

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 General Information

### Client Information

Applicant: Streamax Technology Co., Ltd.  
Address of applicant: 21-23/F, Building B1, Zhiyuan, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong , P.R. China

Manufacturer: Streamax Technology Co., Ltd.  
Address of manufacturer: 21-23/F, Building B1, Zhiyuan, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong , P.R. China

### General Description of EUT:

Product Name: 4G Router  
Trade Name: /  
Model No.: 4G Router  
Adding Model(s): /  
FCC ID: 2AM6L-4GROUTER  
Rated Voltage: DC 5V

### Technical Characteristics of EUT:

Support Networks: FDD-LTE  
Support Band: FDD-LTE Band 2, 4, 5, 13, 17, 25  
FDD-LTE Band 2: Tx: 1850-1910MHz,  
FDD-LTE Band 4: Tx: 1710-1755MHz,  
FDD-LTE Band 5: Tx: 824-849MHz,  
FDD-LTE Band 13: Tx: 777-787MHz,  
FDD-LTE Band 17: Tx: 704-716MHz,  
FDD-LTE Band 25: Tx: 1850-1915MHz  
FDD-LTE Band 2: Rx: 1930-1990MHz,  
FDD-LTE Band 4: Rx: 2110-2155MHz,  
FDD-LTE Band 5: Rx: 869-894MHz,  
FDD-LTE Band 13: Rx: 745-756MHz,  
FDD-LTE Band 17: Rx: 734-746MHz,  
FDD-LTE Band 25: Rx: 1930-1995MHz  
FDD-LTE Band 2: 23.38dBm,  
FDD-LTE Band 4: 23.83dBm,  
FDD-LTE Band 5: 23.23dBm,  
FDD-LTE Band 13: 23.92dBm,  
FDD-LTE Band 17: 23.61dBm  
FDD-LTE Band 25: 23.81dBm  
RF Output Power:  
Type of Emission: FDD-LTE Band 2: 17M9G7D, 17M9W7D

FDD-LTE Band 4: 17M8G7D, 17M9W7D  
FDD-LTE Band 5: 8M94G7D, 8M93W7D  
FDD-LTE Band 13: 8M89G7D, 8M88W7D  
FDD-LTE Band 17: 8M91G7D, 8M91W7D  
FDD-LTE Band 25: 17M8G7D, 17M8W7D

Type of Modulation: QPSK, 16QAM

Antenna Type: External SMA-revers Antenna

Antenna Gain: FDD-LTE Band 2: 3dBi,  
FDD-LTE Band 4: 3dBi,  
FDD-LTE Band 5: 3dBi,  
FDD-LTE Band 13: 3dBi,  
FDD-LTE Band 17: 3dBi,  
FDD-LTE Band 25: 3dBi,

Device Category: Fixed Device

*Note 1: The EUT Main board support LTE Band 2/4/5/13/17/25 function. It is intended for Provide wireless long distance data transmission function, realize data transparent transmission and routing function. For more information see the following datasheet*

## 1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, 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.

(a) 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

(b) 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

### 1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

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)

## 1.4 MPE Calculation Result

For LET B2:

Maximum Tune-up output power: 23.5 (dBm)

Maximum peak output power at antenna input terminal: 223.87 (mW)

Prediction distance: >20(cm)

Prediction frequency: 1909.3 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.09(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

For LTE B4:

Maximum Tune-up output power: 24 (dBm)

Maximum peak output power at antenna input terminal: 251.19 (mW)

Prediction distance: >20(cm)

Prediction frequency: 1732.5 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.10(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

For LTE B5:

Maximum Tune-up output power: 23.5 (dBm)

Maximum peak output power at antenna input terminal: 223.87 (mW)

Prediction distance: >20(cm)

Prediction frequency: 836.5 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.09(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 0.56 (mw/cm<sup>2</sup>)

For LTE B13:

Maximum Tune-up output power: 24 (dBm)

Maximum peak output power at antenna input terminal: 251.19 (mW)

Prediction distance: >20(cm)

Prediction frequency: 782 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.10(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 0.52 (mw/cm<sup>2</sup>)

For LTE B17:

Maximum Tune-up output power: 24 (dBm)

Maximum peak output power at antenna input terminal: 251.19 (mW)

Prediction distance: >20(cm)

Prediction frequency: 709 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.10(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 0.47 (mw/cm<sup>2</sup>)

For LTE B25:

Maximum Tune-up output power: 24 (dBm)

Maximum peak output power at antenna input terminal: 251.19 (mW)

Prediction distance: >20(cm)

Prediction frequency: 1882.5 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.0

The worst case is power density at prediction frequency at 20cm: 0.10(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

All bands cannot transmit at the same time.

Result: Pass

## 1.5 Test Setup Photos

