

SAR Evaluation Report

Application No.: SZEM1812001087CR
Applicant: SHENZHEN GIEC DIGITAL CO., LTD
Address of Applicant: 1st&3rd Building, No.26 Puzai Road, Pingdi, Longgang District, Shenzhen, China
Manufacturer: SHENZHEN GIEC DIGITAL CO., LTD
Address of Manufacturer: 1st&3rd Building, No.26 Puzai Road, Pingdi, Longgang District, Shenzhen, China
Factory: SHENZHEN GIEC DIGITAL CO., LTD
Address of Factory: 1st&3rd Building, No.26 Puzai Road, Pingdi, Longgang District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: Hubitat Elevation Hub
Model No.: C-5
Trade mark: Hubitat
FCC ID: 2AHYK-1218C5
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2018-12-27
Date of Test: 2019-01-04 to 2019-01-08
Date of Issue: 2019-01-10

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

Keny Xu
EMC Laboratory Manager



2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-01-10		Original

Authorized for issue by:			
			
		<hr/> Leo Li /Project Engineer	
			
		<hr/> Eric Fu /Reviewer	



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4 General Information

4.1 General Description of EUT

Power supply:	DC 5V from adapter input AC 120V/60Hz Adapter Model: TEKA006-0501000UK Input:AC100-240V 50/60Hz 0.3A Output: DC 5V 1A
Cable:	USB cable: 80cm shielded
For Zigbee:	
Operation Frequency:	2405MHz to 2480MHz
Modulation Type:	O-QPSK
Number of Channels:	16
Channel Spacing:	5MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	2.35dBi
For Z-Waves:	
Operation Frequency:	908.4MHz, 916MHz
Modulation Type:	GFSK
Number of Channels:	2
Antenna Type:	FPC Antenna
Antenna Gain:	1.64dBi



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:

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 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. 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.



5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

5.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

5.1.3 EUT RF Exposure

For Zigbee, the Max. power(including turn-up tolerance) is 6dBm(3.981mW) @ 2405MHz

For Z-Waves, the the Max. power(including turn-up tolerance) is -4.9dBm(90.3dBuV)(0.324mW) @916MHz

Max. power refer to Report No.:SZEM181200108702; SZEM181200108703

1 According to KDB 447498 section 4.3.1 a), For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR, where } f(\text{GHz}) \text{ is the RF channel transmit frequency in GHz}$$

For Zigbee, the min. test separation distance (mm) is 5mm

$$3.981/5 \cdot \sqrt{2.405} \leq 3.0$$

For Z-Waves, the min. test separation distance (mm) is 5mm

$$0.324/5 \cdot \sqrt{0.916} \leq 3.0$$

So the SAR test is not required.



2 According to KDB 447498 section 4.3.2 b), when an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

- (1) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$, for test separation distances $\leq 50 \text{ mm}$; where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.
- (2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is $>50\text{mm}$

For Zigbee:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] = 3.981/5 \cdot [\sqrt{2.405/7.5}] = 0.1646$

So, the estimated SAR1 for EUT is 0.1646 W/kg (1-g).

For Z-Waves:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] = 0.324/5 \cdot [\sqrt{0.916/7.5}] = 0.0083$

So, the estimated SAR2 for EUT is 0.0083 W/kg (1-g).

The sum of SAR is (SAR1+SAR2) = (0.1646 + 0.0083) = 0.1729 W/kg (1-g) < 1.6 W/kg (1-g)

So the SAR test is not required.

- End of the Report -

