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RF Exposure Evaluation Report

Report No.:	CQASZ2020090990E-03
Applicant:	SPRITE Group Limited
Address of Applicant:	4th Floor, A3 Building, Shenliang Group, No.299 Guanping Road, Guanlan Street, Longhua District, Shenzhen, China
Equipment Under Test (EUT):	
EUT Name:	TWS Bluetooth headset
Model No.:	Klipsch T2 True Wireless, T50/T51, T52
Test Model No.:	Klipsch T2 True Wireless
Brand Name:	Klipsch
FCC ID:	2ADTFT52
Standards:	47 CFR Part 1.1307 47 CFR Part 2.1093 KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2020-09-04
Date of Test:	2020-09-04 to 2020-09-17
Date of Issue:	2020-09-17
Test Result:	**PASS***

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

Tested By: Martin Lee
(Martin Lee)

Reviewed By: Sheek . Luo
(Sheek Luo)

Approved By:
(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200900990E-03	Rev.01	Initial report	2020-09-17

2 Contents

3 General Information

3.1 Client Information

Applicant:	SPRITE Group Limited
Address of Applicant:	4th Floor, A3 Building, Shenliang Group, No.299 Guanping Road, Guanlan Street, Longhua District, Shenzhen, China
Manufacturer:	Shenzhen zhikang technology co., LTD
Address of Manufacturer:	4th Floor, A3 Building, Shenliang Group, No.299 Guanping Road, Guanlan Street, Longhua District, Shenzhen, China
Factory:	Shenzhen zhikang technology co., LTD
Address of Factory:	4th Floor, A3 Building, Shenliang Group, No.299 Guanping Road, Guanlan Street, Longhua District, Shenzhen, China

3.2 General Description of EUT

Product Name:	TWS Bluetooth headset	
Model No.:	Klipsch T2 True Wireless, T50, T51, T52	
Test Model No.:	Klipsch T2 True Wireless	
Trade Mark:	Klipsch	
EUT Supports Radios application:	Bluetooth dual mode: 2402-2480MHz	
Hardware Version:	T31RC-V1.0	
Software Version:	V1.3.2.0	
EUT Power Supply:	Left ear:	lithium battery: DC 3.7V, 50mAh, Charge by DC 5.0V
	Right ear:	lithium battery: DC 3.7V, 50mAh, Charge by DC 5.0V
	The earphone box:	lithium battery: DC 3.7V, 400mAh, Charge by DC 5.0V

3.3 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☐ Mobile ☒ Portable ☐ Fix Location
Test Software of EUT:	Bluetooth RF Test Tool (manufacturer declare)
Antenna Type:	Chip antenna
Antenna Gain:	1.15 dBi

3.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Type:	GFSK

Transfer Rate:	1Mbps, 2Mbps
Number of Channel:	40
Sample Type:	☐ Mobile ☒ Portable ☐ Fix Location
Test Software of EUT:	Bluetooth RF Test Tool (manufacturer declare)
Antenna Type:	Chip antenna
Antenna Gain:	1.15 dBi

Note:

1. Model No.: Klipsch T2 True Wireless, T50, T51, T52

Only the model Klipsch T2 True Wireless was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

2. Since the RF parameters of the left and right earplugs are the same, only the right ear was tested in this report.

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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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

f(GHz) is the RF channel transmit frequency in GHz
Power and distance are rounded to the nearest mW and mm before calculation[17]
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)	2.700	2.0±1	3.0	1.995
Middle(2441MHz)	3.730	3.0±1	4.0	2.512
Highest(2480MHz)	4.100	3.5±1	4.5	2.818
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	5.250	4.5±1	5.5	3.548
Middle(2441MHz)	6.260	5.5±1	6.5	4.467
Highest(2480MHz)	6.590	6.0±1	7.0	5.012
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	5.620	5.0±1	6.0	3.981
Middle(2441MHz)	6.750	6.0±1	7.0	5.012
Highest(2480MHz)	7.090	6.5±1	7.5	5.623

Worst case: 8DPSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	5.620	5.0±1	6.0	3.981	1.234	3.0
Middle (2441MHz)	6.750	6.0±1	7.0	5.012	1.566	
Highest (2480MHz)	7.090	6.5±1	7.5	5.623	1.771	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20200900990E-01

2) For BLE

Measurement Data

GFSK mode(1Mbps)				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	2.54	2.0±1	3.0	1.995
Middle(2440MHz)	3.71	3.0±1	4.0	2.512
Highest(2480MHz)	4.01	3.5±1	4.5	2.818
GFSK mode(2Mbps)				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	2.74	2.0±1	3.0	1.995
Middle(2440MHz)	3.91	-3.0±1	4.0	2.512
Highest(2480MHz)	4.19	3.5±1	4.5	2.818

Worst case: GFSK mode(2Mbps)						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	2.74	2.0±1	3.0	1.995	0.618	3.0
Middle (2440MHz)	3.91	-3.0±1	4.0	2.512	0.785	
Highest (2480MHz)	4.19	3.5±1	4.5	2.818	0.888	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20200900990E-02
BDR and BLE can not simultaneous transmitting at same time.