



RF Exposure Evaluation Report

Application No.: SZEM1910019578CR
Applicant: Inflight Audio
Address of Applicant: 3rd Floor, Block 7 Belfield Office Park, Clonskeagh, D04T3K6, Ireland
Manufacturer: NIGAT ELECTRONIC (SHENZHEN)CO., LTD
Address of Manufacturer: #343 ShaJing DaDao, ShaJing, ShenZhen, GuangDong, (PRC) China
Factory: NIGAT ELECTRONIC (SHENZHEN)CO., LTD
Address of Factory: #343 ShaJing DaDao, ShaJing, ShenZhen, GuangDong, (PRC) China

Equipment Under Test (EUT):

Product Name: Inflight Entertainment server

Model No.: Everhub

Trade mark: Inflight Dublin

FCC ID: 2AVXPGEN4

47 CFR Part 1.1307

Standards: 47 CFR Part 1.1310

47 CFR Part 2.1091

Date of Receipt: 2019-10-28

Date of Test: 2019-11-01 to 2019-12-27

Date of Issue: 2019-12-31

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager




SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch EMC Laboratory

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-12-31		Original

Authorized for issue by:			
			
		<hr/> Damon Su /Project Engineer	
			
		<hr/> Eric Fu /Reviewer	



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4 General Information

4.1 General Description of EUT

Power Supply:	DC 16.8V by battery.
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	ANT1: 3.07dBi; ANT2: 2.85dBi



4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout * G) / (4 * \pi * R^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 mW/cm² . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



4.1.3 EUT RF Exposure Evaluation

Antenna Gain: ANT1: 3.07dBi; ANT2: 2.85dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is ANT1: 2.03; ANT2: 1.93 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

ANT1

Mode	Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
11B	High	2462	17.22	52.72	0.0213	1.0	PASS
11G	Middle	2437	21.54	142.56	0.0575	1.0	PASS
11N20SISO	Middle	2462	19.47	83.56	0.0337	1.0	PASS
11N40SISO	Low	2422	19.19	82.99	0.0335	1.0	PASS

ANT2

Mode	Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
11B	High	2462	16.17	41.40	0.0159	1.0	PASS
11G	Low	2437	20.68	116.95	0.0449	1.0	PASS
11N20SISO	High	2412	18.69	73.96	0.0284	1.0	PASS
11N40SISO	Low	2422	18.56	71.78	0.0276	1.0	PASS

Note: Refer to report No. SZEM191001957801 for EUT test Max Conducted Peak Output Power value. The distance r (4th column) calculated from the Friis transmission formula is far greater than 20 cm separation requirement.

1) exposure conditions for simultaneous transmission operations

Simultaneous transmission MPE test is not required, because the Max. sum of the MPE ratios for WiFi 2.4G is $0.0575 + 0.0449 = 0.1024 < 1$

- End of the Report -

