

### 1 Cover Page

# RF Exposure Evaluation Report

**Application No.:** SHCR2304000695EV  
**FCC ID:** 2BAZLBHSD-A40A  
**IC:** 30442-BHSD40  
**Applicant:** Nlightend Smart Tech Co.,Ltd  
**Address of Applicant:** No.528, Daluzhou, Meilin street, Ninghai county, Ningbo, China  
**Manufacturer:** Nlightend Smart Tech Co.,Ltd  
**Address of Manufacturer:** No.528, Daluzhou, Meilin street, Ninghai county, Ningbo, China  
**Factory:** Nlightend Smart Tech Co.,Ltd  
**Address of Factory:** No.528, Daluzhou, Meilin street, Ninghai county, Ningbo, China  
**Equipment Under Test (EUT):**  
**EUT Name:** AC Charging Pile  
**Model No.:** BHSD-A50A  
**Add Model No.:** BHSD-A32A, BHSD-A40A  
**Standard(s) :** FCC Rules 47 CFR §2.1091  
 KDB447498 D01 General RF Exposure Guidance v06  
 RSS-102 Issue 5 Amendment 1 (February 2, 2021)  
**Date of Receipt:** 2023-04-10  
**Date of Test:** 2023-05-05 to 2023-05-17  
**Date of Issue:** 2023-05-30

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan

Parlam Zhan  
Laboratory Manager



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Revision Record			
Version	Description	Date	Remark
00	Original	2023-05-30	/

Authorized for issue by:			
		Bill Wu	
		Bill Wu/Project Engineer	
		Parlam Zhan	
		Parlam Zhan /Reviewer	



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### 3 General Information

#### 3.1 General Description of E.U.T.

Power supply:	AC 240V/60Hz
S/N:	BHZD-A40A-A1
Firmware Version:	V2.6

#### 3.2 Technical Specifications

##### BLE

Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V4.0 LE
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	2.54 dBi (Provided by manufacturer)

##### 2.4GHz WiFi

Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11
Channel Spacing:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain:	2.54 dBi (Provided by manufacturer)
Date Rate:	802.11b:1/2/5.5./11Mbps 802.11g:6/9/12/18/24/36/48/54Mbps 802.11n:MCS0-MCS7

##### 13.56MHz

Operation Frequency	13.56MHz
Modulation Technique:	ASK
Antenna Type:	Loop antenna
Number of Channel:	1



### 3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China.

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc ) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

### 3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• **ISED (CAB Identifier: CN0020)**

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Company Number: 8617A

• **VCCI (Member No.: 3061)**

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## 4 Test Standards and Limits

### 4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
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 <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Note: Limit for 2.4GHz is 1.0 mW/cm<sup>2</sup>

Limit for 13.56MHz is 60.77 V/m

### 4.2 IC Radiofrequency radiation exposure limits:

According to RSS-102 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:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- 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;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W

For 13.56MHz, the limit of worse case is 1W



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## 5 Measurement and Calculation

### 5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHCR230400069501, SHCR230400069502, SHCR230400069503

#### BLE

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum Peak Conducted Output Power (mW)
1M	SISO	2402	-2.8	<b>0.52</b>
		2440	-3.23	0.48
		2480	-3.41	0.46

#### 2.4GHz WiFi

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum Peak Conducted Output Power (mW)
802.11b	SISO	2412	15.90	38.90
		2437	16.03	40.09
		2462	16.07	<b>40.46</b>
802.11g	SISO	2412	13.73	23.60
		2437	13.91	24.60
		2462	13.93	24.72
802.11n (HT20)	SISO	2412	13.81	24.04
		2437	14.08	25.59
		2462	13.99	25.06

**13.56MHz:** 61.63 dBuV/m @3m, @20cm=@3m+40log(3/0.02)=148.67 dBuV/m



## 5.2 MPE Calculation

For FCC ID:

According to the formula  $S=P/4\pi R^2$ , we can calculate S which is MPE.

Note:

- 1) P (mW)
- 2) R = distance to the center of radiation of antenna (in meter) = 20cm
- 3) MPE limit = 1mW/cm<sup>2</sup>

For BLE

The max. antenna gain is 2.54 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
0.52	1.795	20	0.00019	1	Pass

For 2.4GHz WiFi

The max. antenna gain is 2.54 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
40.46	1.795	20	0.01445	1	Pass

For 13.56MHz: 148.67dBuV/m=27.13V/m< 60.77 V/m.

The 2.4GHz band and BLE band and 13.56MHz function can simultaneous transmitting. But the maximum rate of MPE is  $0.000019/1.0+0.01445/1.0+27.13/60.77=0.46\leq 1.0$ . according to the KDB447498 section 7.2 determine the device is exclusion from SAR test.

For IC:

For BLE

$$E.I.R.P.= P \cdot G = 0.00052 \times 1.79 = 0.0009W < 2.68W$$

For 2.4GHz WiFi:

$$E.I.R.P.= P \cdot G = 0.04046 \times 1.79 = 0.072W < 2.68W$$

For 13.56MHz:

$$E.I.R.P.= 61.63dBuV/m = 0.43W < 1W$$

The 2.4GHz band and BLE band and 13.56MHz can simultaneous transmitting, so the maximum rate of MPE is  $0.0009/2.68+0.072/2.68+0.43/1=0.46\leq 1$ .

So the device is exclusion from SAR test

--End of the Report--



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