



Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640

Fax: +86-755-26648637

Website: www.cqa-cert.com

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RF Exposure Evaluation Report

Report No.: CQASZ20210500713E-02
Applicant: Shenzhen Times Innovation Technology Co., Ltd
Address of Applicant: 5th Floor, Building B, Baseus Intelligence Park, No.2008, Xuegang Rd, Gangtou Community, Bantian Street, Longgang District, Shenzhen
Equipment Under Test (EUT):
EUT Name: Baseus Car Wireless MP3 Player
Model No.: CRTYN-01
Brand Name: Baseus
FCC ID: 2AY37-CRTNY
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2021-06-11
Date of Test: 2021-06-11 to 2021-06-23
Date of Issue: 2021-06-23
Test Result: PASS*

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

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Sheek Luo

(Sheek Luo)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210500713E-02	Rev.01	Initial report	2021-06-23

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3 General Information

3.1 Client Information

Applicant:	Shenzhen Times Innovation Technology Co., Ltd
Address of Applicant:	5th Floor, Building B, Baseus Intelligence Park, No.2008, Xuegang Rd, Gangtou Community, Bantian Street, Longgang District, Shenzhen
Manufacturer:	Shenzhen Times Innovation Technology Co., Ltd
Address of Manufacturer:	5th Floor, Building B, Baseus Intelligence Park, No.2008, Xuegang Rd, Gangtou Community, Bantian Street, Longgang District, Shenzhen
Factory:	Shenzhen youpinshi electronic technology co., LTD
Address of Factory:	No. 122, Ditang Road, Shasan Village, Shajing Street, Baoan District, Shenzhen, China

3.2 General Description of EUT

Product Name:	Baseus Car Wireless MP3 Player
Test Model No.:	CRTYN-01
Trade Mark:	Baseus
Hardware Version:	V2.4
Software Version:	V1.7
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Transfer Rate:	1Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	BT Tool
Antenna Gain:	PCB antenna
EUT Power Supply:	-0.58 dBi

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limitst

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/cm ²)	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/f ²)	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/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

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is 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.

4.1.3 EUT RF Exposure

1) For BT Classic

Antenna Gain: -0.58 dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.87 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	0.540	0±1	1	1.259
Middle(2441MHz)	-0.490	-1±1	0	1
Highest(2480MHz)	-1.390	-2±1	-1	0.794
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	2.740	2±1	3	1.995
Middle(2441MHz)	1.740	1±1	2	1.585
Highest(2480MHz)	0.810	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)	3.280	2.5±1	3.5	2.239
Middle(2441MHz)	2.300	1.5±1	2.5	1.778
Highest(2480MHz)	1.370	0.5±1	1.5	1.413

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
2.239	-0.58	0.00039	1.0	PASS

Note: 1) Refer to report No. CQASZ20210500713E-01 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (2.239 \cdot 0.87) / (4 \cdot 3.1416 \cdot 20^2) = 0.00039$

3) EUT's Bluetooth module is more than 20cm away from the human body.