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RF Exposure Evaluation Report

Report No.: CQASZ20210400522E-02
Applicant: Dongguan Hele Electronics Co.,Ltd
Address of Applicant: Dalingya Industrial Zone, Daojiao Town, Dongguan City, Guangdong, China
Equipment Under Test (EUT):
EUT Name: Bluetooth Earphones
Model No.: In2031A
Brand Name: N/A
FCC ID: RDR-IN2031AR
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2021-4-23
Date of Test: 2021-4-23 to 2021-5-12
Date of Issue: 2021-5-12
Test Result: **PASS***

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

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Jun Li

(Jun Li)

Approved By:

Sheek Luo

(Sheek Luo)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210400522E-02	Rev.01	Initial report	2021-5-12

2 Contents

	Page
1 VERSION.....	2
2 CONTENTS.....	3
.....	3
3 GENERAL INFORMATION.....	4
3.1 CLIENT INFORMATION.....	4
3.2 GENERAL DESCRIPTION OF EUT.....	4
3.3 GENERAL DESCRIPTION OF BT.....	4
4 SAR EVALUATION.....	5
4.1 RF EXPOSURE COMPLIANCE REQUIREMENT.....	5
4.1.1 <i>Standard Requirement</i>	5
4.1.2 <i>Limits</i>	5
4.1.3 <i>EUT RF Exposure</i>	6

3 General Information

3.1 Client Information

Applicant:	Dongguan Hele Electronics Co.,Ltd
Address of Applicant:	Dalingya Industrial Zone,Daojiao Town,Dongguan City,Guangdong,China
Manufacturer:	Dongguan Hele Electronics Co.,Ltd
Address of Manufacturer:	Dalingya Industrial Zone,Daojiao Town,Dongguan City,Guangdong,China
Factory:	Dongguan Hele Electronics Co.,Ltd
Address of Factory:	Dalingya Industrial Zone,Daojiao Town,Dongguan City,Guangdong,China

3.2 General Description of EUT

Product Name:	Bluetooth Earphones	
Model No.:	In2031A	
Trade Mark:	N/A	
EUT Supports Radios application:	Bluetooth dual mode: 2402-2480MHz	
Hardware Version:	V 5.1	
Software Version:	V 5.1	
EUT Power Supply:	Right ear:	lithium battery: DC 3.7V, 50mAh, Charge by DC 5.0V
	Changing Box	Input DC 5V 600mA Output DC 5V 150mA lithium battery: DC 3.7V, 600mAh, Charge by DC 5.0V

3.3 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V 5.1
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☐ Mobile ☒ Portable ☐ Fix Location
Antenna Type:	FPC Antenna
Antenna Gain:	0.1dBi

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]}{\leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}}$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.1.3 EUT RF Exposure

1) For BT

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	1.510	1±1	2	1.585
Middle(2441MHz)	2.220	2±1	3	1.995
Highest(2480MHz)	2.290	2±1	3	1.995
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-0.310	0±1	1	1.259
Middle(2441MHz)	0.730	0±1	1	1.259
Highest(2480MHz)	0.830	0±1	1	1.259
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-0.030	0±1	1	1.259
Middle(2441MHz)	0.910	0±1	1	1.259
Highest(2480MHz)	1.040	1±1	2	1.585

Worst case: GFSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	1.510	1±1	2	1.585	0.491	3.0
Middle (2441MHz)	2.220	2±1	3	1.995	0.623	
Highest (2480MHz)	2.290	2±1	3	1.995	0.628	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20210400522E-01