



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

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250700293108

Page: 1 of 17

RF EXPOSURE EVALUATION REPORT

Application No.: SZCR2507002931AT
Applicant: Solaborate Inc.
Address of Applicant: 2605 Enterprise RD E Suite 150, Clearwater, Florida, 33759, United States
Manufacturer: Solaborate Inc.
Address of Manufacturer: 2605 Enterprise RD E Suite 150, Clearwater, Florida, 33759, United States
Equipment Under Test (EUT):
EUT Name: RoomSign
Model No.: HC1033T, HC1383T, HC1583T, HC2183T ♣
♣ Please refer to section 3.2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark: hellocare.ai
FCC ID: 2AW3M-ROOMSIGN-H
Standard(s) : FCC Rules 47 CFR §2.1091
KDB 447498 D04 interim General RF Exposure Guidance v01
Date of Receipt: 2025-07-07
Date of Evaluation: 2025-07-11 to 2025-08-06
Date of Issue: 2025-08-11

Evaluation Result:	Pass*
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* In the configuration evaluated, the EUT complied with the standards specified above.

Keny Xu

EMC Laboratory Manager



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SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch EMC Laboratory

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2025-08-11		Original

Authorized for issue by:				
		Edison Li		
		Edison Li/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

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3 General Information

3.1 General Description of E.U.T.

Product Type:	☐ Portable device
	☒ Mobile device
	☐ Fixed device

3.2 Details of E.U.T.

Power supply:	Switching Adapter(HC2183T) Model: FJ-SW20172014000 Input: AC 100-240V, 50/60Hz, 1.5A Max Output: DC 12.0V, 4.0A, 48.0W Switching Adapter(HC1583T) Model: FJ-SW126G1202000U Input: AC 100-240V, 50/60Hz, 0.6A Max Output: DC 12.0V, 2.0A Switching Adapter(HC1383T) Model: FJ-SW126G1202000U Input: AC 100-240V, 50/60Hz, 0.6A Max Output: DC 12.0V, 2.0A Switching Adapter(HC1033T) Model: FJ-SW126G1201500U Input: AC 100-240V, 50/60Hz, 0.6A Max Output: DC 12.0V, 1.5A
Cable(s):	AC cable:140cm unshielded DC cable:140cm with a ferrite core
For BT:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.1
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Antenna Type:	PIFA Antenna

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Antenna Gain:	HC1033T: 2.68dBi, HC1383AT: 4.13dBi, HC1583T: 3.0dBi, HC2183T: 1.86dBi.
For BLE:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.1
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Data rate:	1Mbps, 2Mbps
Antenna Type:	PIFA Antenna
Antenna Gain:	HC1033T: 2.68dBi, HC1383AT: 4.13dBi, HC1583T: 3.0dBi, HC2183T: 1.86dBi.
For 2.4G WIFI:	
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	802.11b: DSSS (DBPSK, DQPSK, CCK); 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM);
Number of Channels:	802.11b/g/n(HT20):11
Channel Spacing:	5MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	HC1033T: 2.68dBi, HC1383AT: 4.13dBi, HC1583T: 3.0dBi, HC2183T: 1.86dBi.
For 5G WIFI:	
Operation Frequency/Number of channels (20MHz):	U-NII-1: 5180-5240MHz (4 Channels); U-NII-3: 5745-5825MHz (5 Channels)
Operation Frequency/Number of channels/(40MHz):	U-NII-1: 5190-5230MHz (2 Channels); U-NII-3: 5755-5795MHz (2 Channels)
Operation Frequency/Number of channels (80MHz):	U-NII-1: 5210MHz (1 Channel); U-NII-3: 5775MHz (1 Channel)
Modulation Type:	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:	802.11a/n/ac 20: 20MHz; 802.11n/ac 40: 40MHz; 802.11ac 80: 80MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	HC1033T: 3.75dBi, HC1383AT: 3.14dBi, HC1583T: 2.69dBi, HC2183T: 2.99dBi.



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For 125KHz	
Operation Frequency:	125KHz
Modulation Type:	ASK
Antenna Type:	Loop Antenna
For NFC	
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	Loop Antenna

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

Declaration of EUT Family Grouping:

Model No.: HC1033T, HC1383T, HC1583T, HC2183T

According to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on model No., appearance size, power adapter, color and antenna (same antenna type, different antenna gain).

3.3 Separation Distance

Minimum test separation distance:	20cm
Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.	



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3.4 Test Location

All tests were performed at:

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

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

3.5 Test Facility

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

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

3.6 Deviation from Standards

None

3.7 Abnormalities from Standard Conditions

None

4 FCC Radiofrequency radiation exposure limits

Test exemptions apply for devices used in general population/uncontrolled exposure environments, according to the SAR-based, or MPE-based exemption thresholds.

4.1 Blanket 1 mW Blanket Exemption

The 1 mW Blanket Exemption of §1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

The 1-mW blanket exemption applies at separation distances less than 0.5 cm, including where there is no separation. This exemption shall not be used in conjunction with other exemption criteria other than those for multiple RF sources in paragraph §1.1307(b)(3)(ii)(A).

The 1-mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it shall not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period. Exposure from such higher-power transmitters would invalidate the underlying assumption that exposure from the lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

4.2 MPE-based Exemption

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table B.1—Thresholds For Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	—	1.34	159 m	—	35.6 m	1,920 R ²
1.34	—	30	35.6 m	—	1.6 m	3,450 R ² /f ²
30	—	300	1.6 m	—	159 mm	3.83 R ²
300	—	1,500	159 mm	—	31.8 mm	0.0128 R ² f
1,500	—	100,000	31.8 mm	—	0.5 mm	19.2R ²

Subscripts L and H are low and high; λ is wavelength.
From §1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.

The table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are

based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.

For mobile devices that are not exempt per Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from §2.1091(c)(1); also in §1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

Limit calculation			
Frequency range	Frequency(MHz)	$R(\lambda/2\pi)(m)$	Threshold ERP(W)
300~1500MHz	915	0.0522	0.032
1500~100000MHz	2480	0.0193	0.007

4.3 SAR-based Exemption

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of $\lambda/4$.

As for devices with antennas of length greater than $\lambda/4$ where the gain is not well defined, but always less than that of a half-wave dipole (length $\lambda/2$), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.



The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

The SAR-based exemption formula of §1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

Example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance(mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

Limit calculation				
Frequency range(GHz)	Frequency(GHz)	X	Distance(cm)	Pth (mW)
0.3~1.5	0.915	1.474	0.5	8.133
1.5~6	2.48	1.905	0.5	2.717

5 Measurement and Calculation

5.1 Maximum transmit power for Bluetooth/WiFi

Standalone transmission

Test Mode	Frequency (MHz)	Maximum Conducted power [dBm]	Maximum Conducted power (mW)	Limit(mw)	Ratio	Verdict
BT	2441	6.92	4.92	3060	0.00161	Pass

Test Mode	Frequency (MHz)	Maximum EIRP power [dBm]	Maximum EIRP power (mW)	Limit(mw)	Ratio	Verdict
BT	2441	11.05	12.74	3060	0.00416	Pass

Test Mode	Frequency (MHz)	Maximum Conducted power [dBm]	Maximum Conducted power (mW)	Limit(mw)	Ratio	Verdict
BLE	2440	4.06	2.55	3060	0.00083	Pass

Test Mode	Frequency (MHz)	Maximum EIRP power [dBm]	Maximum EIRP power (mW)	Limit(mw)	Ratio	Verdict
BLE	2440	8.19	6.59	3060	0.00215	Pass

Test Mode	Frequency (MHz)	Maximum Conducted power [dBm]	Maximum Conducted power (mW)	Limit(mw)	Ratio	Verdict
2.4G WIFI	2462	16.29	42.56	3060	0.01391	Pass

Test Mode	Frequency (MHz)	Maximum EIRP power [dBm]	Maximum EIRP power (mW)	Limit(mw)	Ratio	Verdict
2.4G WIFI	2462	20.42	110.15	3060	0.03600	Pass

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Test Mode	Frequency (MHz)	Maximum Conducted power [dBm]	Maximum Conducted power (mW)	Limit(mw)	Ratio	Verdict
5G WIFI	5745	14.96	31.33	3060	0.01024	Pass

Test Mode	Frequency (MHz)	Maximum EIRP power [dBm]	Maximum EIRP power (mW)	Limit(mw)	Ratio	Verdict
5G WIFI	5745	18.71	74.30	3060	0.02428	Pass

Note 1: BT/BLE Power Data is based on the RF Test Report SZCR250700293102 and SZCR250700293103.

2. 2.4G WIFI Power Data is based on the RF Test Report SZCR250700293104.

3. 5G WIFI Power Data is based on the RF Test Report SZCR250700293105.

3. Use the maximum power between the conducted power and ERP/EIRP to perform RF exposure exemption evaluation.



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5.2 Maximum transmit power for NFC/125KHz

5.2.1 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T14	REF. No.SEA18F01A

5.2.2 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Due date
1	3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2026/05/09
2	Electric and Magnetic Field Probe - Analyzer(9kHz-30MHz)	Narda	EHP-200A	SEM022-18	2026/04/02

EHP-200A Probe parameter:

www.narda-sts.com

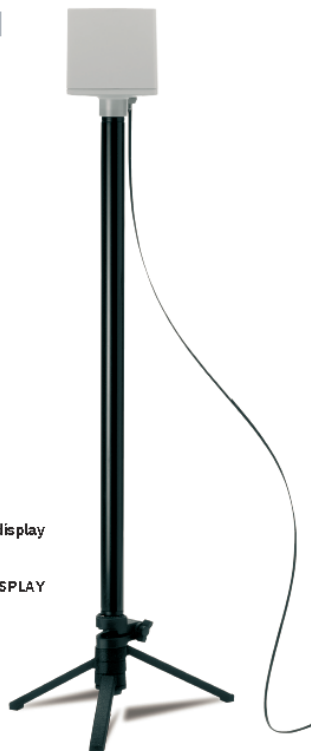
ELECTRIC AND MAGNETIC FIELD ANALYZER

EHP-200A / EHP-200AC

narda
Safety Test Solutions

Selective and broadband high frequency field analysis

- ▲ Powerful receiver for selective and wideband measurements in all 3 spatial directions
- ▲ Isotropic measurements in the 9 kHz to 30 MHz range EHP-200A in the 3 kHz to 30 MHz range EHP-200AC
- ▲ Electric Fields from 0.02 to 1000 V/m
- ▲ Magnetic Fields from 0.6 mA/m to 300 A/m EHP-200A from 6 mA/m to 1000 A/m EHP-200AC
- ▲ Built-in Frequency Spectrum Analysis
- ▲ Built-in rechargeable Li-Ion battery
- ▲ Optical interface for remote control and result display avoids distortion of the field under test
- ▲ Control and display using a PC or the 8053 DISPLAY Broadband Field Meter



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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn
中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

5.2.3 E.U.T. Operation

Operating Environment:

Temperature: 22.4 °C

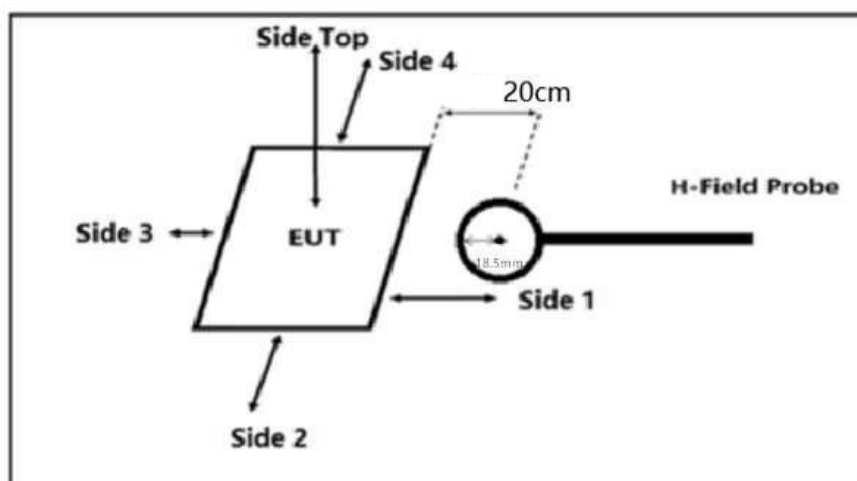
Humidity: 46.7 % RH

Atmospheric Pressure: 1020 mbar

5.2.4 Test mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode with modulation(125KHz).
Final test	01	TX mode with modulation(13.56MHz).

5.2.5 Test Block Diagram



5.2.5 Limit

According to 47 CFR PART 1, Subpart I, Section 1.1310, the criteria listed in the below table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified table 1.

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
 *=Plane-wave equivalent power density
 RF exposure compliance will need to be determined with respect to 1.1310(b), (c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 125kHz:614V/m,1.63A/m).

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5.2.6 Measurement Data

Test mode:00

Magnetic Field Emissions

Operation Frequency	Test Distance(cm)	Test Position	Probe Measure Result (A/m)
125 kHz	20	Side 1	0.0428
		Side 2	0.0377
		Side 3	0.0104
		Side 4	0.0079
		Top	0.0025

Electric Field Emissions

Operation Frequency	Test Distance(cm)	Test Position	Probe Measure Result (V/m)
125 kHz	20	Side 1	0.3655
		Side 2	0.2764
		Side 3	0.2118
		Side 4	0.1277
		Top	0.0478

Test mode:01

Magnetic Field Emissions

Operation Frequency	Test Distance(cm)	Test Position	Probe Measure Result (A/m)
13.56MHz	20	Side 1	0.0618
		Side 2	0.0588
		Side 3	0.0517
		Side 4	0.0166
		Top	0.0027

Electric Field Emissions

Operation Frequency	Test Distance(cm)	Test Position	Probe Measure Result (V/m)
13.56MHz	20	Side 1	0.6377
		Side 2	0.5504
		Side 3	0.4346
		Side 4	0.1923
		Top	0.0237



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5.2.7 Standalone transmission

Test Mode	Frequency (MHz)	Magnetic Field Emissions(A/m)	Electric Field Emissions(V/m)	Limit(A/m)	Limit(V/m)	Magnetic Field Emissions Ratio	Electric Field Emissions Radio
125kHz	0.125	0.0428	0.3655	1.63	614	0.0263	0.0006
NFC	13.56	0.0618	0.6377	0.1615	60.7670	0.3827	0.0105

Simultaneous transmission

Test Mode	125kHz	NFC	BT/BLE 2.4G/5G WiFi	Total Ratio	Limit	Result
Ratio	0.0263	0.3827	0.03600	N/A	N/A	N/A
Scenario 1	☒	☒	☒	0.4450	1.0	Pass

6 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for SZCR2507002931AT

-End of the Report-