



# RF Exposure Evaluation Report

**Application No.:** SZEM1911020623CR  
**Applicant:** Generac Power Systems, Inc.  
**Address of Applicant:** S45 W29290 HWY-59, Waukesha, WI 53189, United States.  
**Manufacturer:** Generac Power Systems, Inc.  
**Address of Manufacturer:** S45 W29290 HWY-59, Waukesha, WI 53189, U.S.A.  
**Factory:** Generac Power Systems, Inc.  
**Address of Factory:** 211 Murphy Dr, Eagle, WI 53119, United States.  
**Product Name:** Power Zone Connectivity Server  
**Model No.:** 10000039844  
**FCC ID:** VDE-PZCONSVR  
 47 CFR Part 1.1307  
**Standards:** 47 CFR Part 1.1310  
 47 CFR Part 2.1091  
**Date of Receipt:** 2019-11-27  
**Date of Test:** 2019-11-27 to 2019-12-03  
**Date of Issue:** 2019-12-04

<b>Test Result :</b>	<b>Pass*</b>
----------------------	--------------

\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu  
 EMC Laboratory Manager



## 2 Version

<i>Revision Record</i>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
01		2019-12-04		Original

<b>Authorized for issue by:</b>			
			
		<hr/> <b>Edison Li /Project Engineer</b>	
			
		<hr/> <b>Eric Fu /Reviewer</b>	



### 3 Contents

	Page
1 COVER PAGE .....	1
2 VERSION .....	2
3 CONTENTS .....	3
4 GENERAL INFORMATION .....	4
4.1 GENERAL DESCRIPTION OF EUT .....	4
4.2 TEST LOCATION .....	5
4.3 TEST FACILITY .....	5
4.4 DEVIATION FROM STANDARDS .....	5
4.5 ABNORMALITIES FROM STANDARD CONDITIONS .....	5
4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER .....	5
5 RF EXPOSURE EVALUATION .....	6
5.1 RF EXPOSURE COMPLIANCE REQUIREMENT .....	6
5.1.1 <i>Limits</i> .....	6
5.1.2 <i>Test Procedure</i> .....	6
5.1.3 <i>EUT RF Exposure Evaluation</i> .....	7-8



## 4 General Information

### 4.1 General Description of EUT

Power Supply:	DC 12V
Internal Source:	More than 108MHz
<b>For Bluetooth</b>	
Frequency Range:	2402MHz to 2480MHz
Bluetooth Version:	V4.1
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Hopping Channel Type:	Adaptive Frequency Hopping systems
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels:	79
Sample Type:	Fixed device
Antenna Type:	Integral
Antenna Gain:	1.5dBi
<b>For BLE</b>	
Frequency Range:	2402MHz to 2480MHz
Bluetooth Version:	V4.1
Modulation Type:	GFSK
Number of Channels:	40
Sample Type:	Fixed device
Antenna Type:	Integral
Antenna Gain:	1.5dBi
<b>For 802.11b/g/n</b>	
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	802.11b: DSSS(CCK, DQPSK, D BPSK) 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) 802.11n(HT20): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Numbers:	802.11b/g, 802.11n HT20: 11 Channels
Sample Type:	Fixed device
Antenna Type:	Integral
Antenna Gain:	1.5dBi



## 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.

- **Innovation, Science and Economic Development Canada**

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

CAB identifier: CN0006.

IC#: 4620C.

## 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

For Uncontrolled Environment, the MPE limit of 1500MHz to 100000MHz is 1.0 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 at lowest, middle and highest channel individually.



### 5.1.3 EUT RF Exposure Evaluation

#### 1) Test Results

##### For Bluetooth

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant1	1.5	1.41	5.13	3.26	0.0009	1	0.0009	PASS

Note: Refer to report No. SZEM191102062302 or EUT test Max Conducted Peak Output Power value.

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

##### For BLE

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant1	1.5	1.41	5.04	3.19	0.0009	1	0.0009	PASS

Note: Refer to report No. SZEM191102062303 or EUT test Max Conducted Peak Output Power value.

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



**For 802.11b/g/n**

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant1	1.5	1.41	22.63	183.23	0.0515	1	<b>0.0515</b>	PASS

Note: Refer to report No. SZEM191102062304 or EUT test Max Conducted Peak Output Power value.

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

Remark: The Bluetooth and Wifi function can't synchronous transmission at the same time.

End of Report

