



1 Cover Page

RF Exposure Evaluation Report

Application No.: SHCR2109000250CO
FCC ID: 2A3IU-ABBCDJUNO15-A
IC 27886-ABBJUNO15
Applicant: ABB B.V.
Address of Applicant: George Hintzenweg 81, 3068 AX, Rotterdam, The Netherlands
Manufacturer: ABB Chargedot Shanghai New Energy Technology Co., Ltd.
Address of Manufacturer: Unit C,D,E, 12th Floor, WESTLINK Tower D, No.2337, Gudai Road, Minhang District, Shanghai, China
Factory: Zhejiang Chargedot New Energy Technology Co., Ltd.
Address of Factory: No. 2368, Hongjian Road, Jiaxing Pinghu City, Zhejiang Province, China
Equipment Under Test (EUT):
EUT Name: Terra AC Wallbox Charging Station
Model No.: Terra AC W19-P8-RD-MCD-0
Add Model No.: Terra AC W9-P8-R-D-0, Terra AC W9-P8-R-CD-0, Terra AC W9-P8-RD-MCD-0, Terra AC W19-P8-R-D-0, Terra AC W19-P8-R-CD-0
Trade mark: ABB
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: 2021-09-22
Date of Test: 2021-10-12 to 2021-10-21
Date of Issue: 2021-10-27

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan

Parlam Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
Testing Center EMC Laboratory

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Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

NO. 588 West Jindu Road, Songjiang District, Shanghai, China 201612
中国·上海·松江区金都西路588号 邮编: 201612

t(86-21) 61915666 f(86-21) 61915678 www.sgsgroup.com.cn
t(86-21) 61915666 f(86-21) 61915678 e sgs.china@sgs.com



Revision Record			
Version	Description	Date	Remark
00	Original	2021-10-27	/

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 208V/240V,50/60Hz
S/N:	TACW19-4-2621-G0001
Firmware:	V1.4.5

BLE:

Antenna Gain:	0.82dBi (Provided by manufacturer)
Antenna Type:	PIFA Antenna
Bluetooth Version:	5.0 LE
Data Rate:	1Mbps
Channel Spacing:	2MHz
Number of Channels:	40
Modulation Type:	GFSK
Operation Frequency:	2402MHz to 2480MHz

NFC:

Antenna Type:	Loop Antenna
Number of Channel:	1
Center Frequency:	13.56MHz
Modulation Type:	ASK

Contains Wireless Module: HF-LPT230

2.4G WiFi:

Antenna Gain:	Antenna:-0.35dBi (Provided by manufacturer)
Antenna Type:	PCB
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
Date Rate:	802.11b:1/2/5.5./11Mbps 802.11g:6/9/12/18/24/36/48/54Mbps 802.11n:MCS0-MCS7



Contains Wireless Module: EC25-AFX

3G

WCDMA Operation Frequency Band:	WCDMA Band II,Band V,Band IV
Modulation Type:	QPSK, 16QAM
Antenna Type:	FPC Antenna
Antenna Gain:	WCDMA Band II: 3.5dBi WCDMA Band V: 3.5dBi WCDMA Band IV: 1.0dBi

4G

LTE Operation Frequency Band:	LTE FDD Band 2, 4, 5, ,12,13,14,66,71
Modulation Type:	QPSK, 16QAM
Antenna Type:	FPC Antenna
Antenna Gain:	Band 2: 3.5dBi Band 4: 3.5dBi Band 5: 1.0dBi Band 12: 1.0dBi Band 13: 1.0dBi Band 14: 1.0dBi Band 66: 3.5dBi Band 71: 1.0dBi

Note:LTE Band 71 was not support for IC.

3.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch

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

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678



3.3 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **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)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory
Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

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

Frequency	Power density(mW/cm ²)	Averaging time(minutes)
300MHz~1.5GHz	$f/1500$	30
1.5GHz~100GHz	1.0	30

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 13.56 device, the limit of worse case is 1W

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

For WCDMA II, the limit of worse case is 2.24W

For WCDMA IV, the limit of worse case is 2.12W

For WCDMA V, the limit of worse case is 1.29W

For LTE Band 2, the limit of worse case is 2.24W

For LTE Band 4, the limit of worse case is 2.12W

For LTE Band 5, the limit of worse case is 1.29W

For LTE Band 12, the limit of worse case is 1.15W

For LTE Band 13, the limit of worse case is 1.24W

For LTE Band 14, the limit of worse case is 1.25W

For LTE Band 66, the limit of worse case is 2.12W

5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM190101016501

Test Mode	Test Channel	Power[dBm]	EIRP[dBm]	EIRP (mW)
BLE	2402	0.96	1.78	1.51
BLE	2440	1.05	1.87	1.54
BLE	2480	0.75	1.57	1.44

The power for 4G modular EC25-AFX refer certificate of FCC ID:XMR201909EC25AFX;IC:10224A-2019EC25AFX

Band	Max Power[dBm]	EIRP[dBm]	EIRP (mW)
WCDMA II	25	28.5	707.95
WCDMA IV	25	28.5	707.95
WCDMA V	25	26	398.11
LTE Band 2	25	28.5	707.95
LTE Band 4	25	28.5	707.95
LTE Band 5	25	26	398.11
LTE Band 12	25	26	398.11
LTE Band 13	25	26	398.11
LTE Band 14	25	26	398.11
LTE Band 66	25	28.5	707.95
LTE Band 71	25	26	398.11



The power for 2.4G WiFi modular HF-LPT230 refer certificate of FCC ID:2ACSV-HF-LPT230;IC:12243A-HFLPT

Test Mode	Test Channel	Power [dBm]	EIRP[dBm]	EIRP [mW]
11B	2412	15.70	15.35	34.28
11B	2437	15.89	15.54	35.81
11B	2462	15.85	15.50	35.48
11G	2412	13.08	12.73	18.75
11G	2437	13.22	12.87	19.36
11G	2462	13.29	12.94	19.68
11N20SISO	2412	12.75	12.40	17.38
11N20SISO	2437	12.90	12.55	17.99
11N20SISO	2462	12.29	11.94	15.63
11N40SISO	2442	11.92	11.57	14.35
11N40SISO	2437	11.75	11.40	13.80
11N40SISO	2452	11.33	10.98	12.53

5.2 MPE Calculation

For FCC

According to the formula $S = \frac{PG}{4R^2\pi}$, we can calculate S which is MPE.

Note:

- 1) P (Watts)
- 2) G (Antenna gain in numeric)
- 3) R = distance to the center of radiation of antenna (in meter) = 20cm
- 4) MPE limit = 1mW/cm²

For WiFi:

$$S = \frac{PG}{4R^2\pi} = \frac{35.81}{4 \times 400 \times 3.14} = 0.007 \text{ mW/cm}^2 < 1.0$$

For BLE:

$$S = \frac{PG}{4R^2\pi} = \frac{1.54}{4 \times 400 \times 3.14} = 0.0003 \text{ mW/cm}^2 < 1.0$$

For 4G Module:

$$\text{WCDMA II: } S = \frac{PG}{4R^2\pi} = \frac{707.95}{4 \times 400 \times 3.14} = 0.14 \text{ mW/cm}^2 < 1.0$$

$$\text{WCDMA IV: } S = \frac{PG}{4R^2\pi} = \frac{707.95}{4 \times 400 \times 3.14} = 0.155 \text{ mW/cm}^2 < 1.0$$

$$\text{WCDMA V: } S = \frac{PG}{4R^2\pi} = \frac{398.11}{4 \times 400 \times 3.14} = 0.08 \text{ mW/cm}^2 < 0.55$$

$$\text{LTE Band 2: } S = \frac{PG}{4R^2\pi} = \frac{707.95}{4 \times 400 \times 3.14} = 0.14 \text{ mW/cm}^2 < 1.0$$

$$\text{LTE Band 4: } S = \frac{PG}{4R^2\pi} = \frac{707.95}{4 \times 400 \times 3.14} = 0.14 \text{ mW/cm}^2 < 1.0$$

$$\text{LTE Band 5: } S = \frac{PG}{4R^2\pi} = \frac{398.11}{4 \times 400 \times 3.14} = 0.08 \text{ mW/cm}^2 < 0.55$$

$$\text{LTE Band 12: } S = \frac{PG}{4R^2\pi} = \frac{398.11}{4 \times 400 \times 3.14} = 0.08 \text{ mW/cm}^2 < 0.47$$

$$\text{LTE Band 13: } S = \frac{PG}{4R^2\pi} = \frac{398.11}{4 \times 400 \times 3.14} = 0.08 \text{ mW/cm}^2 < 0.52$$

$$\text{LTE Band 14: } S = \frac{PG}{4R^2\pi} = \frac{398.11}{4 \times 400 \times 3.14} = 0.08 \text{ mW/cm}^2 < 0.53$$

$$\text{LTE Band 66: } S = \frac{PG}{4R^2\pi} = \frac{707.95}{4 \times 400 \times 3.14} = 0.14 \text{ mW/cm}^2 < 1.0$$



$$\text{LTE Band 71: } S = \frac{PG}{4R^2\pi} = \frac{398.11}{4 \times 400 \times 3.14} = 0.08 \text{ mW/cm}^2 < 0.45$$

4G Module and WiFi module and BLE module can simultaneous transmitting, but the maximum rate

of MPE is $\frac{0.08}{0.47} + \frac{0.0007}{1.0} + \frac{0.0003}{1.0} = 0.17 \leq 1.0$. So the device is exclusion from SAR test.

For IC:

For RFID:

E.I.R.P.=0.00000001<1W

For 2.4GHz WiFi:

E.I.R.P.= P*G= 0.036W<2.68W

For 2.4GHz BLE:

E.I.R.P.= P*G= 0.002W<2.68W

For 4G module:

WCDMA II: E.I.R.P.= P*G=0.71W<2.24W

WCDMA IV: E.I.R.P.= P*G=0.71W<2.12W

WCDMA V: E.I.R.P.= P*G=0.40W<1.29W

LTE Band 2: E.I.R.P.= P*G=0.71W<2.24W

LTE Band 4: E.I.R.P.= P*G=0.71W<2.12W

LTE Band 5: E.I.R.P.= P*G=0.40W<1.29W

LTE Band 12: E.I.R.P.= P*G=0.40W<1.15W

LTE Band 13: E.I.R.P.= P*G=0.40W<1.24W

LTE Band 14: E.I.R.P.= P*G=0.40W<1.25W

LTE Band 66: E.I.R.P.= P*G=0.71W<2.12W

2.4G WiFi and BLE and 4G modules and RFID can simultaneous transmitting, but the maximum rate of MPE is $0.036/2.68 + 0.002/2.68 + 0.71/2.12 + 0.00000001/1 = 0.33 \leq 1$. So the device is exclusion from SAR test

--End of the Report--