RF Exposure Evaluation Report

Product	:	LoRaWAN Barometric Pressure Sensor - US915
Trade mark	:	Seeed studio
Model/Type reference	:	LoRa-S-915-Baro-01
Serial Number	:	N/A
Report Number	:	EED32L00335502
FCC ID	:	Z4T-WSNNODE01
Date of Issue	:	May 14, 2020
Test Standards	:	47 CFR Part 1.1307 47 CFR Part 2.1091 KDB447498D01v06
Test result	:	PASS

Prepared for:

Seeed Technology Co., Ltd.
9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C

Prepared by:

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	Ware Xin		Sam Chuang
Date:	May 14, 2020		Check No.:3096332299

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. Report Seal

2 Version

Version No.	Date	Description
00	May 14, 2020	Original

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4 General Information

4.1 Client Information

Applicant:	Seeed Technology Co., Ltd.
Address of Applicant:	9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C
Manufacturer:	Seeed Technology Co., Ltd.
Address of Manufacturer:	9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C

4.2 General Description of EUT

Product Name:	LoRaWAN Barometric Pressure Sensor - US915
Model No.(EUT):	LoRa-S-915-Baro-01
Trade Mark:	Seeed studio
EUT Supports Radios application	903.9MHz, 904.1MHz, 904.3MHz, 904.5MHz, 904.7MHz, 904.9MHz, 905.1MHz, 905.3MHz

4.3 Product Specification subjective to this standard

Frequency Range:	903.9MHz, 904.1MHz, 904.3MHz, 904.5MHz, 904.7MHz, 904.9MHz, 905.1MHz, 905.3MHz
Modulation Type:	LoRa
Number of Channels:	8
Test Power Grade:	Default
Test Software of EUT:	Default
Antenna Type:	FPC antenna
Antenna Specification	SRD: Antenna Gain : -2.00 dBi (Numeric gain: 0.63)
Maximum tune up power	SRD: 19.00 dBm (79.433 mW)
Power Supply:	Battery:3.6V
Sample Received Date:	Nov. 12, 2019
Sample tested Date:	Nov. 12, 2019 to Apr. 26, 2020
The tested sample(s) and the sample information are provided by the client.	

4.4 Test Location

All tests were performed at:
Centre Testing International Group Co., Ltd
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385
No tests were sub-contracted.
FCC Designation No.: CN1164

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

5.2 Maximum Permissible Exposure

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

SRD:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
8	905.3	79.433	0.63	20	0.0100	1

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32L00335501 for EUT external and internal photos.

*** End of Report ***