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Report Template Version: V05
Report Template Revision Date: 2021-11-03

RF Exposure Evaluation Report

Report No.:	CQASZ20230200113E-02
Applicant:	Shenzhen Star Instrument Co., Ltd.
Address of Applicant:	Star Industrial Park, Baolong Industrial City, Longgang District, Shenzhen, China
Equipment Under Test (EUT):	
EUT Name:	Wi-SUN Communication Module for Meter
Model No.:	MJ001-01
Test Model No.:	MJ001-01
Brand Name:	STAR INSTRUMENT
FCC ID:	2A2X4-MJ001-01
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 447498 D04 Interim General RF Exposure Guidance v01
Date of Receipt:	2023-02-06
Date of Test:	2023-02-06 to 2023-02-16
Date of Issue:	2023-02-24
Test Result:	**PASS***

***In the configuration tested, the EUT complied with the standards specified above**

Tested By: lewis zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By:
(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20230200113E-02	Rev.01	Initial report	2023-02-24

2 Contents

Page

3 General Information

3.1 Client Information

Applicant:	Shenzhen Star Instrument Co., Ltd.
Address of Applicant:	Star Industrial Park, Baolong Industrial City, Longgang District, Shenzhen, China
Manufacturer:	Shenzhen Star Instrument Co., Ltd.
Address of Manufacturer:	Star Industrial Park, Baolong Industrial City, Longgang District, Shenzhen, China
Factory:	Shenzhen Star Instrument Co., Ltd.
Address of Factory:	Star Industrial Park, Baolong Industrial City, Longgang District, Shenzhen, China

3.2 General Description of EUT

Product Name:	Wi-SUN Communication Module for Meter
Model No.:	MJ001-01
Test Model No.:	MJ001-01
Trade Mark:	STAR INSTRUMENT
Software Version:	V1.2.2000
Hardware Version:	MJ001-01-A11
EUT Power Supply:	Power supply DC 5V form computer

3.3 General Description

Operation Frequency:	915.2MHz~927.8MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK
Number of Channel:	64
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	PCB antenna
Antenna Gain:	1.71dBi

Note：

The above parameters will directly affect the test results. The information is provided by the applicant.

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

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 ERP20cm inFormula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

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.

4.1.2 Test Procedure

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

4.1.3 EUT RF Exposure

1) For 915.2MHz~927.8MHz

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(915.2MHz)	17.46	15.31	15.5±1	16.5	44.67
Middle(921.6MHz)	17.66	15.51	15.5±1	16.5	44.67
Highest(927.8MHz)	16.98	14.83	15.0±1	16.0	39.81

The ERP of this product is less than 3060mW

Note: 1) Refer to report No. CQASZ20230200113E-01 for EUT test Max Conducted Peak Output Power value.

2) EUT's module is more than 20cm away from the human body.

*** END OF REPORT ***