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RF Exposure Evaluation Report

Report No. :	CQASZ20190600507E-02
Applicant:	Kool Brands, LLC.
Address of Applicant:	P.O. box 41270 Reno, NV 89504
Equipment Under Test (EUT):	
Product:	Megadrive Bluetooth Receiver
All Model No.:	RET00128, RB-SGA-010
Test Model No.:	RET00128
Brand Name:	Retro-Bit
FCC ID:	2ARPV-R6106D
Standards:	47 CFR Part 1.1307
	47 CFR Part 1.1310
	KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2019-06-27
Date of Test:	2019-06-28 to 2019-07-08
Date of Issue:	2019-07-08
Test Result :	**PASS***

Tested By：

(Tom chen)

Reviewed By:

(Aaron Ma)

Approved By:

(Jack Ai)

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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190600507E-02	Rev.01	Initial report	2019-07-08

2   Contents

3　General Information

3.1　Client Information

Applicant:	Kool Brands, LLC.
Address of Applicant:	P.O. box 41270 Reno, NV 89504
Manufacturer:	LITE STAR ELECTRONICS TECHNOLOGY Co.,Ltd.
Address of Manufacturer:	Xingchen Science park Lianbi Road, Wulian Industry Area, Fenggang Town, Dongguan City, China

3.2　General Description of EUT

Product Name:	Megadrive Bluetooth Receiver
Model No.:	RET00128, RB-SGA-010
	RET00128
Trade Mark:	Retro-Bit
Hardware Version:	REV:A1
Software Version:	ver_0D
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.2
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Transfer Rate:	1Mbps/2Mbps/3Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	☐ Mobile　　☒ Portable　　☐ Fix Location
Test Software of EUT:	RDA Host Controller Tester – HCDT1(manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	-1.42dBi
Power Supply:	DC5V

Note:

Model No.: RET00128, RB-SGA-010

Only the model RET00128 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, pack and model name.

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	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

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.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.2 1.1.3 EUT RF Exposure Evaluation

1) For BT

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.0 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power	Tune up tolerance	Maximum tune-up Power	
	(dBm)	(dBm)	(dBm)	(mW)
Lowest(2402MHz)	1.820	2±1	3	1.995
Middle(2441MHz)	2.640	2±1	3	1.995
Highest(2480MHz)	3.410	3±1	4	2.512
π/4DQPSK mode				
Test channel	Peak Output Power	Tune up tolerance	Maximum tune-up Power	
	(dBm)	(dBm)	(dBm)	(mW)
Lowest(2402MHz)	0.350	1±1	2	1.585
Middle(2441MHz)	1.720	1±1	2	1.585
Highest(2480MHz)	2.670	2±1	3	1.995
8DPSK mode				
Test channel	Peak Output Power	Tune up tolerance	Maximum tune-up Power	
	(dBm)	(dBm)	(dBm)	(mW)
Lowest(2402MHz)	0.820	1±1	2	1.585
Middle(2441MHz)	1.960	1±1	2	1.585
Highest(2480MHz)	2.860	2±1	3	1.995

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
2.512	0	0.0005	1.0	PASS

Note: 1) Refer to report No. CQASZ20190600507E-01 for EUT test Max Conducted Peak Output Power value.

2) $Pd = (Pout*G)/(4* Pi * R^2)=(2.512*1.0)/(4*3.1416*20^2)=0.0005$