

# FCC RF EXPOSURE EVALUATION REPORT

**Product Name:** Bridge 4G  
**Trade Mark:** N/A  
**Model No.:** BG2350—00—0000  
**Report Number:** 210323034RFC-2  
**Test Standards:** FCC 47 CFR Part 1 Subpart I  
**FCC ID:** 2AZIM-BRIDGE4G  
**Test Result:** PASS  
**Date of Issue:** September 30, 2021

Prepared for:

**Defendec Ltd**  
**Erika 14, C-entrance, 10416 Tallinn, Harjumaa, Estonia**

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: Gavin Xu

Gavin Xu  
Project Engineer

Reviewed by: Henry Lu

Henry Lu  
Team Leader

Approved by: Kevin Liang



Kevin Liang  
Assistant Manager

Date: September 30, 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>

UTTR-RF-FCCPART1-V1.0

**Version**

Version No.	Date	Description
V1.0	September 30, 2021	Original



## CONTENTS

<b>1. GENERAL INFORMATION</b> .....	<b>4</b>
<b>1.1 CLIENT INFORMATION</b> .....	<b>4</b>
<b>1.2 EUT INFORMATION</b> .....	<b>4</b>
<b>1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD</b> .....	<b>4</b>
<b>1.4 OTHER INFORMATION</b> .....	<b>5</b>
<b>1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS</b> .....	<b>8</b>
<b>1.6 TEST LOCATION</b> .....	<b>8</b>
<b>1.7 TEST FACILITY</b> .....	<b>8</b>
<b>1.8 DEVIATION FROM STANDARDS</b> .....	<b>8</b>
<b>1.9 ABNORMALITIES FROM STANDARD CONDITIONS</b> .....	<b>8</b>
<b>1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER</b> .....	<b>9</b>
<b>2. EQUIPMENT LIST</b> .....	<b>10</b>
<b>3. MPE EVALUATION</b> .....	<b>11</b>
<b>3.1 REFERENCE DOCUMENTS FOR EVALUATION</b> .....	<b>11</b>
<b>3.2 MPE COMPLIANCE REQUIREMENT</b> .....	<b>11</b>
3.2.1 LIMITS.....	11
3.2.2 TEST PROCEDURE .....	11
<b>3.3 MPE CALCULATION METHOD</b> .....	<b>11</b>
<b>3.4 MPE CALCULATION RESULTS</b> .....	<b>11</b>
3.4.1 FOR 2.4GHZ .....	12
3.4.2 FOR WCDMA .....	12
3.4.3 FOR LTE .....	13
3.4.4 SIMULTANEOUS MULTI-BAND TRANSMISSION MPE ANALYSIS.....	13
<b>APPENDIX 1 PHOTOS OF TEST SETUP</b> .....	<b>15</b>
<b>APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS</b> .....	<b>15</b>

## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

<b>Applicant:</b>	Defendec Ltd
<b>Address of Applicant:</b>	Erika 14, C-entrance, 10416 Tallinn, Harjumaa, Estonia
<b>Manufacturer:</b>	Defendec Ltd
<b>Address of Manufacturer:</b>	Erika 14, C-entrance, 10416 Tallinn, Harjumaa, Estonia

### 1.2 EUT INFORMATION

<b>Product Name:</b>	Bridge 4G	
<b>Model No.:</b>	BG2350—00—0000	
<b>Add. Model No.:</b>	N/A	
<b>Trade Mark:</b>	N/A	
<b>DUT Stage:</b>	Identical Prototype	
<b>EUT Supports Function:</b>	UTRA Bands:	Band II/ Band IV/ Band V
	E-UTRA Bands:	FDD Band 2/ Band 4/ Band 5/ Band 12/ Band 13/ Band 14/ Band 66/ Band 71
	2.4 GHz ISM Band:	2460MHz
<b>Software Version:</b>	7.6.0	
<b>Hardware Version:</b>	Bridge 4G	
<b>Sample Received Date:</b>	March 23, 2021	
<b>Sample Tested Date:</b>	March 29, 2021 to April 2, 2021	

### 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

For 2.4GHz	
<b>Frequency Band:</b>	2400 MHz to 2483.5 MHz
<b>Type of Modulation:</b>	GFSK
<b>Number of Channels:</b>	1
<b>Channel Separation:</b>	2 MHz
<b>Antenna Type:</b>	External Antenna
<b>Antenna Gain:</b>	4 dBi
<b>Maximum Peak Power:</b>	-35.97 dBm
<b>Normal Test Voltage:</b>	3.7 Vdc

For WCDMA		
<b>Support Networks:</b>	WCDMA, HSDPA, HSUPA	
<b>Type of Modulation:</b>	WCDMA	BPSK
	HSDPA/DC-HSDPA:	QPSK
	HSUPA:	QPSK
	WCDMA Band II:	1852.4-1907.6 MHz
	WCDMA Band IV:	1712.4-1752.6 MHz
	WCDMA Band V:	826.4-846.6 MHz
<b>Max RF Output Power:</b>	WCDMA Band II:	29.13dBm
	WCDMA Band IV:	29.53dBm
	WCDMA Band V:	26.65dBm

#### 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>

UTTR-RF-FCCPART1-V1.0

<b>Emission Designator:</b>	WCDMA Band II:	4M14F9W
	WCDMA Band IV:	4M14F9W
	WCDMA Band V:	4M15F9W
<b>Antenna Type:</b>	Integral Antenna	
<b>Antenna Gain:</b>	WCDMA Band II:	4.5 dBi
	WCDMA Band IV:	4.5 dBi
	WCDMA Band V:	1.5 dBi
<b>Normal Test Voltage:</b>	3.7 Vdc	

For LTE		
<b>Support Networks:</b>	LTE	
<b>Type of Modulation:</b>	LTE Band 2/4/5/12/13/14/66/71:	QPSK, 16QAM
<b>Max RF Output Power:</b>	LTE Band 2:	28.85dBm
	LTE Band 4:	29.12 dBm
	LTE Band 5:	25.97dBm
	LTE Band 12:	25.63dBm
	LTE Band 13:	26.19dBm
	LTE Band 14:	25.86dBm
	LTE Band 66:	29.06dBm
	LTE Band 71:	25.18dBm
<b>Antenna Type:</b>	Integral Antenna	
<b>Antenna Gain:</b>	LTE Band 2:	4.5 dBi
	LTE Band 4:	4.5 dBi
	LTE Band 5:	1.5 dBi
	LTE Band 12:	1.5 dBi
	LTE Band 13:	1.5 dBi
	LTE Band 14:	1.5 dBi
	LTE Band 66:	4.5 dBi
	LTE Band 71:	1.5 dBi
<b>Normal Test Voltage:</b>	3.7 Vdc	

### 1.4 OTHER INFORMATION

For 2.4GHz

Type of Modulation	Tx/Rx Frequency
GFSK	2460 MHz

For WCDMA

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
WCDMA band V	Tx (824 MHz ~ 849 MHz)	Channel 4132	Channel 4182	Channel 4233
		826.4 MHz	836.4 MHz	846.6 MHz

### 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>

UTTR-RF-FCCPART1-V1.0

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
WCDMA Band II	Tx (1850 MHz-1910 MHz)	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
WCDMA Band IV	Tx (1710 MHz-1755 MHz)	Channel 1312	Channel 1412	Channel 1513
		1712.4 MHz	1732.4 MHz	1752.6 MHz

**For LTE**

Band	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink (MHz)	
LTE Band 2 TX: 1850-1910MHz	Low Range	1.4	18607	1850.7	
		3	18615	1851.5	
		5	18625	1852.5	
		10	18650	1855	
		15	18675	1857.5	
		20	18700	1860	
	Middle Range	1.4/3/5/10/15/20	18900	1880	
	High Range	1.4	19193	1909.3	
		3	19185	1908.5	
		5	19175	1907.5	
		10	19150	1905	
		15	19125	1902.5	
		20	19100	1900	
	LTE Band 4 TX: 1710-1755MHz	Low Range	1.4	19957	1710.7
			3	19965	1711.5
5			19975	1712.5	
10			20000	1715	
15			20025	1717.5	
20			20050	1720	
Middle Range		1.4/3/5/10/ 15/20	20175	1732.5	
High Range		1.4	20393	1754.3	
		3	20385	1753.5	
		5	20375	1752.5	
		10	20350	1750	
		15	20325	1747.5	
		20	20300	1745	
LTE band 5 TX: 824-849MHz		Low Range	1.4	20407	824.7
			3	20415	825.5
	5		20425	826.5	
	10		20450	829	
	Middle Range	1.4/3/5/10	20525	836.5	
	High Range	1.4	20643	848.3	
		3	20635	847.5	

**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>

UTTR-RF-FCCPART1-V1.0

		5	20625	846.5
		10	20600	844
LTE Band 12 TX: 699-716MHz	Low Range	1.4	23017	699.7
		3	23025	700.5
		5	23035	701.5
		10	23060	704
		1.4/3/5/10	23095	707.5
	High Range	1.4	23173	715.3
		3	23165	714.5
		5	23155	713.5
		10	23130	711
LTE Band 13 TX: 777-787MHz	Low Range	5	23205	779.5
		10	23230	782
	Middle Range	5/10	23230	782
	High Range	5	23255	784.5
		10	23230	782
LTE Band 14 TX: 788-798MHz	Low Range	5	23305	790.5
		10	23330	793
	Middle Range	5/10	23330	793
	High Range	5	23355	795.5
		10	23330	793
LTE Band 66 TX: 1710-1780MHz	Low Range	1.4	131979	1710.7
		3	131987	1711.5
		5	131997	1712.5
		10	132022	1715
		15	132047	1717.5
		20	132072	1720
	Middle Range	1.4/3/5/10/ 15/20	132322	1745
	High Range	1.4	132665	1779.3
		3	132657	1778.5
		5	132647	1777.5
		10	132622	1775
		15	132597	1772.5
		20	132572	1770
LTE Band 71 TX: 663-698MHz	Low Range	5	133147	665.5
		10	133172	668
		15	133197	670.5
		20	133222	673
	Middle Range	5/10/15	133297	680.5
		20	133322	683
	High Range	5	133447	695.5
		10	133422	693
		15	133397	690.5
		20	133372	688

**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>

UTTR-RF-FCCPART1-V1.0

## 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**

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

---

---

## 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 518109

Telephone: +86 (0) 755 2823 0888

Fax: +86 (0) 755 2823 0886

---

---

## 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 manufacturer's 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

---

---

## 1.8 DEVIATION FROM STANDARDS

None.

## 1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

### **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>

UTTR-RF-FCCPART1-V1.0



**1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER**

None.



## 2. EQUIPMENT LIST

Please refer to the RF test report.



### 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	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

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)	P \?	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.

##### 3.2.2 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.

#### 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>

UTTR-RF-FCCPART1-V1.0

**3.4.1 For 2.4GHz**

For 2.4GHz, operating at 2460MHz

**3.4.1.1 Antenna Type:**

External Antenna

**3.4.1.2 Antenna Gain:**

2460MHz: 4 dBi

**3.4.1.3 Results for 2.4GHz**

Freq.	Maximum conducted output power	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Separation Distance	MPE Limit	MPE Value
(MHz)	(dBm)	(dBi)	(dBm)	(mW)	(cm)	(mw/cm <sup>2</sup> )	
2460	-35.97	4	-31.97	0.0006353309	20	1	0.0000001264

**3.4.2 For WCDMA**

For WCDMA Band II, operating at 1852.4-1907.6 MHz

For WCDMA Band IV, operating at 1712.4-1752.6 MHz

For WCDMA Band V, operating at 826.4-846.6 MHz

**3.4.2.1 Antenna Type:**

Integral Antenna

**3.4.2.2 Antenna Gain:**

WCDMA Band II&IV: 4.5dBi

WCDMA Band V: 1.5dBi

**3.4.2.3 Results for WCDMA**

Operating Mode	Maximum conducted output power (per tune-up)	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Separation Distance	MPE Limit	MPE Value
	(dBm)	(dBi)	(dBm)	(mW)	(cm)	(mw/cm <sup>2</sup> )	
Band II	25.00	4.5	29.5	891.2509	20	1	0.1773
Band IV	25.00	4.5	29.5	891.2509	20	1	0.1773
Band V	25.00	1.5	26.5	446.6836	20	0.558	0.0889

### 3.4.3 For LTE

For LTE Band 2, operating at 1850~1910 MHz  
 For LTE Band 4, operating at 1710~1755 MHz  
 For LTE Band 5, operating at 824~849 MHz  
 For LTE Band 12, operating at 699~716 MHz  
 For LTE Band 13, operating at 777~787 MHz  
 For LTE Band 14, operating at 788~798 MHz  
 For LTE Band 66, operating at 1710~1780 MHz  
 For LTE Band 71, operating at 663~698 MHz

#### 3.4.2.4 Antenna Type:

Integral Antenna

#### 3.4.2.5 Antenna Gain:

LTE Band 2&4&66: 4.5dBi  
 LTE Band 5&12&13&14&71: 1.5dBi

#### 3.4.2.6 Results for LTE

Operating Mode	Maximum conducted output power (per tune-up)	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Separation Distance	MPE Limit	MPE Value
	(dBm)	(dBi)	(dBm)	(mW)	(cm)	(mw/cm <sup>2</sup> )	
Band 2	25.00	4.5	29.5	891.2509	20	1	0.1773
Band 4	25.00	4.5	29.5	891.2509	20	1	0.1773
Band 5	25.00	1.5	26.5	446.6836	20	0.558	0.0889
Band 12	25.00	1.5	26.5	446.6836	20	0.472	0.0889
Band 13	25.00	1.5	26.5	446.6836	20	0.521	0.0889
Band 14	25.00	1.5	26.5	446.6836	20	0.529	0.0889
Band 66	25.00	4.5	29.5	891.2509	20	1	0.1773
Band 71	25.00	1.5	26.5	446.6836	20	0.454	0.0889

### 3.4.4 Simultaneous Multi-band Transmission MPE Analysis

#### 3.4.4.1 List of Mode for Simultaneous Multi-band Transmission

No.	Configurations	Support/Not Support
1	2.4G + WCDMA	Support
2	2.4G + LTE	Support

**3.4.4.2 Results for transmit simultaneously**

No.	Configurations	Maximum MPE Value (mw/cm <sup>2</sup> )			Limits (mw/cm <sup>2</sup> )
		2.4G	WCDMA/LTE	Transmit simultaneously	
1	2.4G + WCDMA	0.0000001264	0.1773	0.1773	1
2	2.4G + LTE	0.0000001264	0.1773	0.1773	1

**Note 1:** According to KDB 447498 D01 General RF Exposure Guidance v06, At the transmit simultaneously calculation method is as follows:

*Transmit simultaneously MPE =  $\Sigma$  of MPE ratios*

*MPE ratios = Field strengths or power density / MPE limit at the test frequency*

## 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 \*\*\*

---

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.

---