

# RF EXPOSURE EVALUATION REPORT

**Product Name:** Smart Plug  
**Trade Mark:** N/A  
**Model No.:** 3RSP019BZ  
**Add. Model No.:** N/A  
**Report Number:** 210524026RFC-3  
**Test Standards:** FCC 47 CFR Part 1 Subpart I  
 RSS-102 Issue 5  
**FCC ID:** 2AOCT-3RSP019BZ  
**Test Result:** PASS  
**Date of Issue:** July 3, 2021

Prepared for:

**Third Reality, Inc.**

**NO.9 Nanxu Road,RunZhou District,Zhenjiang,Jiangsu,China**

Prepared by:

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**  
**Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China**

**TEL: +86-755-2823 0888**

**FAX: +86-755-2823 0886**

Prepared by:

*Kieron Luo*

Kieron Luo

Project Engineer

Reviewed by:

*Eric Yu*

Eric Yu

Project Supervisor

Approved by:

*Kevin Liang*

Assistant Manager

Date:

July 3, 2021



**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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**Version**

Version No.	Date	Description
V1.0	July 3, 2021	Original

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## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

<b>Applicant:</b>	Third Reality, Inc.
<b>Address of Applicant:</b>	NO.9 Nanxu Road, RunZhou District, Zhenjiang, Jiangsu, China
<b>Manufacturer:</b>	Third Reality, Inc.
<b>Address of Manufacturer:</b>	NO.9 Nanxu Road, RunZhou District, Zhenjiang, Jiangsu, China

### 1.2 EUT INFORMATION

<b>Product Name:</b>	Smart Plug	
<b>Model No. / HVIN:</b>	3RSP019BZ	
<b>Add. Model No. / HVIN:</b>	N/A	
<b>Trade Mark:</b>	N/A	
<b>DUT Stage:</b>	Production Unit	
<b>EUT Supports Function:</b>	2.4 GHz ISM Band:	Bluetooth V4.0
		Zigbee
<b>Software Version:</b>	V1.00.02	
<b>Hardware Version:</b>	REV0.2	
<b>Sample Received Date:</b>	May 24, 2021	
<b>Sample Tested Date:</b>	May 26, 2021 to June 4, 2021	

### 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

For BLE	
Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2402 MHz to 2480 MHz
Bluetooth Version:	Bluetooth LE
Type of Modulation:	GFSK
Number of Channels:	40
Channel Separation:	2 MHz
Antenna Type:	PCB Antenna
Antenna Gain:	2 dBi
Maximum Peak Power:	10.93 dBm

For Zigbee	
Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2405 MHz to 2480 MHz
Type of Modulation:	OQPSK
Number of Channels:	16
Channel Separation:	5 MHz
Antenna Type:	PCB Antenna
Antenna Gain:	2 dBi
Maximum Peak Power:	9.52 dBm

### 1.4 OTHER INFORMATION

Test channels for _LE				
Type of Modulation	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
GFSK	2402 MHz to 2480 MHz	Channel 0	Channel 19	Channel 39
		2402 MHz	2440 MHz	2480 MHz

Test channels for Zigbee				
Type of Modulation	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
OQPSK	2405 MHz to 2480 MHz	Channel 0	Channel 7	Channel 15
		2405 MHz	2440 MHz	2480 MHz

### 1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

**FCC 47 CFR Part 1 Subpart I**  
**RSS-102 Issue 5**

All test items have been performed and recorded as per the above standards

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## 1.6 TEST LOCATION

All tests were performed at:

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China, China 518109

Telephone: +86 (0) 755 2823 0888

Fax: +86 (0) 755 2823 0886

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## 1.7 TEST FACILITY

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

**CNAS-Lab Code: L9069**

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturers recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

**A2LA-Lab Certificate No.: 4312.01**

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**ISED Wireless Device Testing Laboratories**

CAB identifier: CN0032

**FCC Accredited Lab.**

Designation Number: CN1194

Test Firm Registration Number: 259480

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## 1.8 DEVIATION FROM STANDARDS

None.

## 1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

## 2. EQUIPMENT LIST

Please refer to the RF test report.

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### 3. MPE EVALUATION

#### 3.1 REFERENCE DOCUMENTS FOR EVALUATION

No.	Identity	Document Title
1	FCC 47 CFR Part 1 Subpart I	PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
2	RSS-102 Issue 5	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
3	KDB 447498 D01 General RF Exposure Guidance v06	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES

#### 3.2 MPE COMPLIANCE REQUIREMENT

##### 3.2.1 Limits

##### 3.2.1.1 FCC 47 CFR Part 1 Subpart I

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

##### Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

##### Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

**Note:** f = frequency in MHz; \* = Plane-wave equivalent power density.

##### 3.2.1.2 RSS-102 Issue 5

According to RSS-102 Issue 5, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

According to RSS-102 Issue 5, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

#### Shenzhen UnionTrust Quality and Technology Co., Ltd.

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- below 20 MHz<sup>6</sup> and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

### 3.2.2 Test Procedure

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

### 3.3 MPE CALCULATION METHOD

$$S = PG/4\pi R^2 = EIRP/4\pi R^2$$

S = power density (in appropriate units, e.g., mw/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

### 3.4 MPE CALCULATION RESULTS

*Note: For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.*

#### 3.4.1 For BT and Zigbee

For BT\_LE function, operating at 2402MHz to 2480 MHz for GFSK and

For Zigbee function, operating at 2405MHz to 2480 MHz for OQPSK.

#### 3.4.2.1 Antenna Type:

Chain 0: PCB Antenna

#### 3.4.2.2 Antenna Gain:

Chain 0:

For BLE 2402MHz to 2480 MHz: 2 dBi

For Zigbee 2405MHz to 2480MHz :2dBi



**3.4.2.3 Results for Results for FCC 47 CFR Part 1 Subpart I**

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(mW)	(mw/cm <sup>2</sup> )	
LE	2402	10	1	2	13	19.9526	1	0.0040
	2440	10	1	2	13	19.9526	1	0.0040
	2480	10	1	2	13	19.9526	1	0.0040
Zigbee	2405	9	1	2	12	15.8489	1	0.0032
	2440	9	1	2	12	15.8489	1	0.0032
	2480	9	1	2	12	15.8489	1	0.0032

**3.4.2.4 Results for RSS-102 Issue 5**

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Limit
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(W)	(W)
LE	2402	10	1	2	13	0.0200	2.6764
	2440	10	1	2	13	0.0200	2.7053
	2480	10	1	2	13	0.0200	2.7355
Zigbee	2405	9	1	2	12	0.018	2.6787
	2440	9	1	2	12	0.0158	2.7053
	2480	9	1	2	12	0.0158	2.7355

**3.4.2 Simultaneous Multi-band Transmission MPE Analysis**

**List of Mode for Simultaneous Multi-band Transmission**

No.	Configurations	Support/Not Support
1	Zigbee + BLE	Not Support

## APPENDIX 1 PHOTOS OF TEST SETUP

N/A

## APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

\*\*\* End of Report \*\*\*

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