

RF EXPOSURE REPORT

FOR

Applicant	:	Harman International Industries, Incorporated
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment	:	In Vehicle Bluetooth Speaker
Model No	:	JBL SMARTBASEWL
Trade Mark	:	JBL
FCC ID	:	API-JBLSBWL
IC	:	6132A-JBLSBWL
Manufacturer	:	Harman International Industries, Incorporated
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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REPORT

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TEST REPORT DECLARE

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Standard Used: KDB447498 D01 General RF Exposure Guidance v05, RSS-102 Issue 5, March 2015

We Declare:

The equipment described above is assessed by Dongguan Dongdian Testing Service Co., Ltd and in the configuration assessed the equipment complied with the standards specified above. The assessed results are contained in this report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these assess.

After evaluation, our opinion is that the equipment In Accordance with above standard.

Report No:	DDT-R16Q0726-9E11		
Date of Assess:	Aug. 11, 2016-Aug. 29, 2016	Date of Report:	Aug. 30, 2016



Prepared By:

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Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

1. General information

1.1. Description of Equipment

EUT* Name	: In Vehicle Bluetooth Speaker
Model Number	: JBL SMARTBASEWL
EUT function description	: Please reference user manual of this device
Power supply	: DC 12V
Radio Specification	: Bluetooth V4.1 (BDR/EDR/BLE)
Operation frequency	: 2402MHz -2480MHz
Modulation	: GFSK, $\pi/4$ QPSK, 8-DPSK
Data rate	: 1Mbps, 2Mbps, 3Mbps
Antenna Type	: Integrated antenna, maximum PK gain: 2.72dBi
Date of Receipt	: Aug. 11, 2016
Sample Type	: Series production

1.2. Assess laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-22891499 <http://www.dgddt.com>

2. RF Exposure evaluation for FCC

2.1. Requirement

Systems operating under the provisions of FCC 47 CFR 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.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

Limits for General Population/Uncontrolled Exposure

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2. 2. Calculation Method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)=

d = Separation distance between radiator and human body (m)

The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance, $d=0.2\text{m}$, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. 3. Estimation Result

Mode	Frequency (MHz)	PK Output power (dBm)	Output power (mW)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE Values (mW/cm ²)	MPE Limit (mW/cm ²)
GFSK	2402	5.060	/	2.72	1.87	/	1
	2441	5.830	/	2.72	1.87	/	1
	2480	5.680	/	2.72	1.87	/	1
$\pi/4$ QPSK	2402	4.002	/	2.72	1.87	/	1
	2441	4.201	/	2.72	1.87	/	1
	2480	4.121	/	2.72	1.87	/	1
8-DPSK	2402	3.370	/	2.72	1.87	/	1
	2441	4.200	/	2.72	1.87	/	1
	2480	4.020	/	2.72	1.87	/	1
BLE	2402	4.540	/	2.72	1.87	/	1
	2440	5.340	/	2.72	1.87	/	1
	2480	5.250	/	2.72	1.87	/	1
Max power	2441	6.830	4.82	2.72	1.87	0.0018	1

Note: The PK Output power including tune-up tolerance

Note: The estimation distance is 20cm

Manufacturing tolerance is $\pm 1\text{dB}$

Conclusion: No SAR evaluation required since transmitter power is below FCC threshold

3. RF Exposure evaluation for IC

3.1. Requirement

According to RSS-102 Issue 5 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:

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;

The EUT complies with RF specifications when the device used at 20cm form your body.

Bluetooth maximum peak output power=5.830dBm@2441MHz, Antenna gain: 2.72dBi, Manufacturing tolerance is ± 1 dB

$$\text{e.i.r.p. [mW]} = 10^{\frac{\text{Power [dBm]} + \text{Antenna gain [dBi]}}{10}} = 9.02 \text{mW} < 1.31 \times 10^{-2} f^{0.6834} \text{ W} (2.71 \text{W})$$

Then SAR evaluation is not required

END OF REPORT