

# RF Exposure Evaluation Report

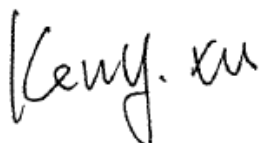
**Application No.:** SZEM2011012030CR  
**Applicant:** UAB Teltonika Networks  
**Address of Applicant:** K. Barsausko st. 66, LT-51436, Kaunas, Lithuania  
**Manufacturer:** UAB Teltonika Networks  
**Address of Manufacturer:** K. Barsausko st. 66, LT-51436, Kaunas, Lithuania  
**Factory:** UAB Teltonika EMS  
**Address of Factory:** Liepkalnio st. 132A, LT-02121, Vilnius, Lithuania

**Equipment Under Test (EUT):**  
**Product Name:** LTE Router  
**Model No.:** RUT240  
**Trade Mark:** Teltonika  
**FCC ID:** 2AET4RUT240G  
**Standards:** 47 CFR Part 1.1307  
 47 CFR Part 1.1310  
 47 CFR Part 2.1091

**Date of Receipt:** 2020-11-25  
**Date of Test:** 2021-05-10 to 2021-05-22  
**Date of Issue:** 2021-05-26

<b>Test Result :</b>	<b>PASS*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.




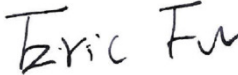
Keny Xu  
 EMC Laboratory Manager



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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-05-26		Original

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



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## 4 General Information

### 4.1 General Description of EUT

Power Supply:	DC9V by AC/DC Adapter Adapter M/N: SJ-09010033 Adapter input: 100-240VAC, 50/60Hz, 0.8A Adapter output: DC9V/1A
Cable:	Power cable: 2m unshielded without ferrite core RJ45 cable: 1.5m unshielded
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11
Channel Spacing:	5MHz
Antenna Type:	Dipole antenna
Antenna Gain:	5dBi



## 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:

- **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 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

**TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

#### 5.1.2 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 Evaluation

**For 2.4G WIFI:**

Antenna Gain: 5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.16 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
Middle	2437	15.42	34.83	0.0219	1.0	PASS

Note: Refer to report No. SZEM201101203002 for EUT test Max Conducted Peak Output Power value. The distance r (4th column) calculated from the Friis transmission formula is far greater than 20 cm separation requirement, the MPE limit of 1500MHz to 100000MHz is 1.0 mW/cm<sup>2</sup>.

**For WCDMA/LTE module:**

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

Type	Test Freq. (MHz)	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R=20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
WCDMA Band II	1852.4	3	2.00	25	316.23	0.0201	1	0.0201	PASS
WCDMA Band IV	1712.4	3	2.00	25	316.23	0.0201	1	0.0201	PASS
WCDMA Band V	826.4	3	2.00	25	316.23	0.0201	0.5509	0.0365	PASS
LTE Band2	1850.7	3	2.00	25	316.23	0.0201	1	0.0201	PASS
LTE Band4	1710.7	3	2.00	25	316.23	0.0201	1	0.0201	PASS
LTE Band5	824.7	3	2.00	25	316.23	0.0201	0.5498	0.0365	PASS
LTE Band12	699.7	3	2.00	25	316.23	0.0201	0.4665	0.0431	PASS
LTE Band13	779.5	3	2.00	25	316.23	0.0201	0.5197	0.0386	PASS
LTE Band14	790.5	3	2.00	25	316.23	0.0201	0.5270	0.0381	PASS
LTE Band66	1710.7	3	2.00	25	316.23	0.0201	1.0000	0.0201	PASS
LTE Band71	665.5	3	2.00	25	316.23	0.0201	0.4437	<b>0.0453</b>	PASS

Note: LTE module EC25-AF has been authorized under FCC ID: XMR201808EC25AF dated on 08/03/2018.



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Note: Refer to report No. R1806A0301 or EUT test Max Conducted Peak Output Power value.  
The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement. the MPE limit of 300MHz to 1500MHz is  $f/1500 \text{ mW/cm}^2$ , the MPE limit of 1500MHz to 100000MHz is  $1.0 \text{ mW/cm}^2$ .

The simultaneous transmission result between of WLAN and WCDMA/LTE module:

The SAR Exclusion Threshold Level:

$$= \text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2}$$

(CPD = Calculation power density, LPD = Limit of power density)

$$= (0.0219/1) + (0.0201/0.4437) = 0.0672 < 1$$

Since the SAR Exclusion Threshold Level is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

- End of the Report -

