FCC RF EXPOSURE REPORT

FCC ID: VOB-P3430

Project No.	: 1903C230
Equipment	: SHIELD Android TV Game Console
Model Name	: P3430
Series Model	: N/A
Applicant	: NVIDIA Corporation
Address	: 2788 San Tomas Expressway Santa Clara, CA 95051, United States
According	: FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091

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Certificate #5123.02

REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Jun. 21, 2019

1. GENERAL SUMMARY

Equipment   :   SHIELD Android TV Game Console
Brand Name   :   NVIDIA
Test Model   :   P3430
Series Model   :   N/A
Applicant   :   NVIDIA Corporation
Manufacturer   :   NVIDIA Corporation
Address   :   2788 San Tomas Expressway Santa Clara, CA 95051, United States
Date of Test   :   May 06, 2019 ~ Jun. 12, 2019
Test Sample   :   Engineering Sample
Standards   :   FCC Title 47 Part 2.1091, OET Bulletin 65 Supplement C

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-6-1903C230) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

2. 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

For BT/LE:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	1.68

For 2.4G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	1.68
2	N/A	N/A	Internal	N/A	1.60

Note:

(1) This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain $=10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$dBi, that is Directional gain$=10\log[(10^{1.68/20}+10^{1.60/20})^2/2]$dBi $=4.65$.

(2) Both Ant. 1 and Ant. 2 had been tested and the test data of Ant. 2 were the worst case. b/g mode has only one antenna transmits, n mode can transmit two antennas at the same time.

For 5G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Internal	N/A	4.11	UNII-1
2	N/A	N/A	Internal	N/A	4.21	UNII-1

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Internal	N/A	4.38	UNII-2A
2	N/A	N/A	Internal	N/A	4.05	UNII-2A

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Internal	N/A	4.07	UNII-2C
2	N/A	N/A	Internal	N/A	3.66	UNII-2C

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Internal	N/A	4.38	UNII-3
2	N/A	N/A	Internal	N/A	3.00	UNII-3

Note:

(1) This EUT supports MIMO 2X2, any transmit signals are correlated with each other,

So Directional gain $=10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$dBi, then,

1) For UNII-1, Directional gain $=10\log[(10^{4.11/20}+10^{4.21/20})^2/2]$dBi $=7.17$dBi.

So, the output power limit is $24-7.17+6=22.83$, the power density limit is $11-7.17+6=9.83$.

2) For UNII-2A, Directional gain $=10\log[(10^{4.38/20}+10^{4.05/20})^2/2]$dBi $=7.23$dBi.

So, the output power limit is $24-7.23+6=22.77$, the power density limit is $11-7.23+6=9.77$.

3) For UNII-2C, Directional gain $=10\log[(10^{4.07/20}+10^{3.66/20})^2/2]$dBi $=6.88$dBi.

So, the output power limit is $24-6.88+6=23.12$, the power density limit is $11-6.88+6=10.12$.

4) For UNII-3, Directional gain $=10\log[(10^{4.38/20}+10^{3.00/20})^2/2]$dBi $=6.73$dBi.

So, the output power limit is $30-6.73+6=29.27$, the power density limit is $30-6.73+6=29.27$.

(2) Both Ant. 1 and Ant. 2 had been tested and the test data of Ant. 1 were the worst case. a mode has only one antenna transmits, n/ac mode can transmit two antennas at the same time.

3. TEST RESULTS

For BT:

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
1.68	1.4723	10.44	11.0662	0.00324	1	Complies

For 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
1.68	1.4723	7.39	5.4828	0.00161	1	Complies

For 2.4GHz:

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
4.65	2.9174	28.02	633.8697	0.36809	1	Complies

For 5GHz:

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
6.73	4.7098	23.61	229.6149	0.21525	1	Complies

For the max simultaneous transmission MPE:

Power Density (S) (mW/cm^2) BT	Power Density (S) (mW/cm^2) 2.4GHz	Power Density (S) (mW/cm^2) 5GHz	Total	Limit of Power Density (S) (mW/cm^2)	Test Result
0.00324	0.36809		0.37133	1	Complies
0.00324		0.21525	0.21849	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report