

## COMPLIANCE WORLDWIDE INC. TEST REPORT 162-25RF

In Accordance with the Requirements of  
Federal Communications Commission CFR Title 47 Part 2.1091:2020  
Radio Frequency Exposure Evaluation: Mobile Devices  
Innovation, Science and Economic Development Canada  
RSS-102, Issue 6  
Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus

Issued to

**BLP Technologies Inc  
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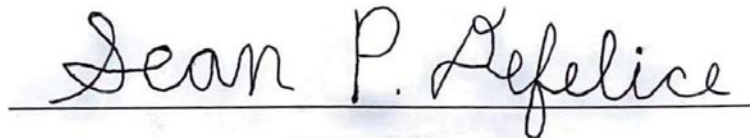
for the

**Sensorworx Advanced Wireless Lighting Load Controller  
with 0-10V Dimming  
Model: SWX-970-D2  
903-927 MHz Transmitter**

**FCC ID: 2AVRY-SWX00004  
IC: 26012-SWX00004**

**Report Issued on May 30, 2025**

Tested by



Sean P. Defelice

Reviewed by



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## 1. Scope

This test report certifies that the BLP Technologies Sensorworx Advanced Lighting Load Controller, Model SWX-970-D2, as tested, meets the FCC Part 2.1091 requirements and the ISED RSS-102, Issue 6 Section 6.1 requirements exempting the device from a SAR Evaluation.

The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

## 2. Product Details

2.1. Manufacturer:	BLP Technologies
2.2. Model Numbers:	SWX-970-D2
2.3. Serial Numbers:	Date Code 250312
2.4. Description:	Advanced Lighting Load Controller with 0-10V Dimming.
2.5. Power Source:	120 VAC, 60 Hz
2.6. Hardware Revision:	N/A
2.7. Software Revision:	N/A
2.8. Modulation Types:	FSK and Gaussian frequency shift keying
2.9. Operating Frequencies:	915 MHz Nominal, 903 MHz, 915 MHz and 927 MHz and 2.4 GHz BLE
2.10. EMC Modifications:	None

## 3. Product Configuration

### 3.1. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
BLP Technologies	SWX-970-D2	Date Code 250312	120	60	

### 3.2. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
None				

### 3.3. Cables

Cable Type	Length	Shield	From	To
Power Cable	2M	No	EUT	AC Mains Power

### 3. Product Configuration (continued)

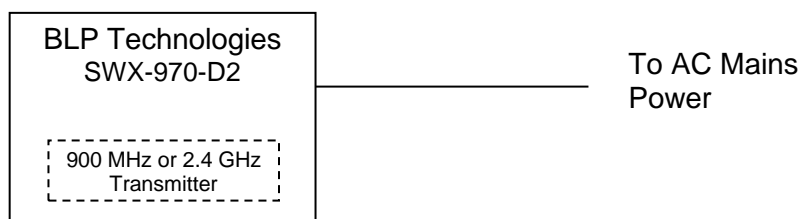
#### 3.4. Operational Characteristics & Software

- Normal Operating Mode: the white led is indicating a 1 second 'on' then a 1 second 'off' heartbeat (continually). This is a visual indication that the processor is executing the test firmware successfully.
- Command Mode: the user can enter a command instruction from the 'Normal operating mode' only. Press and release the button sequentially to enter the desired command number, the blue led will illuminate feedback for each button press (the white led will remain off during this time). The processor allows a pause of 1 second between sequential button presses before interpreting the entered command. After entering a command, the processor will provide feedback for the command entered. (2) rapid white led flashes indicates the command was successfully executed, and (2) rapid blue flashes indicate the command failed.

Commands (button pressed):

1. Stop all radio transmitters
2. Transmit continuously on Bluetooth LE Channel 37, 2402MHz (lowest)
3. Transmit continuously on Bluetooth LE Channel 17, 2440MHz (middle)
4. Transmit continuously on Bluetooth LE Channel 39, 2480MHz (highest)
5. Transmit continuously on each Bluetooth LE Channel for 1 second, then repeat sequence continuously
6. Transmit continuously on Proprietary Channel 1, 903MHz (lowest)
7. Transmit continuously on Proprietary Channel 11, 915MHz (middle)
8. Transmit continuously on Proprietary Channel 21, 927MHz (highest)

#### 3.5. Block Diagram



## 4. Measurements Parameters

### 4.1. Measurement Equipment and Software Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
Spectrum Analyzer, 9 kHz to 40 GHz <sup>3</sup>	Rohde & Schwarz	FSV40	100899	6/27/2025	1 Year
Barometric Pressure/Humidity & Temp Datalogger	Extech Instruments	SD700	Q590483	4/4/2026	2 Years

<sup>3</sup> FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016 Previous V2.30 SP1, installed 10/22/2014.

### 4.2. Software Used to Perform Test

Manufacturer	Software Description	Title or Model #	Rev.	Report Sections
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0	Used to process conducted emissions data

### 4.3 Measurement & Equipment Setup

Test Dates:	4/4/2025
Test Engineer:	Sean Defelice
Site Temperature (°C):	17.5
Relative Humidity (%RH):	48
Frequency Ranges:	902 to 928 MHz 2.4 to 2.4835 GHz
Measurement Distance:	3 Meters and 1 Meter
EMI Receiver IF Bandwidth:	200 Hz (30 kHz – 150 kHz) 9 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1 GHz) 1 MHz – Above 1 GHz
EMI Receiver Avg Bandwidth:	≥ 3 * RBW or IF(BW)
Detector Functions:	Peak, Quasi-Peak and Average

## **4. Measurements Parameters (continued)**

### **4.4 Test Procedure**

Test measurements were made in accordance FCC Part 15.247: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5850 MHz, and 24.0 - 24.25 GHz.

The measurement procedures in this report are in accordance with ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. FCC OET Publication Number KDB 558074 D01 v05r02, Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS), Frequency Hopping Spread Spectrum Systems, and Hybrid System Devices Operating Under §15.247, dated April 2, 2019 and ISED RSS-247, Issue 3, Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices were referenced for the test procedures used to generate the data in this report. All references to these publications refer to this versions and dates detailed in this paragraph.

In addition, FCC KDB 447498 D01 General RF Exposure Guidance v06, October 23, 2015 are referenced for the testing and requirements detailed in this report.

In addition, ISED RSS-102, Issue 6, (December 15, 2023) are referenced for the testing and requirements detailed in this report.

## 5. Choice of Equipment for Test Suits

### 5.1 Choice of Model

This test report is based on the test samples supplied by the manufacturer and are reported by the manufacturer to be equivalent to the production units.

### 5.2 Presentation

This test sample was tested complete with all required ancillary equipment. Refer to Section 3 of this report for product equipment configuration.

### 5.3 Choice of Operating Frequencies

The EUT, as tested, operates on 21 channels in the 902 MHz to 928 MHz band.

In accordance with ANSI C63.10-2013, section 5.6, and FCC Part 15.31 (m), the choice of operating frequencies selected for the testing detailed in this report are outlined in the following tables:

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	903.0	8	911.4	15	919.8
2	904.2	9	912.6	16	921.0
3	905.4	10	913.8	17	922.2
4	906.6	11	915.0	18	923.4
5	907.8	12	916.2	19	924.6
6	909.0	13	917.4	20	925.8
7	910.2	14	918.6	21	927.0

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

### 5.4 EUT Position for Emissions Measurements

During all radiated mode measurement testing, the EUT was mounted on a polystyrene foam to simulate the device being wall mounted.

## 6. Measurement Data (continued)

### 6.1. Maximum Conducted Output Power (FCC 15.247 (b)(3), ISED RSS-247 5.4 d)

**Requirement:** The maximum peak conducted output power of the intentional radiator shall not exceed the following: For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt (+30 dBm).

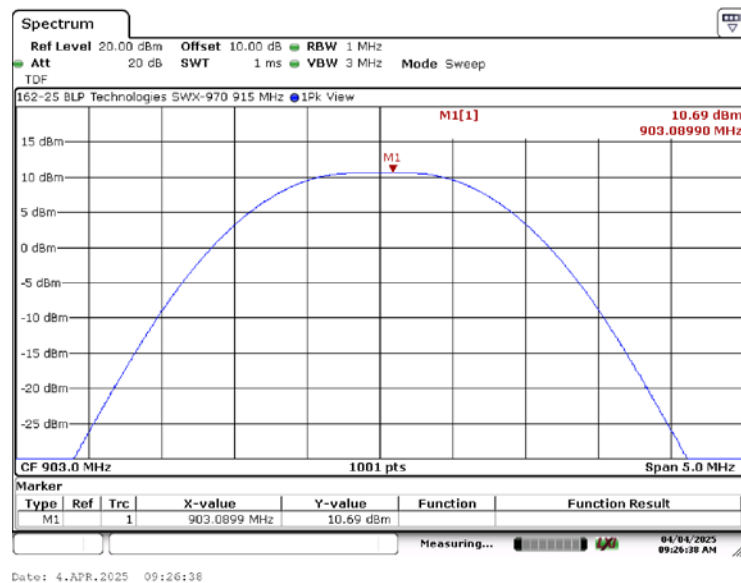
**Procedure:** This test was performed in accordance with the procedure detailed in ANSI C63.10:2013 Clause 11.9.1.1.

**Test Note:** A spectrum analyzer resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz were used to meet the requirements ANSI C63.10:2013 Clause 11.9.1.1 RBW ≥ DTS bandwidth.

**Results:** The device under test meets the required maximum peak conducted output power level of 1 Watt (30 dBm).

Channel	Frequency	Maximum Peak Conducted Output Power	Peak Limit	Margin	Result
	(MHz)	(dBm)	(dBm)	(dB)	
1	903	10.69	30	-19.31	Compliant
11	915	11.57	30	-18.43	Compliant
21	927	10.18	30	-19.82	Compliant

#### 6.1.1. Low Channel – 1, 903 MHz

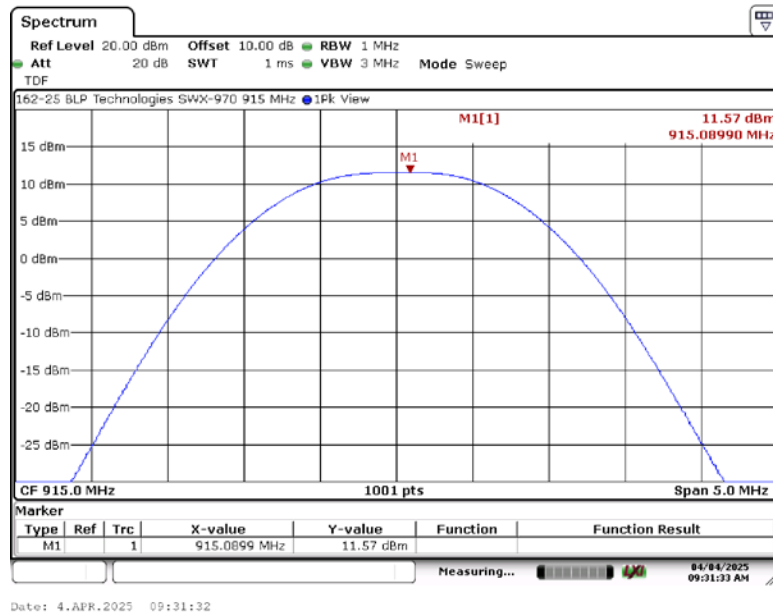




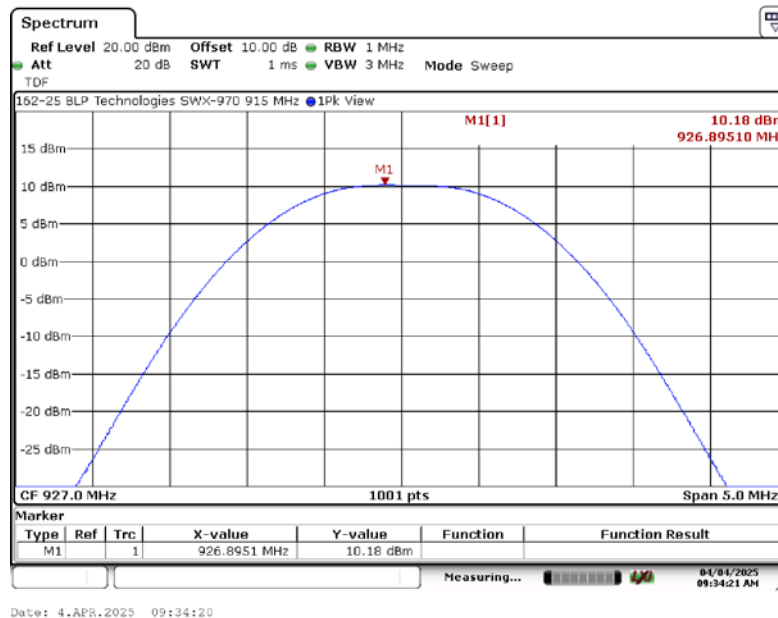
## 6. Measurement Data (continued)

### 6.1. Maximum Conducted Output Power (FCC 15.247 (b)(3), ISED RSS-247 5.4 d)

#### 6.1.2. Mid Channel – 915 MHz



#### 6.1.3. High Channel – 927 MHz



## 6. Measurement Data (continued)

### 6.2. Maximum Conducted Output Power (FCC 15.247 (b)(3), ISED RSS-247 5.4 d)

**Requirement:** The maximum peak conducted output power of the intentional radiator shall not exceed the following: For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt (+30 dBm).

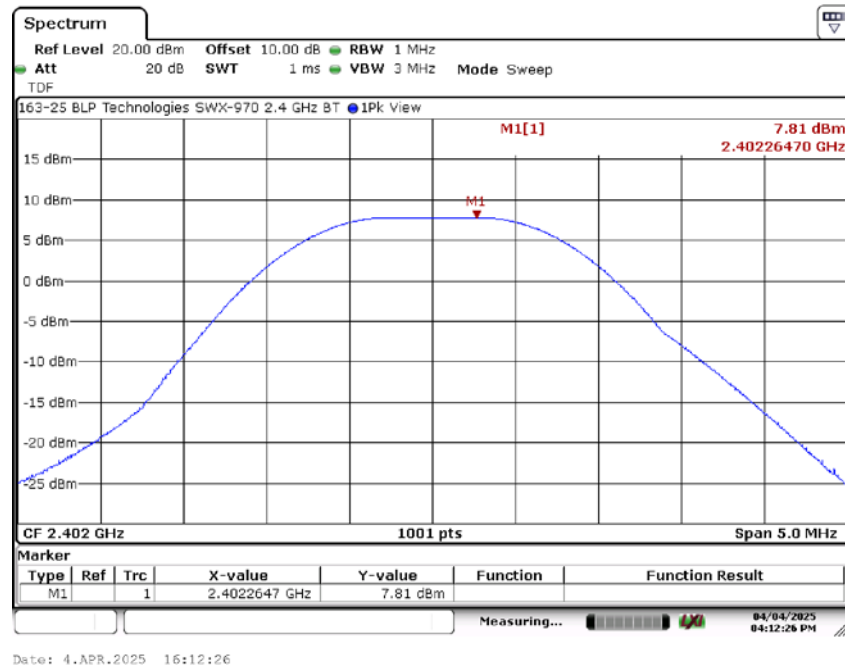
**Procedure:** This test was performed in accordance with the procedure detailed in ANSI C63.10:2013 Clause 11.9.1.1.

**Test Note:** A spectrum analyzer resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz were used to meet the requirements ANSI C63.10:2013 Clause 11.9.1.1 RBW ≥ DTS bandwidth.

**Results:** The device under test meets the required maximum peak conducted output power level of 1 Watt (30 dBm).

BLE Channel	Frequency	Maximum Peak Conducted Output Power	Peak Limit	Margin	Result
	(MHz)	(dBm)	(dBm)	(dB)	
37	2402	7.81	30.00	-22.19	Compliant
17	2440	7.99	30.00	-22.01	Compliant
39	2480	8.06	30.00	-21.94	Compliant

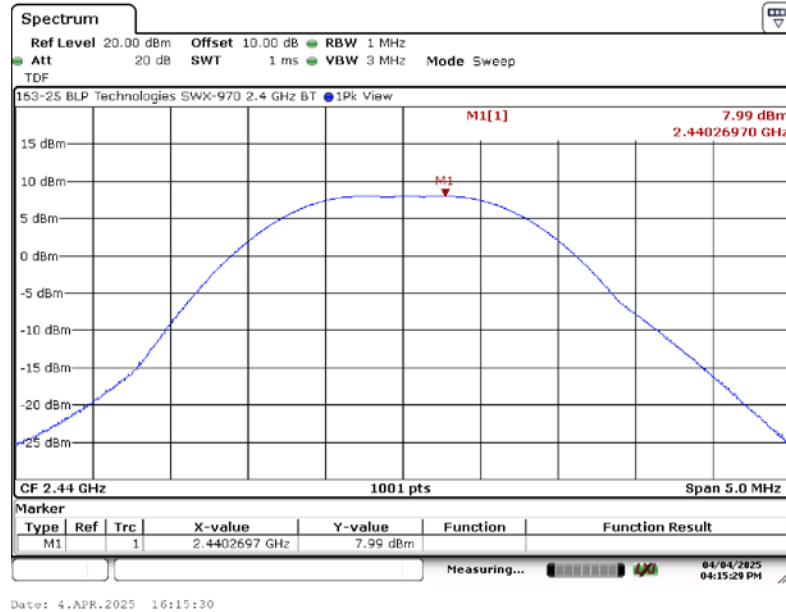
#### 6.2.1. Low Channel – 37, 2402 MHz



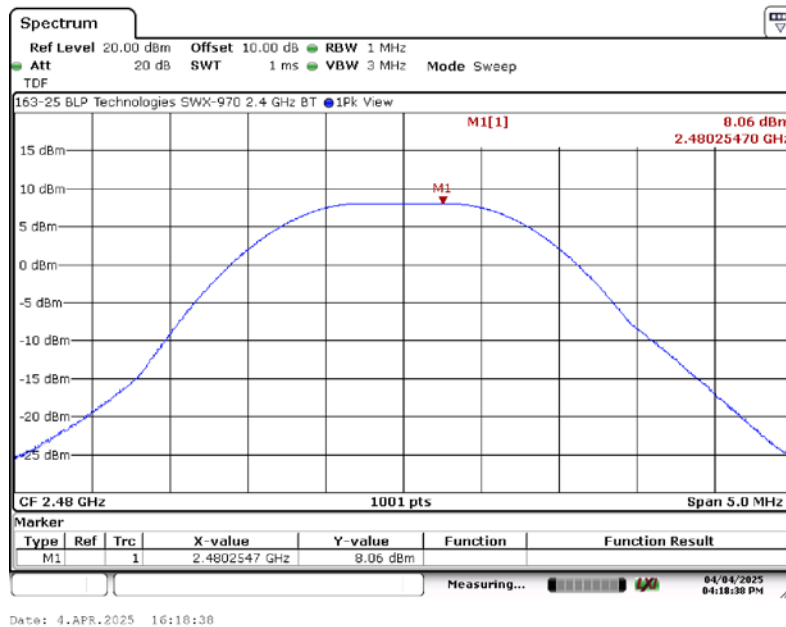
## 6. Measurement Data (continued)

### 6.2. Maximum Conducted Output Power (FCC 15.247 (b)(3), ISED RSS-247 5.4 d)

#### 6.2.2. Middle Channel – 17, 2440 MHz



#### 6.2.3. High Channel – 39, 2480 MHz



## 6. Measurement Data (continued)

### 6.3. Public Exposure to Radio Frequency Energy Levels (FCC Part 2.1091:2020)

#### 6.3.1. 1.1307 (b) (1) Public Exposure

Requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

Frequency (MHz)	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm <sup>2</sup> )	Result
				(mW/cm <sup>2</sup> )	(W/m <sup>2</sup> )		
				(4)		(5)	
903	20	10.69	-1.0	0.001852380	0.01852380	0.6020000	Compliant
915	20	11.57	-1.0	0.002268455	0.02268455	0.6100000	Compliant
927	20	10.18	-1.0	0.001647139	0.01647139	0.6180000	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

- PD = Power Density (mW/cm<sup>2</sup>)
- OP = DUT Output Power (dBm)
- AG = DUT Antenna Gain (dBi)
- d = MPE Distance (cm)

1. Reference CFR 2.1091: For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.
2. Table 6.1 of this test report.
3. Johanson Technology 0915AT43A0026E chip antenna specifications..
4. Power density is calculated from conducted output power and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure. Limit = f/1500, where f is in MHz.

Results: Passed - The device under test meets the exclusion requirement detailed for a device with a separation distance of 20 cm.

**Worst-case Ratio to Limit = 0.0023 / 0.61 = 0.0037**

## 6. Measurement Data (continued)

### 6.4. Public Exposure to Radio Frequency Energy Levels (FCC Part 2.1091:2020)

#### 6.4.1. 1.1307 (b) (1) Public Exposure

Requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

Frequency (MHz)	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm <sup>2</sup> )	Result
				(mW/cm <sup>2</sup> )	(W/m <sup>2</sup> )		
				(4)		(5)	
2402.00	20	7.81	0.0	0.00120	0.01202	1.0	Compliant
2440.00	20	7.99	0.0	0.00125	0.01252	1.0	Compliant
2480.00	20	8.06	0.0	0.00127	0.01273	1.0	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

- PD = Power Density (mW/cm<sup>2</sup>)
- OP = DUT Output Power (dBm)
- AG = DUT Antenna Gain (dBi)
- d = MPE Distance (cm)

1. Reference CFR 2.1091: For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.
2. Table 6.2 of this test report.
3. Johanson Technology 2450AT42B100 chip antenna specifications.
4. Power density is calculated from conducted output power and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure. Limit = 1.0.

Results: Passed - The device under test meets the exclusion requirement detailed for a device with a separation distance of 20 cm.

**Worst-case Ratio to Limit = 0.00127 / 1.0 = 0.00127**

**Sum of Ratios for Simultaneous operation shall be ≤ 1**

**0.0037 + 0.00127 = 0.00497**

## 6. Measurement Data (continued)

### 6.5. Radio Frequency (RF) Exposure of Radiocommunication Apparatus (RSS-102, Issue 6)

#### 6.5.1. RSS-102 Issue 6 Requirements

Requirement: Requirement: RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} \times f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz.

Results: Compliant

Frequency	Separation Distance	Maximum Power <sup>1</sup>		RSS-102 Exemption Limit <sup>2</sup>	Result
(MHz)	(cm)	(mW)	(Watts)	(Watts)	
903	≥ 20	11.722	0.01172	1.37	Compliant
915	≥ 20	14.355	0.01435	1.38	Compliant
927	≥ 20	10.423	0.01042	1.40	Compliant

<sup>1</sup> Reference Section 6.1 of this report. Converted measured power in dBm to milliwatts and watts.

<sup>2</sup> Reference RSS-102, § 6.6 Exemption Limits for Routine Evaluation – RF Exposure Evaluation for distances greater than 20 cm.

The following formula was used to determine the exemption limit (W):

$$1.31 \times 10^{-2} \times f^{0.6834} \quad (f = \text{frequency (MHz)})$$

**Worst Case Ratio to Limit = 0.01435 / 1.38 = 0.0104**

## 6. Measurement Data (continued)

### 6.6. Radio Frequency (RF) Exposure of Radiocommunication Apparatus (RSS-102, Issue 6)

#### 6.6.1. RSS-102 Issue 6 Requirements

Requirement: Requirement: RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} \times f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz.

Results: Compliant

Frequency	Separation Distance	Maximum Power <sup>1</sup>		RSS-102 Exemption Limit <sup>2</sup>	Result
(MHz)	(cm)	(mW)	(Watts)	(Watts)	
2402.00	≥ 20	6.039	0.00604	2.68	Compliant
2440.00	≥ 20	6.295	0.00630	2.71	Compliant
2480.00	≥ 20	6.397	0.00640	2.74	Compliant

<sup>1</sup> Reference Section 6.2 of this report. Converted measured power in dBm to milliwatts and watts.

<sup>2</sup> Reference RSS-102, § 6.6 Exemption Limits for Routine Evaluation – RF Exposure Evaluation for distances greater than 20 cm.

The following formula was used to determine the exemption limit (W):

$$1.31 \times 10^{-2} \times f^{0.6834} \quad (f = \text{frequency (MHz)})$$

**Worst Case Ratio to Limit =  $0.00640 / 2.74 = 0.00234$**

**Sum of Ratios for Simultaneous operation shall be less  $\leq 1$**

$$0.0104 + 0.00234 = \mathbf{0.01274}$$