0$. according to the KDB447498 section 7.2

determine the device is exclusion from SAR test.

For IC:

$$E.I.R.P. = P * G = 0.58922 \times 3.98 = 2.35 \text{ W} < 2.68 \text{ W}$$

So the device is exclusion from SAR test.

--End of the Report--