RF EXPOSURE REPORT

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Report No.: 15070695-FCC-H

Applicant	SHENZHEN TONGKE ELECTRONICS CO., LTD
Product Name	Bluetooth Speaker
Model No.	F8
Serial No.	Schultz Crystal
Test Standard	FCC 2.1091.2014
Test Date	August 27 to September 19, 2015
Issue Date	October 10, 2015
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Winnie.Zhang	David Huang	
Winnie Zhang Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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CONTENTS

1. Report Revision History

Report No.	Report Version	Description	Issue Date
15070695-FCC-H	NONE	Original	September 25, 2015
15070695-FCC-E	V1	Add model information	October 10, 2015

2. Customer information

Applicant Name	SHENZHEN TONGKE ELECTRONICS CO., LTD
Applicant Add	The Second Industrial Zone, Phoenix Village, Fuyong Town,Shenzhen,China
Manufacturer	SHENZHEN TONGKE ELECTRONICS CO., LTD
Manufacturer Add	The Second Industrial Zone, Phoenix Village, Fuyong Town,Shenzhen,China

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Labview of SIEMIC version 2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Bluetooth Speaker
Main Model:	F8
Serial Model:	Schultz Crystal
Equipment Category：	DSS
Antenna Gain:	Bluetooth& BLE: 0dBi
Input Power:	Battery: Spec: 7.4V 2200mAh DC: 5V
Trade Name :	SIGN, SCHULTZ
FCC ID:	2ABM9F8
Type of Modulation:	Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK
RF Operating Frequency (ies):	Bluetooth& BLE: 2402-2480 MHz
Number of Channels:	Bluetooth: 79CH BLE: 40CH

5. FCC §2.1091 - Maximum Permissible exposure (MPE)

6.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission' s guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	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

* = Plane-wave equivalent power density

6.2 Test Result

Bluetooth Mode:

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	GFSK	Low	2402	2.380	2±1
		Mid	2441	**5.130**	5±1
		High	2480	4.277	4±1
	π /4 DQPSK	Low	2402	0.012	0±1
		Mid	2441	3.376	3±1
		High	2480	2.278	2±1
	8-DPSK	Low	2402	0.395	1±1
		Mid	2441	3.717	3±1
		High	2480	2.503	2±1

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm^2)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 6(dBm)

Maximum output power at antenna input terminal: 3.981(mW)

Prediction distance: >20 (cm)

Predication frequency: 2441 (MHz) High frequency

Antenna Gain (typical): 0 (dBi)

The worst case is power density at predication frequency at 20 cm: 0.0008(mW/cm^2)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

0.0008 (mW/cm²) < 1.0 (mW/cm²)

BLE:

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	GFSK	Low	2402	3.168	4±1
		Mid	2441	**4.628**	4±1
		High	2480	3.976	4±1

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 4.628(dBm)

Maximum output power at antenna input terminal: 2.903(mW)

Prediction distance: >20 (cm)

Predication frequency: 2441 (MHz) High frequency

Antenna Gain (typical): 0 (dBi)

The worst case is power density at predication frequency at 20 cm: 0.0006(mW/cm²)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

0.0006 (mW/cm²) < 1.0 (mW/cm²)

Result: Pass