

Report No.: SZEM200900949103

Page: 1 of 8

## RF Exposure Evaluation Report

Application No.: SZEM2009009491CR

**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: Please refer to section 4.1

Address of Factory: Please refer to section 4.1

**Equipment Under Test (EUT):** 

Product Name: Sactionals StealthTech Sound + Charge Center Channel

Model No.: EE4034

FCC ID: APILOVESAC

Standards: 47 CFR Part 1.1307

47 CFR Part 1.1310 47 CFR Part 2.1091

**Date of Receipt:** 2020-09-21

**Date of Test:** 2020-11-16 to 2021-01-29

**Date of Issue:** 2021-02-01

Test Result : PASS\*

Keny Xu EMC Laboratory Manager

Ceny. xu



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printer overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions, aspx.and, for electronic format documents subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions-And-Conditions-And-Condition

No.1 Workshop, M-10, Mode Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 t (86-755) 26710594 www.sp.sgroup.com.
中国 · 菜圳 · 科技园中区M-10核一号厂房 邮票: 518057 t (86-755) 26012053 t (86-755) 26710594 sgs.chima@sgs.com

<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



Report No.: SZEM200900949103

Page: 2 of 8

### 2 Version

	Revision Record						
Version	Chapter	Date	Modifier	Remark			
01		2021-02-01		Original			

Authorized for issue by:		
	Benson Wang	
	Benson Wang/Project Engineer	
	EvicFu	
	Eric Fu/Reviewer	



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.and, for electronic format documents, asptict to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions.aspx.adtonition is drawn to the limitation of liability, indemnification and jurisdiction issue defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's osle responsibility is to its Client and this document does not excensive parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) bested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing rinspection report & certificate, please contact us at telephone: (85-755) 8397 1443, or email: CN, Doccheck-Rags.com

or email: <u>CN.Doccheck@sgs\_com</u> Mb.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn 中国 · 菜如 · 科技国中区M-10核—号厂房 邮箱: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com



Report No.: SZEM200900949103

Page: 3 of 8

### 3 Contents

	Page
COVER PAGE	1
VERSION	2
CONTENTS	3
GENERAL INFORMATION	4
4.1 GENERAL DESCRIPTION OF EUT	4
4.2 TEST LOCATION	6
4.3 Test Facility	6
4.4 DEVIATION FROM STANDARDS	6
4.5 ABNORMALITIES FROM STANDARD CONDITIONS	6
4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER	6
RF EXPOSURE EVALUATION	7
5.1 RF Exposure Compliance Requirement	7
5.1.1 Limits	7
5.1.2 Test Procedure	
4.1.3 EUT RF Exposure Evaluation	
	VERSION  CONTENTS



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.and, for electronic format documents, asptict to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions.aspx.adtonition is drawn to the limitation of liability, indemnification and jurisdiction issue defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's osle responsibility is to its Client and this document does not excensive parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) bested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing rinspection report & certificate, please contact us at telephone: (85-755) 8397 1443, or email: CN, Doccheck-Rags.com



Report No.: SZEM200900949103

Page: 4 of 8

### 4 General Information

### 4.1 General Description of EUT

Power Supply:	AC 100-240V 50/60Hz;
For BT:	
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum (FHSS)
Antenna Type:	PIFA Antenna
Antenna Gain:	3dBi
For BLE:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Data Rate:	Only support 1M/bit
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	3dBi



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/en/Terms-and-Conditions.aspx.and">http://www.sgs.com/en/Terms-and-Conditions.aspx.and</a>, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/en/Terms-en-Document.aspx">http://www.sgs.com/en/Terms-en-Document.aspx</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgety or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) bested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing rinspection report & certificate, please contact us at telephone: (85-755) 8307 1443, or email: CN.Doccheck-Rags.com</a>.

No.1 Workshop, M-10, Midde Section, Science & Technology Park, Shenzhen, Chrins 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn 中国·梁圳·科技国中区M-10核一号厂房 邮箱: 518057 t (86-755) 26012053 f (88-755) 26710594 sgs.chima@sgs.com



Report No.: SZEM200900949103

Page: 5 of 8

#### For SWM908SD module:

Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels		
	Band I	802.11a	5180-5240	4		
	Band II-A	802.11a	5260-5320	4		
	Band II-C	802.11a	5500-5700	11		
	Band III	802.11a	5745-5825	5		
Modulation Type:	802.11a: OFDM	(64QAM, 16QAM, QPSK, BPSK)				
Channel Spacing:	802.11a: 20MHz	802.11a: 20MHz				
DFS Function:	Master with Rada	Master with Radar detection				
Antenna Type:	Integral Antenna					
Antenna Gain:	1dBi					

Factory: 1. Shenzhen 3Nod Digital Technology Co., Ltd

Guangxi 3Nod Digital Technology Co., Ltd.
 THREE LINK TECHNOLOGY CO., LTD

4. Pingxiang 3Nod Digital Technology CO., LTD.

Address of Factory:

1. 401, ZONE 101A, WORKSHOP 15, ZHONGFU ROAD, TANGXIAYONG COMMUNITY, YANLUOSTREET, BAOAN DISTRICT, SHENZHEN CITY, GUANGDONG PROVINCE, P.R.C.

2. The B02 Plant Building of 3nod Smart Industrial Part in Beihai Industrial Park, East of Jilin Road, North of Longtoujiang Reservoir, Guangxi, P. R. China

3. Lot CN09-1, Yen Phong Industrial Zone (Expand zone), Yen Trung commune, Yen Phong District, Bac Ninh province, Viet Nam.

4. Building A2 of Hongmu Yuanmu Trading Center Phase 1, Pingxiang Wantong Logistics Park, Nanshan Economic Development Zone, Chongzuo City, Guangxi Zhuang Autonomous Region, P.R.C



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printer overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format documents subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document\_aspx Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any helder of this document advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduce except in full, without prior writen approval of the Company, Any unauthorized alteration, forgery or faisification of the content of appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: a check the authernicity of testing /impaction report & certificate, please contact us at timephone: (85-75) 3397 1443



Report No.: SZEM200900949103

Page: 6 of 8

#### 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:

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.

VCC

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 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.

#### Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

#### 4.4 Deviation from Standards

None.

#### 4.5 Abnormalities from Standard Conditions

None.

### 4.6 Other Information Requested by the Customer

None.



Inless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed workered, available on request or accessible at http://www.acs.com/en/Terms-and-Conditions.acsx/and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.acs.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any helder of this document is edvised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of district instructions, if any. The Company's sole responsibility is to its Client and this document does not excended parties to a ransaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, foregry or faisification of the content except in this test report of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the easilits shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

\*\*Attention\*\*. To check the authenticity of testing image tion reports a certificate, please contact us at telephone: (85-755) 8397 1443,

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sg.sgroup.com.
中国 • 菜圳 • 科技国中区M-10核—号厂房 邮第: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.chima@sgs.com



Report No.: SZEM200900949103

Page: 7 of 8

### 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/cm²)	Averaging time (minutes)
(A) Lim	its for Occupational	/Controlled Exposu	res	
0.3–3.0 3.0–30 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6
(B) Limits	for General Populati	on/Uncontrolled Exp	oosure	
0.3–1.34	614 824/f 27.5	1.63 2.19/f 0.073	*(100) *(180/f²) 0.2 f/1500 1.0	30 30 30 30 30

F= Frequency in MHz

Friis Formula

Friis transmission formula: Pd = (Pout\*G)/(4\* Pi \* R 2)

Where

Pd = power density in mW/cm2

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 id the limit of MPE, 1 mW/cm2. 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.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printer overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format documents subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document\_aspx Attention is drawn to the limitation of liability, indemnification in an intermediate the second of the decomment advised that information contained hereon reflects the Company's lindings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduce except in full, without prior writen approval of the Company, Any unauthorized alteration, forgery or faisification of the content of appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: 1 cliect the authenticity of testing imagestion report & certificate, places contact us at telephone: (85-75) 8397 1443

No.1 Workshop, M-10, Midde Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012033 f (86-755) 26710594 www.sg.sgroup.com.c 中国。東圳・科技国中区M-10核一号厂房 邮箱: 518057 t (86-755) 26012033 f (86-755) 26710594 sgs.chima@sgs.com



Report No.: SZEM200900949103

Page: 8 of 8

#### 4.1.3 EUT RF Exposure Evaluation

For BT/BLE:

Antenna Gain: 3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.00 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Max Conducted Output Power (including tune-up tolerance) (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	MPE Ratios	Result
6.48	4.45	0.0018	1.0	0.0018	PASS

SWM908SD module:

Antenna: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.26 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Max Conducted Output Power	Output Power	Power Density	Limit	MPE	Result
(including tune-up tolerance)	to Antenna	at R = 20 cm		Ratios	
(dBm)		_			
(dBiii)	(mW)	(mW/cm²)			

#### exposure conditions for simultaneous transmission operations

The EUT has two modules: Bluetooth module and SWM908SD module, they can simultaneous transmission at the same time.

So, Simultaneous transmission SAR test is not required, because the Max. sum of the MPE ratios is 0.0018+0.0063=0.0081<1.

- End of the Report -



Inless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed workerful, available on request or accessible at http://www.acs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.acs.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is edvised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of citient's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a ransaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, foregry or falsification of the content expertance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the eauths shown in this test report refer only to the sample(s) tested and such assign(s) are retained for 30 days only.

\*\*Attention\*\*. To shock the authenticity of testing image tion reports a certificate, please contact us at telephone: (85-755) \$397 1443,

No.1 Workshop, M-10, Midde Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012033 f (86-755) 26710594 www.sg.sgroup.com.c 中国。東圳・科技国中区M-10核一号厂房 邮箱: 518057 t (86-755) 26012033 f (86-755) 26710594 sgs.chima@sgs.com