1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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
Uplink Frequency:	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
Downlink Frequency:	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
RF Output Power:	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
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
	FDD-LTE Band 2: 3dBi,
	FDD-LTE Band 4: 3dBi,
	FDD-LTE Band 5: 3dBi,
Antenna Gain:	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^2)	Averaging Times $\lvert E \rvert^2$, $\lvert H \rvert^2$ 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^2)	Averaging Times $\mid E \mid^2$, $\mid H \mid^2$ 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 equivalents power density

1.3 MPE Calculation Method

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

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

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: <u>23.5 (dBm)</u>

Maximum peak output power at antenna input terminal: <u>223.87 (mW)</u>

Prediction distance: <u>>20(cm)</u>

Prediction frequency: <u>1909.3 (MHz)</u>

Antenna gain: <u>3 (dBi)</u>

Directional gain (numeric gain): <u>2.0</u>

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

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

For LTE B4:

Maximum Tune-up output power: <u>24 (dBm)</u>

Maximum peak output power at antenna input terminal: <u>251.19 (mW)</u>

Prediction distance: <u>>20(cm)</u>

Prediction frequency: <u>1732.5 (MHz)</u>

Antenna gain: <u>3 (dBi)</u>

Directional gain (numeric gain): <u>2.0</u>

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

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

For LTE B5:

Maximum Tune-up output power: <u>23.5 (dBm)</u>

Maximum peak output power at antenna input terminal: <u>223.87 (mW)</u>

Prediction distance: <u>>20(cm)</u>

Prediction frequency: <u>836.5 (MHz)</u>

Antenna gain: <u>3 (dBi)</u>

Directional gain (numeric gain): <u>2.0</u>

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

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

For LTE B13:

Maximum Tune-up output power: <u>24 (dBm)</u>

Maximum peak output power at antenna input terminal: <u>251.19 (mW)</u>

Prediction distance: <u>>20(cm)</u>

Prediction frequency: <u>782 (MHz)</u>

Antenna gain: <u>3 (dBi)</u>

Directional gain (numeric gain): <u>2.0</u>

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

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

For LTE B17:

Maximum Tune-up output power: <u>24 (dBm)</u>

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^2)

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

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^2)

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

All bands cannot transmit at the same time.

Result: Pass

1.5 Test Setup Photos