



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

Email: ee.shenzhen@sgs.com

Report No.: SZEM170300184904

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RF Exposure Evaluation Report

Application No.: SZEM1703001849CR
Applicant: Standard Euler, Inc.
Manufacturer: Jetta Company Limited
EUT Name: Puck
Model No.: Puck
Trade mark: Flair
FCC ID: 2AK78PUCKU
Standards: 47 CFR Part 1.1307 (2016)
47 CFR Part 1.1310 (2016)
Date of Receipt: 2017-03-15
Date of Test: 2017-03-15 to 2017-05-09
Date of Issue: 2017-05-12

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

Authorized Signature:



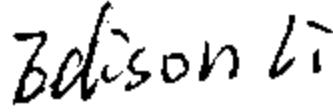
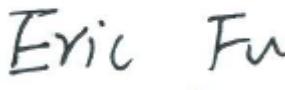
Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2017-05-12		Original

Authorized for issue by:			
		Edison Li /Project Engineer	
		Eric Fu /Reviewer	

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4 General Information

4.1 Client Information

Applicant:	Standard Euler, Inc.
Address of Applicant:	805 Kains Ave, Albany, CA 94706
Manufacturer:	Jetta Company Limited
Address of Manufacturer:	19 On Kui St., On Lok Tsuen, Fanling, NT, HK, Hong Kong

4.2 General Description of EUT

Product Name:	Puck
Model No.:	Puck
Trade mark:	Flair
Power Supply	3.0V DC (2 x alkaline AAA cell Batteries) AC Adapter Model: TY0500100A1mn Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 5V, 1.0A
Sample Type:	Fixed production
For BLE:	
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth V4.0 BLE
Modulation Type:	GFSK
Number of Channel:	40
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
For 905MHz-925MHz:	
Frequency range:	905MHz-925MHz
Modulation Type:	GFSK
Number of channels:	5
Antenna type:	Ceramic Antenna
Antenna gain:	-1dBi

For 802.11b/g/n(HT20): Note: The single module approval by TCB(FCC ID:2ADUIESP-12-F).	
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Antenna Type:	PCB Antenna
Antenna Gain:	1dBi

Remark:

Model No.: Puck

There are two colors of the above model, only the sample and adapter with black was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, only different on color of appearance.

4.3 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.

4.4 Test Facility

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

- CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC

Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- 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 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- 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.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 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: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = power density in mW/cm²

P_{out} = 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

P_d is 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

For BLE:

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Highest	2480	-3.95	0.403	0.00008	1.0	PASS

Note: Refer to report No. SZEM170300184902 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 905MHz-925MHz:

Antenna Gain: -1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.7943 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Middle	915	-4.33	0.370	0.000058	1.0	PASS

Note: Refer to report No. SZEM170300184903 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 802.11b/g/n(HT20):

Antenna Gain: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.2589 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Low	2412	15.58	36.14	0.009052	1.0	PASS

Note: Refer to report No. BCTC-15080163 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 BLE, 905MHz-925MHz and 802.11b/g/n(HT20) is $0.00008+0.000058+0.009052=0.00919 < 1$