

Report No.: SZEM200100011004

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RF Exposure Evaluation Report

Application No.:SZEM2001000110CRApplicant:ZKTECO CO., LTD.

Address of Applicant: No.26, Pingshan 188 Industry zone, Tangxia Town, Dongguan City,

Guangdong Province, China 523728

Manufacturer: ZKTECO CO., LTD.

Address of Manufacturer: No.26, Pingshan 188 Industry zone, Tangxia Town, Dongguan City,

Guangdong Province, China 523728

Factory: ZKTECO CO., LTD.

Address of Factory: No.26, Pingshan 188 Industry zone, Tangxia Town, Dongguan City,

Guangdong Province, China 523728

Equipment Under Test (EUT):

Product Name: Smart Access Control Terminal

Model No.: SpeedFace-H5L FCC ID: 2AJ9T-H5MW

Standards: 47 CFR PART 1, Subpart I, Section 1.1307

47 CFR PART 1, Subpart I, Section 1.1310 47 CRF PART 2, Subpart J, Section 2.1091

KDB 447498 D01 General RF Exposure Guidance v06

Date of Receipt: 2020-01-03

Date of Test: 2020-01-07 to 2020-05-12

Date of Issue: 2020-06-01

Test Result : PASS*

Keny Xu EMC Laboratory Manager

Ceny. Ku



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



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2 Version

	Revision Record						
Version	Chapter	Date	Modifier	Remark			
01		2020-06-01		Original			

Authorized for issue by:		
	Damon Su	
	Damon Su /Project Engineer	-
	EvicFu	
	Eric Fu /Reviewer	



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4 General Information

4.1 General Description of EUT

Power Supply:	DC 12V 3A.			
	Adapter Model: ADS-40SI-12-3 12036E			
	Input: AC 100-240V 50/60Hz 1.0A			
	Output: 12V 3A			
Cable:	AC Cable:150cm unshielded			
WIFI				
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz			
	802.11n(HT40): 2422MHz to 2452MHz			
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			
Channel Spacing:	5MHz			
Antenna Type:	PIFA Antenna			
Antenna Gain:	1.78dBi			
NFC				
Operation Frequency:	13.56MHz			
Modulation Type:	ASK			
Antenna Type:	Loop Antenna			



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4.2 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, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 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

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. 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: CN1178

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

Designation Number: CN1178. Test Firm Registration Number: 406779.

• 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.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



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5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 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)

Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)				
(A) Limits for Occupational/Controlled Exposures							
614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6				
(B) Limits for General Population/Uncontrolled Exposure							
614 824/ī 27.5	1.63 2.19/f 0.073	*(100) *(180/f²) 0.2 f/1500	30 30 30 30 30				
	strength (V/m) its for Occupational 614 1842/f 61.4 for General Populati 614 824/f 27.5	Strength (V/m) Strength (A/m)	Strength (V/m) Strength (A/m) Power defisity (mW/cm²)				

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.

5.1.2 Test Procedure

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



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5.1.3 EUT RF Exposure Evaluation

Antenna Gain: 1.78dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.507 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency	Max Conducted	Output Power	Power Density	Limit	Result
	(MHz)	Peak Output	to Antenna	at R = 20 cm		
		Power (dBm)	(mW)	(mW/cm ²)		
Lowest	2412	19.79	95.28	0.0286	1.0	PASS

Note: Refer to report No. SZEM200100011002 for EUT test Max Conducted Peak Output Power value. The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For NFC

The Max. power (including tune-up tolerance) is -50.5dBm(0.00002mW) (*)

Frequency	Output	Output Power	Power Density	Limit	Result
(MHz)	Power (dBm)	to Antenna	at R = 20 cm	(mW/cm ²)	
		(mW)	(mW/cm ²)		
13.56	-56.64	0.000002	0.0000000004	0.98	PASS

(*) Refer to test report SZEM200100011003 for EUT test Max Conducted Peak Output Power(including tune-up tolerance) value.

E=EIRP-20logD+104.7

E=28.06dBuv/m(Refer to test report SZEM200100011003)

D=10m

EIRP=28.06- (-20log(10)+104.7) EIRP=-56.64dBm(0.000002mW)

2) Exposure condition for simultaneous transmission operations

Simultaneous transmission MPE test is not required, because the Max. sum of the MPE ratios for WIFI and NFC is $0.0286/1.0+0.0000000004/0.98 \approx 0.03 < 1.0$

- End of the Report -



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