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District, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Report No.: SZEM150600379604

Fax: +86 (0) 755 2671 0594 Page: 1 of 8

## **RF Exposure Evaluation Report**

Application No.: SZEM1506003796CR

Applicant: Polk Audio
Manufacturer: Polk Audio

Factory Zhao Yang Electronic (ShenZhen) Co., Ltd.

**Product Name:** wireless all-in-one speaker system

Model No.(EUT): OMNI S6
Trade Mark: POLK

FCC ID: WLQOMNIS6

**Standards:** 47 CFR Part 1.1307 (2014)

47 CFR Part 1.1310 (2014)

**Date of Receipt:** 2015-07-31

**Date of Test:** 2015-08-03 to 2015-08-12

**Date of Issue:** 2015-08-13

Test Result : PASS\*

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

#### Authorized Signature:



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.

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.

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### 2 Version

Revision Record									
Version	Version Chapter Date Modifier Remark								
00		2015-08-13		Original					

Authorized for issue by:		
	Owen Zhon	2015-08-12
Tested By	(Owen Zhou) /Project Engineer	Date
	Hedy Wen.	2015-08-13
Prepared By	(Hedy Wen) /Clerk	Date
	Eric Fu	2015-08-13
Checked By	(Eric Fu) /Reviewer	Date

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### 4 General Information

#### 4.1 Client Information

Applicant:	Polk Audio		
Address of Applicant:	5601 Metro Drive Baltimore, Maryland, 21215, USA		
Manufacturer:	Polk Audio		
Address of Manufacturer:	5601 Metro Drive Baltimore, Maryland, 21215, USA		
Factory:	Zhao Yang Electronic (ShenZhen) Co., Ltd.		
Address of Factory:	Section A, 4th Floor, Building 1 & Building 2, De Yong Jia Industrial Park, Guang Qiao Road, Yu Lv Community, Gong Ming Street, Guang Ming New District, Shenzhen, Guangdong, P.R.C		

## 4.2 General Description of EUT

Product Name:	wireless all-in-one speaker system				
Model No.:	OMNI S6				
Trade Mark:	POLK				
Sample Type:	Fixed prod	luction			
Antenna Type:	Integral				
AUX Cable:	150cm				
Power Supply:	AC 100-24	0V 50/60Hz			
For 2.4 GHz					
Operation Frequency:	IEEE 802.	11b/g/n(HT20): 2412MHz to	2462MHz		
	IEEE 802.	11n(HT40): 2422MHz to 24	52MHz		
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n(HT20): 11 Channels				
	IEEE 802.11n(HT40): 7 Channels				
Channel Separation:	5MHz				
Type of Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)				
	IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)				
	IEEE 802.11n(HT20 and HT40): OFDM (64QAM, 16QAM, QPSK, BPSK)				
Test Power Grade:	802.11b :1	5dBm@11Mbps;			
	802.11g:10	0 dBm@54Mbps;			
	802.11n20	(2.4G):10 dBm@MCS7;			
	802.11n40(2.4G) :10 dBm@MCS7; (manufacturer declare)				
Test Software of EUT:	teraterm.exe (manufacturer declare )				
Antenna Gain:	2.28dBi				
For 5GHz					
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number channels	of
	UNII IEEE 802.11a 5180-5240 4				

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		T		
Band I	IEEE 802.11n 20MHz	5180-5240	4	
	IEEE 802.11n 40MHz	5190-5230	2	
UNII Band II-	IEEE 802.11a	5260-5320	4	
	IEEE 802.11n 20MHz	5260-5320	4	
	IEEE 802.11n 40MHz	5270-5310	2	
UNII	IEEE 802.11a	5500-5700	11	
	IEEE 802.11n 20MHz	5500-5700	11	
	IEEE 802.11n 40MHz	5510-5670	5	
UNII	IEEE 802.11a	5745-5825	5	
Band III	IEEE 802.11n 20MHz	5745-5825	5	
	IEEE 802.11n 40MHz	5755-5795	2	
IEEE 802.	11a: OFDM(BPSK/QPSK/1	6QAM/64QAM)		
IEEE 802.	EEE 802.11n: OFDM(BPSK/QPSK/16QAM/64QAM)			
802.11a :1	3 dBm@54Mbps;			
802.11n20	(5G) :11 dBm@MCS7;			
802.11n40	(5G) :11 dBm@MCS7; (m	anufacturer declare)		
teraterm.exe (manufacturer declare )				
3.92dBi				
	UNII Band II- A  UNII Band II- C  UNII Band III  IEEE 802. IEEE 802. 802.11a:1 802.11n20 802.11n40 teraterm.e	IEEE 802.11n 40MHz	IEEE 802.11n 40MHz   5190-5230	

### 4.3 Test Location

All tests were performed at:

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

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.



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### 4.4 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.

#### VCCI

The 10m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) 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 – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 No.: 556682.

#### Industry Canada (IC)

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

### 4.5 Deviation from Standards

None.

#### 4.6 Abnormalities from Standard Conditions

None.

## 4.7 Other Information Requested by the Customer

None.



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## 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	(A) Limits for Occupational/Controlled Exposures								
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	(B) Limits for General Population/Uncontrolled Exposure								
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.

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### 4.1.3 EUT RF Exposure Evaluation

#### For 2.4GHz WIFI

Antenna Gain: 2.28dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.69 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

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
2412	18.84	76.56	0.026	1.0	PASS

Note: Refer to report No. SZEM150600379602 for EUT test Max Conducted Peak Output Power value.

#### For 5GHz WIFI

Antenna Gain: 3.92dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.47 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Frequency	Max Conducted	Output Power	Power Density	Limit	Result
(MHz)	Peak Output	to Antenna	at R = 20 cm		
	Power (dBm)	(mW)	(mW/cm <sup>2</sup> )		
5785	13.84	24.21	0.012	1.0	PASS

Note: Refer to report No. SZEM150600379603 for EUT test Max Conducted Peak Output Power value. The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.



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