



**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  
Email: ee.shenzhen@sgs.com

Report No.: SZEM180500410304  
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**1 Cover page**

# RF Exposure Evaluation Report

**Application No.:** SZEM1805004103CR  
**Applicant:** ParemTech  
**Address of Applicant:** 51973 Willford Road, Wainfleet, Ontario, Canada, L0S 1V0  
**Manufacturer/ Factory:** ParemTech  
**Address of Manufacturer/ Factory:** 51973 Willford Road, Wainfleet, Ontario, Canada, L0S 1V0  
**Equipment Under Test (EUT):**  
**EUT Name:** PTLevel Wireless  
**Model No.:** PTLEVEL-20-R  
**Trade mark:** PTLevel  
**FCC ID:** 2APY4-PTLEVEL20R  
**Standard(s) :** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
**Date of Receipt:** 2018-05-17  
**Date of Test:** 2018-05-23 to 2018-07-05  
**Date of Issue:** 2018-07-10

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu  
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

<i>Revision Record</i>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
01		2018-07-10		Original

<b>Authorized for issue by:</b>			
			
		_____ Harry Wu /Project Engineer	
			
		_____ Eric Fu /Reviewer	



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## 4 General Information

### 4.1 General Description of EUT

Power supply:	Adapter Model: XS-0800500 Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 8.0V, 0.5A
<b>For 915MHz:</b>	
Operating Frequency:	915MHz
Type of Modulation:	GFSK
Channel Number:	1
Antenna Type:	Integral
Antenna Gain:	2dBi
<b>For Wifi 2.4G:</b>	
Antenna Gain:	3.72dBi
Antenna Type:	Internal Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n(HT20 and HT40):
Number of Channels:	802.11b/g/n(HT20): 11 802.11n(HT40):7
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz



## 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:

- **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 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.



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**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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	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:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

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 is the limit of MPE, 1 mW/cm<sup>2</sup>. 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 individually.



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**4.1.3 EUT RF Exposure Evaluation**

**915MHz**

Antenna Gain: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.58 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 <sup>2</sup> )	Limit	Result
Middle	915	-18.99	0.013	0.000003	0.61	PASS

Note: Refer to report No. SZEM180500410302 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.

**Wifi**

Antenna Gain: 3.74dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.366 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 <sup>2</sup> )	Limit	Result
Middle	2437	15.53	35.727	0.0071	1.0	PASS

Note: Refer to report No. RXA1709-0323RF02R3 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.

**Simultaneous transmission:(Worst Case)**

	915MHz Antenna	Wifi Antenna	Sum	Limit	Result
MPE Ratio	0.000005	0.0071	0.007105	1	PASS

According to 447498 D01, Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0.

- End of the Report -