

RF EXPOSURE REPORT

FOR

Applicant	:	StreamUnlimited Engineering GmbH
Address	:	Gutheil Schoder Gasse 10, A1100 Vienna, Austria
Equipment under Test	:	Bluetooth/BLE/WIFI/ module "STREAM1832"
Model No.	:	STREAM1832
FCC ID	:	2AJYB-S1832
Trade Mark	:	N/A
Manufacturer	:	StreamUnlimited Engineering GmbH
Address	:	Gutheil Schoder Gasse 10, A1100 Vienna, Austria

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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Test Report Declare

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Standard Used: KDB447498 D01 General RF Exposure Guidance v06

We Declare:

The equipment described above is assessed by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration assessed the equipment complied with the standards specified above. The assessed results are contained in this report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these assess.

After evaluation, our opinion is that the equipment In Accordance with above standard.

Report No.:	DDT-RE23071814-2E21		
Date of Receipt:	May 09, 2018	Date of Test:	May 09, 2018 ~ May 11, 2018

Prepared By:

Jacky Huang

Jacky Huang/Engineer

Approved By:

Damon Hu

Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Aug. 25, 2023	

1. General Information

1.1. Description of equipment

EUT Name	: Bluetooth/BLE/WIFI/ module "STREAM1832"
Model Number	: STREAM1832
EUT function description	: Please reference user manual of this device
Power Supply	: DC 12V
Radio Specification	: Bluetooth V5.0, IEEE802.11b/g/n/a/ac
Operation frequency	: Bluetooth: 2402MHz-2480MHz IEEE802.11b/g/n/a/ac: 2412MHz-2472MHz, 5180MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz
Modulation	: Bluetooth: GFSK, $\pi/4$ -DQPSK, 8DPSK IEEE 802.11b: DSSS (CCK, QPSK, BPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: VHT20, VHT40, VHT80: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Transmitter rate	: Bluetooth: 1Mbps, 2Mbps, 3Mbps IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: up to 72.2 Mbps IEEE 802.11n HT40: up to 300 Mbps IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: up to 72.2 Mbps IEEE 802.11n HT40: up to 150 Mbps IEEE 802.11ac VHT20: up to 86.7 Mbps IEEE 802.11ac VHT40: up to 200 Mbps IEEE 802.11ac VHT80: up to 433.3 Mbps
Antenna	: FPC antenna, maximum PK gain: 2.85 dBi at 2.4G band, 3.99 dBi at 5G band for model: GPE 2107-1801+0/MGear C4207-810021-A(SSR-220258), FPC antenna, maximum PK gain: 2.67 dBi at 2.4G band, 3.80 dBi at 5G band for model: GPE 2107-1811+0/MGear C4207-810020-A(SSR-220257)

Note: This report adds two different model antennas on the basis of the original certification, relative test result please refer to the original report: INE-AT/FG-18/153, INE-AT/FG-18/154, INE-AT/FG-18/155 and INE-AT/FG-18/156.

2.4G Band:

Antenna information		
Test mode	GPE 2107-1801+0/MGear C4207-810021-A(SSR-220258) (dBi)	GPE 2107-1811+0/MGear C4207-810020-A(SSR-220257) (dBi)
GFSK	2.85	2.67
$\pi/4$ -DQPSK	2.85	2.67
8DPSK	2.85	2.67
IEEE 802.11b	2.85	2.67
IEEE 802.11g	2.85	2.67
IEEE 802.11n HT20	2.85	2.67
IEEE 802.11n HT40	2.85	2.67

5G Band:

Antenna information			
Test mode	Frequency band (MHz)	GPE 2107-1801+0/MGear C4207-810021-A(SSR-220258) (dBi)	GPE 2107-1811+0/MGear C4207-810020-A(SSR-220257) (dBi)
IEEE 802.11a	5150-5250	2.77	2.04
	5250-5350	2.68	1.44
	5470-5725	3.99	3.80
	5725-5850	2.25	2.20
IEEE 802.11n HT20	5150-5250	2.77	2.04
	5250-5350	2.68	1.44
	5470-5725	3.99	3.80
	5725-5850	2.25	2.20
IEEE 802.11n HT40	5150-5250	2.77	2.04
	5250-5350	2.68	1.44
	5470-5725	3.99	3.80
	5725-5850	2.25	2.20
IEEE 802.11ac VHT20	5150-5250	2.77	2.04
	5250-5350	2.68	1.44
	5470-5725	3.99	3.80
	5725-5850	2.25	2.20
IEEE 802.11ac VHT40	5150-5250	2.77	2.04
	5250-5350	2.68	1.44
	5470-5725	3.99	3.80
	5725-5850	2.25	2.20
IEEE 802.11ac VHT80	5150-5250	2.77	2.04
	5250-5350	2.68	1.44
	5470-5725	3.99	3.80
	5725-5850	2.25	2.20

1.2. Assess laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2. RF Exposure Evaluation

2.1. Requirement

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

Limits for General Population/Uncontrolled Exposure

(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 Time E ² , H 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
1500-100,000			1.0	30

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

2.2. Calculation method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)=

d = Separation distance between radiator and human body (m)

The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance, d= 0.2 m, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. Estimation result

Mode	PK Output power (mW)	PK Output power (dBm)	tune up power (dBm)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE Values (mW/cm ²)	MPE Limit (mW/cm ²)
BT	12.59	11.00	12.5	2.85	1.93	0.00483	1
BLE	13.49	11.30	12.8	2.85	1.93	0.00518	1
2.4G WIFI	43.65	16.40	17.9	2.85	1.93	0.01667	1
5G WIFI	28.84	14.60	16.1	3.99	2.51	0.01440	1

Simultaneous (Worst Case):

Bluetooth+2.4G WIFI=0.00518/1+0.01667/1=0.02185<1

Bluetooth+5G WIFI=0.00518/1+0.01440/1=0.01958<1

Note 1: The test data was cited from the original test report: INE-AT/FG-18/153, INE-AT/FG-18/154, INE-AT/FG-18/155 and INE-AT/FG-18/156.

Note 2: The evaluation is based on the worst gain values of the two antennas.

Note 3: The estimation distance is 20 cm.

Note 4: The EUT does not support simultaneous transmit with 2.4G WIFI and 5G WIFI.

Conclusion: The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

END OF REPORT