FCC RF EXPOSURE REPORT

FCC ID: 2AJYB-S1955XE

Project No.	:	2311C048
Equipment	:	Network Audio Streaming Module
Brand Name	:	StreamUnlimited
Test Model	:	Stream1955xE
Series Model	:	N/A
Applicant	:	StreamUnlimited Engineering GmbH
Address	:	StreamUnlimited Engineering GmbH, Gutheil Schoder Gasse 10, Vienna A1100, Vienna
Manufacturer	:	StreamUnlimited Engineering GmbH
Address	:	StreamUnlimited Engineering GmbH, Gutheil Schoder Gasse 10, Vienna A1100, Vienna
Factory	:	StreamUnlimited Engineering GmbH
Address	:	StreamUnlimited Engineering GmbH, Gutheil Schoder Gasse 10, Vienna A1100, Vienna
Date of Receipt	:	Nov. 10, 2023
Date of Test	:	Nov. 15, 2023 ~ Jan. 09, 2024
Issued Date	:	Feb. 07, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG2023111057 for BT/LE/WIFI 6E, DG2023111060 for 2.4G/5G
Standard(s)	:	FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091 FCC Title 47 Part 2.1091

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-7-2311C048	R00	Original Report.	Feb. 07, 2024	Valid

1. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi r^2} = \frac{EIRP}{4\pi r^2}$$

where:
S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Table for Filed Antenna:
BT(EDR+LE):

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	StreamUnlimited	N/A	FPC	MHF4	3

Note: The antenna gain is provided by the manufacturer.

WLAN 2.4G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	StreamUnlimited	N/A	FPC	MHF4	3
2	StreamUnlimited	N/A	FPC	MHF4	3

Note:
1) This EUT supports CDD, and all antennas have the same gain, Directional gain = G_{ANT}+Array Gain.
For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=3.
For power spectral density measurements, N_{ANT}=2, N_{SS} = 1.
So the Directional gain=G_{ANT}+Array Gain=G_{ANT}+10log(N_{ANT}/ N_{SS})dBi=3+10log(2/1)dBi=6.01.
Then, the power spectral density limit is 8-(6.01-6)=7.99.
2) The antenna gain is provided by the manufacturer.

WLAN 5G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	StreamUnlimited	N/A	FPC	MHF4	4
2	StreamUnlimited	N/A	FPC	MHF4	4

Note:
1) This EUT supports CDD, and all antennas have the same gain, Directional gain = G_{ANT}+Array Gain.
For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=4.
For power spectral density measurements, N_{ANT}=2, N_{SS} = 1.
So the Directional gain=G_{ANT}+Array Gain=G_{ANT}+10log(N_{ANT}/ N_{SS})dBi=4+10log(2/1)dBi=7.01.
Then, the UNII-1, UNII-2A and UNII-2C power spectral density limit is 11-(7.01-6)=9.99, the UNII-3 power spectral density limit is 30-(7.01-6)=28.99.
2) The antenna gain is provided by the manufacturer.

WIFI 6E:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1		N/A	FPC	MHF4	5.5
2		N/A	FPC	MHF4	5.5

Note:

1) This EUT supports CDD, and all antennas have the same gain, Directional gain = G_{ANT}+Array Gain.
For power measurements, Array Gain=0dB ($N_{ANT} \leqslant 4$), so the Directional gain=5.5.
For power spectral density measurements, N_{ANT}=2, N_{SS} = 1.
So the Directional gain=G_{ANT}+Array Gain=G_{ANT}+10log(N_{ANT}/ N_{SS})dBi=5.5+10log(2/1)dBi=8.51.
2) The antenna gain is provided by the manufacturer.

Table for Antenna Configuration:

WLAN 2.4G:

Operating Mode / TX Mode	2TX
IEEE 802.11b	V(Ant. 1 + Ant. 2)
IEEE 802.11g	V(Ant. 1 + Ant. 2)
IEEE 802.11n(HT20)	V(Ant. 1 + Ant. 2)
IEEE 802.11ax(HE20)	V(Ant. 1 + Ant. 2)

WLAN 5G:

Operating Mode / TX Mode	2TX
IEEE 802.11a	V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT20)	V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT80)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)

WIFI 6E:

Operating Mode / TX Mode	2TX
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)

2. TEST RESULTS

BT EDR:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Max. Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
3	1.9953	9.1	8.1283	0.00323	1	Complies

BT LE:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Max. Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
3	1.9953	8.3	6.7608	0.00269	1	Complies

WLAN 2.4G:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
3	1.9953	23.19	208.4491	0.08278	1	Complies

WLAN 5G:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
4	2.5119	19.01	79.6159	0.03981	1	Complies

WIFI 6E:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
5.5	3.5481	13.78	23.8781	0.01686	1	Complies

For the max simultaneous transmission MPE:

Ratio		Total	Limit of Ratio	Test Result
BT EDR	WLAN 2.4G			
0.00323	0.08278	0.08601	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report