



## SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

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# RF Exposure Evaluation Report

**Application No.:** SZEM1709009748CR  
**Applicant:** Harman International Industries, Inc  
**Address of Applicant:** 8500 Balboa Boulevard, Northridge, California 91329, UNITED STATES  
**Manufacturer:** Harman International Industries, Inc  
**Address of Manufacturer:** 8500 Balboa Boulevard, Northridge, California 91329, UNITED STATES  
**Factory:** TCL TECHNOLOGY ELECTRONICS (HUIZHOU) CO., LTD  
**Address of Factory:** Section 19, Zhongkai High-tech development Zone, Huizhou City, Guangdong Province, China  
Section 37, Zhongkai High-tech development Zone, Huizhou City, Guangdong Province, China

### Equipment Under Test (EUT):

**Product Name:** SUBWOOFER  
**Model No.:** VW6  
**Trade mark:** harman/kardon  
**FCC ID:** APIHKVW6  
**Standards:** 47 CFR Part 1.1307 (2016)  
47 CFR Part 1.1310 (2016)  
**Date of Receipt:** 2017-09-13  
**Date of Test:** 2017-09-13 to 2017-09-29  
**Date of Issue:** 2017-10-10

<b>Test Result :</b>	<b>PASS*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.



Jack Zhang  
EMC Laboratory 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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## 2 Version

<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
01		2017-10-10		Original

<b>Authorized for issue by:</b>				
				
		<hr/>		
		<b>Benson Wang /Project Engineer</b>		
				
		<hr/>		
		<b>Eric Fu /Reviewer</b>		



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## 4 General Information

### 4.1 General Description of EUT

Operation Frequency:	5743MHz~5840MHz
Hardware Version:	D
Software Version:	V18
Modulation Type:	GFSK
Number of Channel:	35
Sample Type:	mobile production
Antenna Gain:	ANT A: 2.85dBi
	ANT B: 2.85dBi
	(The two antenna cannot simultaneous transmission)
Antenna Type:	Integrated PCB antenna
Power Supply	AC 120V/60Hz



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### 4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China  
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

### 4.3 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab 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.

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



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**4.4 Deviation from Standards**

None.

**4.5 Abnormalities from Standard Conditions**

None.

**4.6 Other Information Requested by the Customer**

None.



## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

**TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

#### 5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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**4.1.3 EUT RF Exposure Evaluation**

Antenna Gain: 2.85dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.93 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
Middle	5791	9.84	9.64	0.004	1.0	PASS

Note: Refer to report No. SZEM170900974801 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.