

# NORTHWEST EMC

**Bioworld Merchandising, Inc.**

**Foundmi 2**

**FCC 15.247:2016**

**Bluetooth Low Energy Radio**

**Report # BWMI0002.1**



NVLAP Lab Code: 201049-0

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# CERTIFICATE OF TEST

Last Date of Test: November 30, 2016  
Bioworld Merchandising, Inc.  
Model: Foundmi 2

## Radio Equipment Testing

### Standards

Specification	Method
FCC 15.247:2016	ANSI C63.10:2013

### Results

Method Clause	Test Description	Applied	Results	Comments
6.2	AC - Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	No	N/A	Not required for C2PC. See Product description for details.
11.8.2	Occupied Bandwidth	No	N/A	Not required for C2PC. See Product description for details.
11.9.1.1	Output Power	Yes	Pass	
11.10.2	Power Spectral Density	No	N/A	Not required for C2PC. See Product description for details.
11.11	Band Edge Compliance	No	N/A	Not required for C2PC. See Product description for details.
11.11	Spurious Conducted Emissions	No	N/A	Not required for C2PC. See Product description for details.

### Deviations From Test Standards

None

### Approved By:



Jeremiah Darden, Operations Manager

*Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.*

# REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

# ACCREDITATIONS AND AUTHORIZATIONS

## United States

**FCC** - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

**A2LA** - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

**NVLAP** - Each laboratory is accredited by NVLAP to ISO 17025

## Canada

**IC** - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

## European Union

**European Commission** – Validated by the European Commission as a Notified Body under the R&TTE Directive.

## Australia/New Zealand

**ACMA** - Recognized by ACMA as a CAB for the acceptance of test data.

## Korea

**MSIP / RRA** - Recognized by KCC's RRA as a CAB for the acceptance of test data.

## Japan

**VCCI** - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

## Taiwan

**BSMI** – Recognized by BSMI as a CAB for the acceptance of test data.

**NCC** - Recognized by NCC as a CAB for the acceptance of test data.

## Singapore

**IDA** – Recognized by IDA as a CAB for the acceptance of test data.

## Israel

**MOC** – Recognized by MOC as a CAB for the acceptance of test data.

## Hong Kong

**OFCA** – Recognized by OFCA as a CAB for the acceptance of test data.

## Vietnam

**MIC** – Recognized by MIC as a CAB for the acceptance of test data.

## SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>

<http://gsi.nist.gov/global/docs/cabs/designations.html>

# MEASUREMENT UNCERTAINTY

## Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

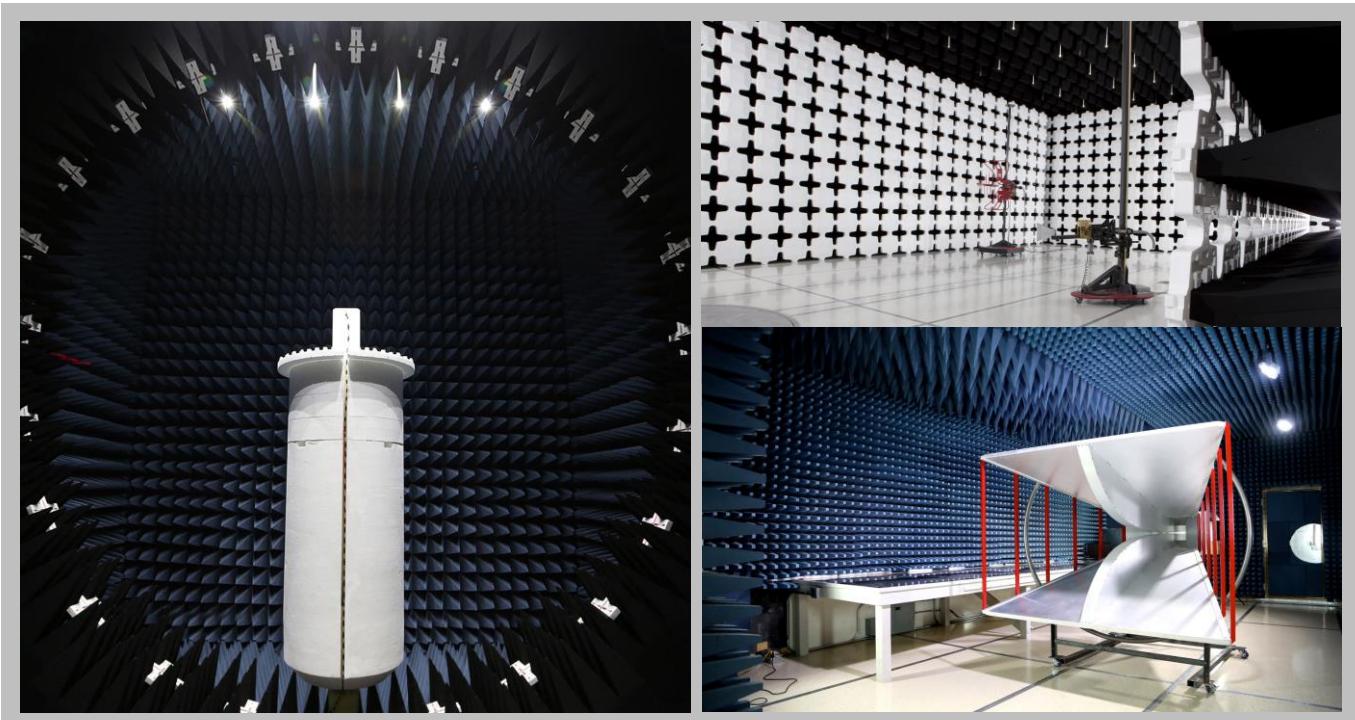
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

<u>Test</u>	<u>+ MU</u>	<u>- MU</u>
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.9 dB	-4.9 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

# FACILITIES

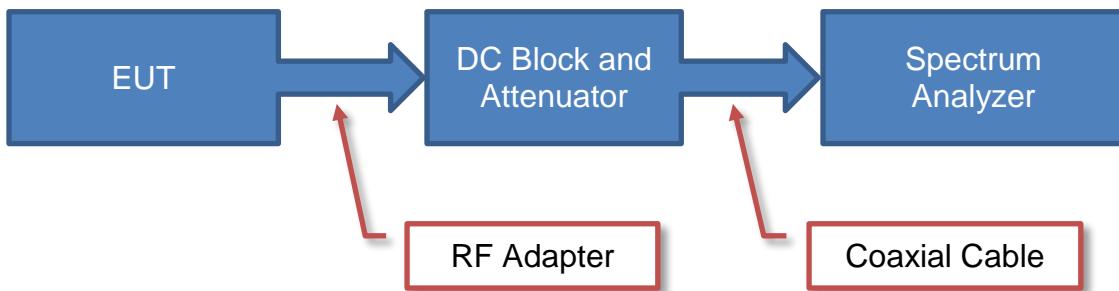


California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120 <sup>th</sup> Ave NE Bothell, WA 98011 (425)984-6600
<b>NVLAP</b>					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code: 201049-0	NVLAP Lab Code: 200629-0
<b>Industry Canada</b>					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
<b>BSMI</b>					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
<b>VCCI</b>					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
<b>Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA</b>					
US0158	US0175	N/A	US0017	US0191	US0157

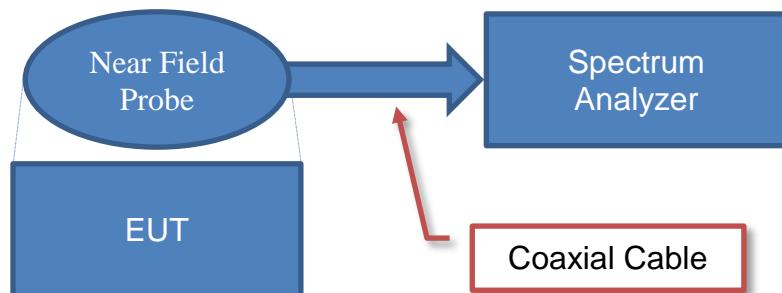


# Test Setup Block Diagrams

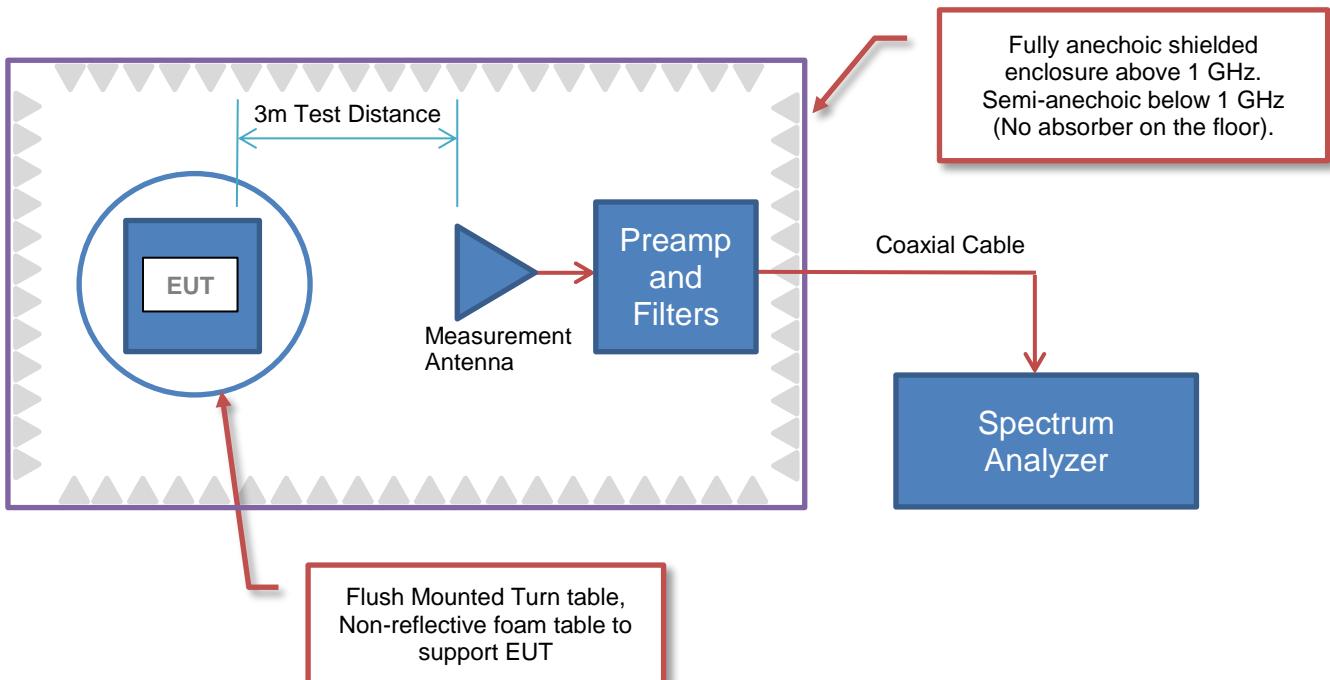
## Antenna Port Conducted Measurements



## Near Field Test Fixture Measurements



## Spurious Radiated Emissions



# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

<b>Company Name:</b>	Bioworld Merchandising, Inc.
<b>Address:</b>	2111 W. Walnut Hill Ln.
<b>City, State, Zip:</b>	Irving, TX 75038
<b>Test Requested By:</b>	Kit Chan
<b>Model:</b>	Foundmi 2
<b>First Date of Test:</b>	November 29, 2016
<b>Last Date of Test:</b>	November 30, 2016
<b>Receipt Date of Samples:</b>	November 29, 2016
<b>Equipment Design Stage:</b>	Prototype
<b>Equipment Condition:</b>	No Damage
<b>Purchase Authorization:</b>	Verified

## Information Provided by the Party Requesting the Test

### **Functional Description of the EUT:**

Keychain based on Bluetooth Low Energy with Nordic nRF51822 chipset>

#### Device operations:

Attach and track your keys, wallets, and everything.

Double press keychain to find your phone.

In camera mode, double press keychain to take selfie.

#### Associated iOS/Android apps operations:

In list view, choose tag and press FIND to locate your item.

In map view, display last known time and location of your item.

Can track up to 8 items.

Family 2 revises the PCB layout and includes a firmware update with new features

### **Testing Objective:**

To demonstrate compliance of the Bluetooth radio to FCC 15.247 requirements for a Class II Permissive Change to FCC ID: 2AH7W-F0116.

# CONFIGURATIONS

## Configuration BWMI0002- 1

EUT					
Description		Manufacturer		Model/Part Number	Serial Number
Radio Module (Direct Connect)		Bioworld Merchandising, Inc.		Foundmi 2	None

### Peripherals in test setup boundary

Peripherals in test setup boundary					
Description		Manufacturer		Model/Part Number	Serial Number
FTDI Friend Module		Adafruit		284	GC-2-94V-0
Laptop Computer		Lenovo		20308	0B07240618
AC/DC Adapter (Laptop)		Insignia		NS-PWLC563	14K11A0003239

### Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
TX/RX Control Wires	No	0.2m	No	Radio Module (Direct Connect)	FTDI Friend Module
USB to Mini-USB	No	1.5m	No	FTDI Friend Module	Laptop Computer
AC Power (Adapter)	No	2.0m	No	AC Mains	AC/DC Adapter (Laptop)
DC Power (Adapter)	No	1.0m	No	AC/DC Adapter (Laptop)	Laptop Computer
EUT DC Power Leads	No	1.2m	No	DC Power Supply	Radio Module (Direct Connect)

## Configuration BWMI0002- 2

EUT					
Description		Manufacturer		Model/Part Number	Serial Number
Radio Module (Radiated)		Bioworld Merchandising, Inc.		Foundmi 2	None

### Peripherals in test setup boundary

Peripherals in test setup boundary					
Description		Manufacturer		Model/Part Number	Serial Number
FTDI Friend Module		Adafruit		284	GC-2-94V-0

### Remote Equipment Outside of Test Setup Boundary

Remote Equipment Outside of Test Setup Boundary					
Description		Manufacturer		Model/Part Number	Serial Number
Laptop Computer		Lenovo		20308	0B07240618
AC/DC Adapter (Laptop)		Insignia		NS-PWLC563	14K11A0003239

### Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
TX/RX Control Wires	No	0.2m	No	Radio Module (Direct Connect)	FTDI Friend Module
AC Power (Adapter)	No	2.0m	No	AC Mains	AC/DC Adapter (Laptop)
DC Power (Adapter)	No	1.0m	No	AC/DC Adapter (Laptop)	Laptop Computer
EUT DC Power Leads	No	1.2m	No	DC Power Supply	Radio Module (Direct Connect)
USB Extension	No	5m	No	USB to Mini-USB (Radiated)	Laptop Computer
USB to Mini-USB (Radiated)	No	1.5m	No	FTDI Friend Module	USB Extension

# MODIFICATIONS

## Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	11/29/2016	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	11/30/2016	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

# SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

## MODES OF OPERATION

Continuously Transmitting at Low Ch 2402 MHz, High Ch 2480 MHz

Continuously Transmitting at Low Ch 2402 MHz, Mid Ch 2442 MHz, High Ch 2480 MHz

## POWER SETTINGS INVESTIGATED

3VDC

## CONFIGURATIONS INVESTIGATED

BWMI0002 - 2

## FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz
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## SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Filter - High Pass	Micro-Tronics	HPM50111	HGC	3/4/2016	12 mo
Attenuator	Weinschel Corp	4H-20	AWB	3/9/2016	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	8/5/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	11/18/2016	12 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	8/5/2016	24 mo
Cable	Northwest EMC	18-40GHz	TXE	11/18/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	10/12/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	10/18/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Cable	Northwest EMC	8-18GHz	TXD	5/31/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	5/31/2016	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJN	9/15/2016	24 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	5/31/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1551	PAH	11/9/2016	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	4/13/2016	24 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	11/9/2016	12 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	3/15/2016	12 mo

## TEST DESCRIPTION

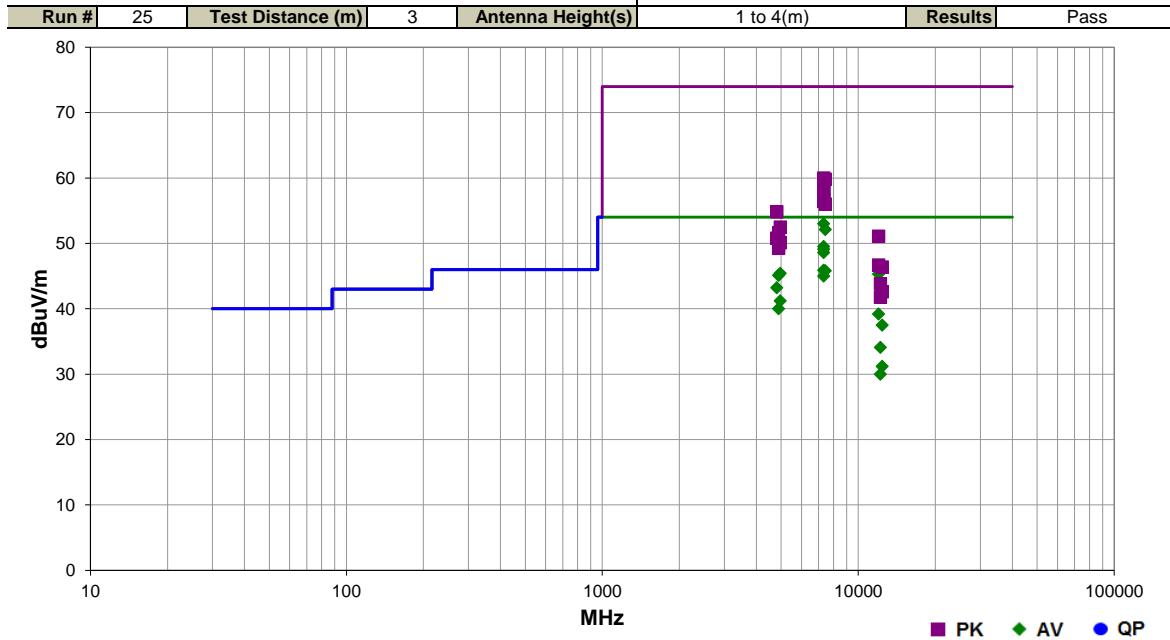
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

# SPURIOUS RADIATED EMISSIONS

**NORTHWEST**  
**EMC**  
PSA-ESCI 2016.07.22  
EmiR5 2016.08.26

Work Order:	BWMI0002	Date:	11/29/16	
Project:	None	Temperature:	23.7 °C	
Job Site:	TX02	Humidity:	36.2% RH	
Serial Number:	None	Barometric Pres.:	1007 mbar	
EUT:	Foundmi 2	Tested by:	Jonathan Kiefer	
Configuration:	2			
Customer:	Bioworld Merchandising, Inc.			
Attendees:	None			
EUT Power:	3VDC			
Operating Mode:	Continuously Transmitting at Low Ch 2402 MHz, Mid Ch 2442 MHz, High Ch 2480 MHz			
Deviations:	None			
Comments:	Harmonics. Power level settings: Low Ch 4dBm, Mid Ch -5dBm, High Ch -5dBm.			

Test Specifications	Test Method
FCC 15.247:2016	ANSI C63.10:2013



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7326.375	39.4	13.6	1.7	358.9	3.0	0.0	Horz	AV	0.0	53.0	54.0	-1.0	Mid Ch, EUT Horz, -5dBm
7440.392	38.5	13.6	1.6	0.0	3.0	0.0	Horz	AV	0.0	52.1	54.0	-1.9	High Ch, EUT Horz, -5dBm
4804.292	44.1	6.2	2.0	345.0	3.0	0.0	Horz	AV	0.0	50.3	54.0	-3.7	Low Ch, EUT Horz, 4dBm
7326.283	35.9	13.6	4.0	7.0	3.0	0.0	Vert	AV	0.0	49.5	54.0	-4.5	Mid Ch, EUT Vert, -5dBm
7326.267	35.5	13.6	3.0	46.9	3.0	0.0	Vert	AV	0.0	49.1	54.0	-4.9	Mid Ch, EUT Horz, -5dBm
7326.425	35.0	13.6	1.3	183.0	3.0	0.0	Horz	AV	0.0	48.6	54.0	-5.4	Mid Ch, EUT On Side, -5dBm
7326.125	32.3	13.6	1.2	60.0	3.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	Mid Ch, EUT Vert, -5dBm
7440.317	32.2	13.6	1.2	201.9	3.0	0.0	Vert	AV	0.0	45.8	54.0	-8.2	High Ch, EUT Vert, -5dBm
4960.225	39.0	6.4	2.2	207.9	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	High Ch, EUT Horz, -5dBm
12011.380	47.6	-2.3	3.5	2.0	3.0	0.0	Horz	AV	0.0	45.3	54.0	-8.7	Low Ch, EUT Horz, -5dBm
4884.225	38.7	6.4	1.9	337.0	3.0	0.0	Horz	AV	0.0	45.1	54.0	-8.9	Mid Ch, EUT Horz, -5dBm
7326.517	31.4	13.6	1.3	243.9	3.0	0.0	Vert	AV	0.0	45.0	54.0	-9.0	Mid Ch, EUT On Side, -5dBm
4804.225	37.0	6.2	1.2	255.9	3.0	0.0	Vert	AV	0.0	43.2	54.0	-10.8	Low Ch, EUT Vert, 4dBm
4960.300	34.8	6.4	1.9	324.0	3.0	0.0	Vert	AV	0.0	41.2	54.0	-12.8	High Ch, EUT Vert, -5dBm
7326.058	46.4	13.6	1.7	358.9	3.0	0.0	Horz	PK	0.0	60.0	74.0	-14.0	Mid Ch, EUT Horz, -5dBm
4884.125	33.6	6.4	1.3	258.0	3.0	0.0	Vert	AV	0.0	40.0	54.0	-14.0	Mid Ch, EUT Vert, -5dBm
7439.883	46.2	13.6	1.6	0.0	3.0	0.0	Horz	PK	0.0	59.8	74.0	-14.2	High Ch, EUT Horz, -5dBm
12011.280	41.5	-2.3	1.3	187.0	3.0	0.0	Vert	AV	0.0	39.2	54.0	-14.8	Low Ch, EUT Vert, -5dBm
7327.225	44.7	13.6	1.3	183.0	3.0	0.0	Horz	PK	0.0	58.3	74.0	-15.7	Mid Ch, EUT On Side, -5dBm
7326.858	44.6	13.6	4.0	7.0	3.0	0.0	Vert	PK	0.0	58.2	74.0	-15.8	Mid Ch, EUT Vert, -5dBm
7325.608	44.3	13.6	3.0	46.9	3.0	0.0	Vert	PK	0.0	57.9	74.0	-16.1	Mid Ch, EUT Horz, -5dBm
12399.900	38.6	-1.1	2.3	75.0	3.0	0.0	Horz	AV	0.0	37.5	54.0	-16.5	High Ch, EUT Horz, -5dBm
7325.808	43.2	13.6	1.2	60.0	3.0	0.0	Horz	PK	0.0	56.8	74.0	-17.2	Mid Ch, EUT Vert, -5dBm

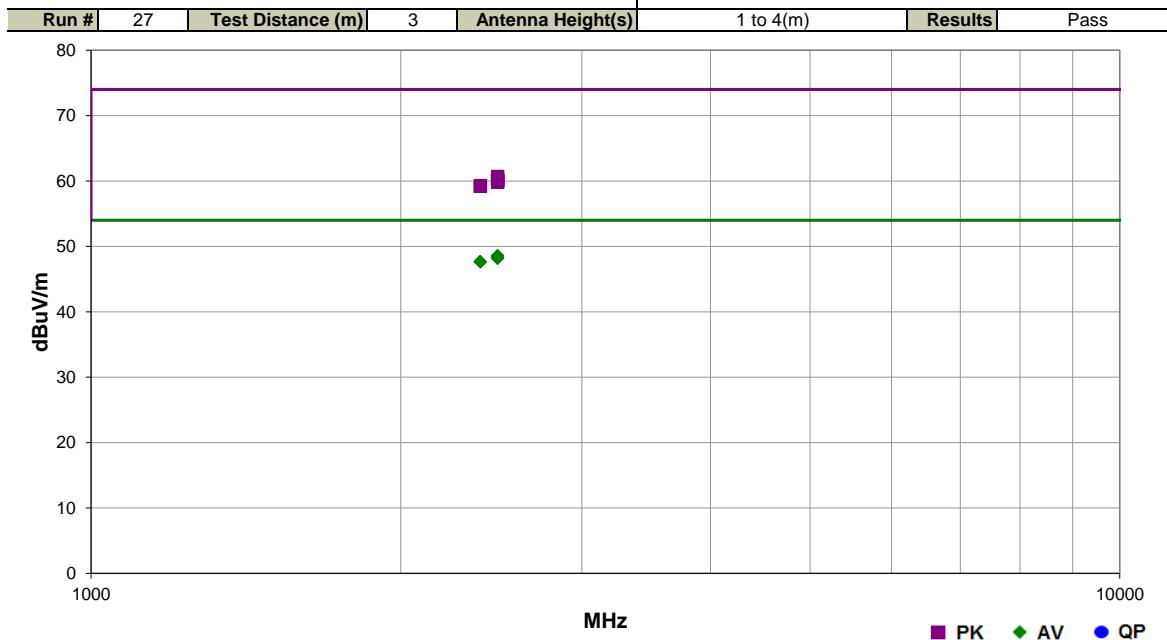
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7326.758	42.8	13.6	1.3	243.9	3.0	0.0	Vert	PK	0.0	56.4	74.0	-17.6	Mid Ch, EUT On Side, -5dBm
7441.158	42.4	13.6	1.2	201.9	3.0	0.0	Vert	PK	0.0	56.0	74.0	-18.0	High Ch, EUT Vert, -5dBm
4804.383	48.6	6.2	2.0	345.0	3.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	Low Ch, EUT Horz, 4dBm
12211.190	35.9	-1.8	3.5	3.0	3.0	0.0	Horz	AV	0.0	34.1	54.0	-19.9	Mid Ch, EUT Horz, -5dBm
4960.408	46.1	6.4	2.2	207.9	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	High Ch, EUT Horz, -5dBm
4884.458	45.2	6.4	1.9	337.0	3.0	0.0	Horz	PK	0.0	51.6	74.0	-22.4	Mid Ch, EUT Horz, -5dBm
12399.840	32.3	-1.1	1.3	0.0	3.0	0.0	Vert	AV	0.0	31.2	54.0	-22.8	High Ch, EUT Vert, -5dBm
12009.730	53.4	-2.3	3.5	2.0	3.0	0.0	Horz	PK	0.0	51.1	74.0	-22.9	Low Ch, EUT Horz, -5dBm
4804.317	44.6	6.2	1.2	255.9	3.0	0.0	Vert	PK	0.0	50.8	74.0	-23.2	Low Ch, EUT Vert, 4dBm
4959.767	43.7	6.4	1.9	324.0	3.0	0.0	Vert	PK	0.0	50.1	74.0	-23.9	High Ch, EUT Vert, -5dBm
12211.180	31.8	-1.8	1.3	85.0	3.0	0.0	Vert	AV	0.0	30.0	54.0	-24.0	Mid Ch, EUT Vert, -5dBm
4883.583	42.9	6.4	1.3	258.0	3.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	Mid Ch, EUT Vert, -5dBm
12009.880	49.0	-2.3	1.3	187.0	3.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Low Ch, EUT Vert, -5dBm
12399.890	47.5	-1.1	2.3	75.0	3.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	High Ch, EUT Horz, -5dBm
12209.700	45.8	-2.0	3.5	3.0	3.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	Mid Ch, EUT Horz, -5dBm
12399.630	43.7	-1.1	1.3	0.0	3.0	0.0	Vert	PK	0.0	42.6	74.0	-31.4	High Ch, EUT Vert, -5dBm
12210.580	43.7	-1.9	1.3	85.0	3.0	0.0	Vert	PK	0.0	41.8	74.0	-32.2	Mid Ch, EUT Vert, -5dBm

# SPURIOUS RADIATED EMISSIONS

**NORTHWEST**  
**EMC**  
 PSA-ESCI 2016.07.22  
 EmiR5 2016.08.26

Work Order:	BWMI0002	Date:	11/29/16	
Project:	None	Temperature:	23.7 °C	
Job Site:	TX02	Humidity:	36.2% RH	
Serial Number:	None	Barometric Pres.:	1007 mbar	
EUT:	Foundmi 2	Tested by:	Jonathan Kiefer	
Configuration:	2			
Customer:	Bioworld Merchandising, Inc.			
Attendees:	None			
EUT Power:	3VDC			
Operating Mode:	Continuously Transmitting at Low Ch 2402 MHz, High Ch 2480 MHz			
Deviations:	None			
Comments:	Band Edge. Power level settings: Low Ch 4dBm, Mid Ch -5dBm, High Ch -5dBm.			

Test Specifications	Test Method
FCC 15.247:2016	ANSI C63.10:2013



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec.	Comments
2484.947	33.3	-4.7	1.3	267.9	3.0	20.0	Horz	AV	0.0	48.6	54.0	-5.4	High Ch, EUT Horz, -5dBm
2484.160	33.1	-4.7	1.3	247.0	3.0	20.0	Vert	AV	0.0	48.4	54.0	-5.6	High Ch, EUT Horz, -5dBm
2485.033	32.9	-4.7	1.2	324.0	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	High Ch, EUT Vert, -5dBm
2484.727	32.9	-4.7	1.3	322.9	3.0	20.0	Vert	AV	0.0	48.2	54.0	-5.8	High Ch, EUT Vert, -5dBm
2483.537	32.9	-4.7	1.3	308.0	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	High Ch, EUT On Side, -5dBm
2484.870	32.9	-4.7	1.2	291.0	3.0	20.0	Vert	AV	0.0	48.2	54.0	-5.8	High Ch, EUT On Side, -5dBm
2389.533	33.1	-5.4	1.2	57.0	3.0	20.0	Horz	AV	0.0	47.7	54.0	-6.3	Low Ch, EUT Horz, 4dBm
2390.742	33.0	-5.4	1.2	0.0	3.0	20.0	Vert	AV	0.0	47.6	54.0	-6.4	Low Ch, EUT Horz, 4dBm
2484.270	45.4	-4.7	1.3	267.9	3.0	20.0	Horz	PK	0.0	60.7	74.0	-13.3	High Ch, EUT Horz, -5dBm
2483.753	44.9	-4.7	1.2	291.0	3.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	High Ch, EUT On Side, -5dBm
2484.663	44.8	-4.7	1.3	247.0	3.0	20.0	Vert	PK	0.0	60.1	74.0	-13.9	High Ch, EUT Horz, -5dBm
2484.197	44.8	-4.7	1.2	324.0	3.0	20.0	Horz	PK	0.0	60.1	74.0	-13.9	High Ch, EUT Vert, -5dBm
2484.947	44.7	-4.7	1.3	308.0	3.0	20.0	Horz	PK	0.0	60.0	74.0	-14.0	High Ch, EUT On Side, -5dBm
2484.193	44.5	-4.7	1.3	322.9	3.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	High Ch, EUT Vert, -5dBm
2390.758	44.7	-5.4	1.2	57.0	3.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	Low Ch, EUT Horz, 4dBm
2389.258	44.6	-5.4	1.2	0.0	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	Low Ch, EUT Horz, 4dBm

# OUTPUT POWER

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Power Supply - DC	B&K Precision	9110	TQI	NCR	NCR
Cable	Fairview Microwave	SCK0963-60	TXF	11/18/2016	11/18/2017
Block - DC	Fairview Microwave	SD3379	AMM	2/25/2016	2/25/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/25/2016	2/25/2017
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10/4/2016	10/4/2017

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

**De Facto EIRP Limit:** The EUT meets the de facto EIRP limit of +36 dBm.

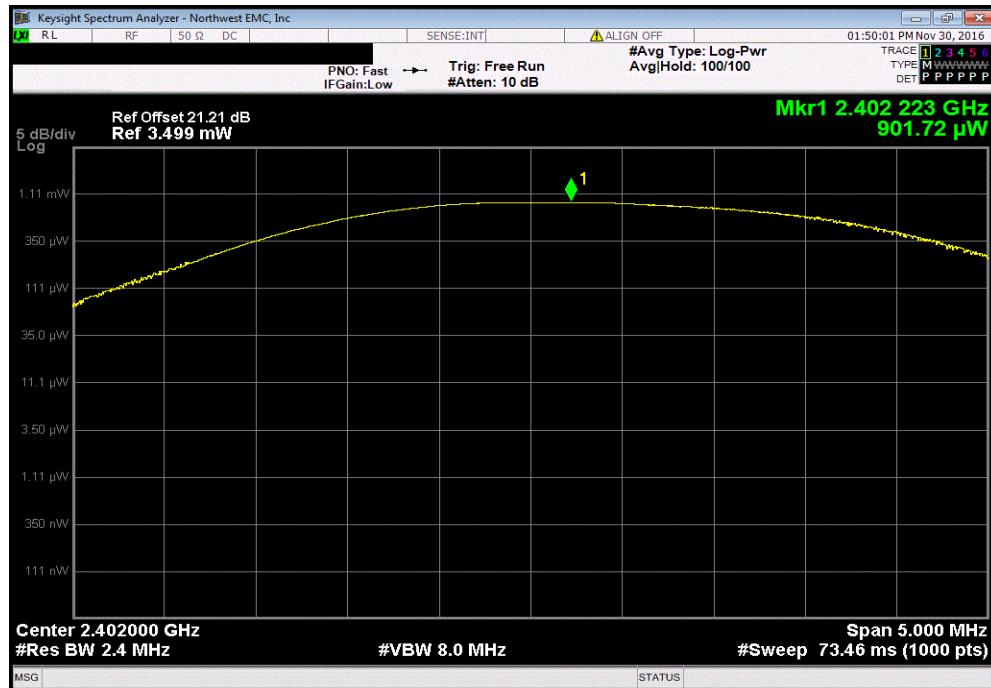
# OUTPUT POWER

EUT:	Foundmi 2	Work Order:	BWMI0002
Serial Number:	None	Date:	11/30/16
Customer:	Bioworld Merchandising, Inc.	Temperature:	23.4 °C
Attendees:	None	Humidity:	29.7% RH
Project:	None	Barometric Pres.:	1020 mbar
Tested by:	Jonathan Kiefer	Power:	3VDC
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2016		ANSI C63.10:2013	
COMMENTS			
Power settings: Low Ch 4dBm, Mid Ch -5dBm, High Ch -5dBm.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature	<i>Jonathan Kiefer</i>
		Value	Limit (-)
		901.72 uW	1 W
		155.84 uW	1 W
		168.4 uW	1 W

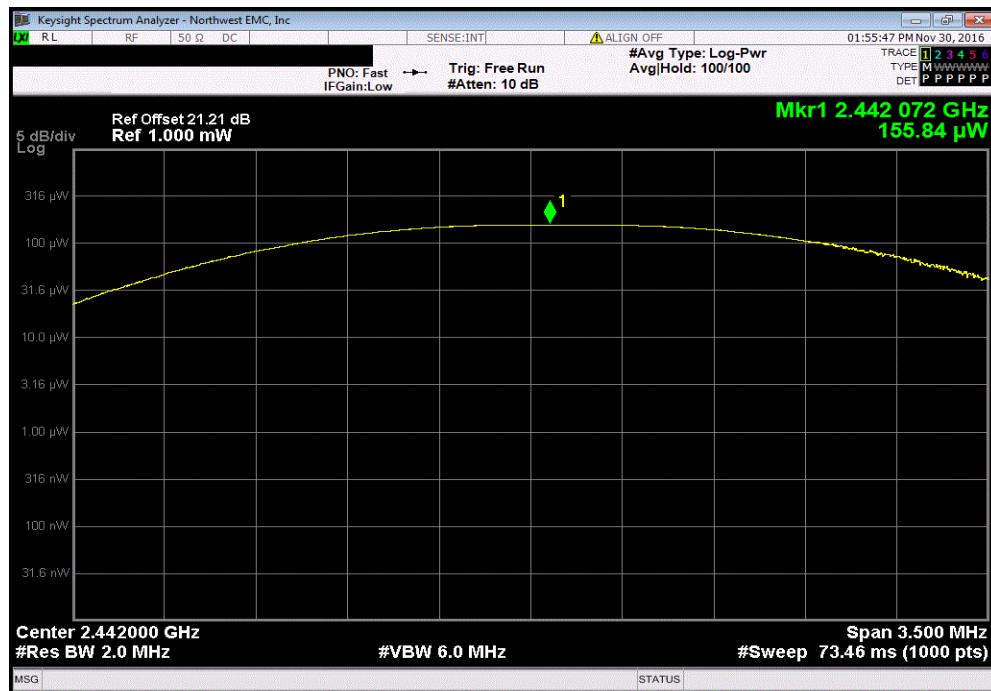
Low Channel, 2402 MHz  
Mid Channel, 2442 MHz  
High Channel, 2480 MHz

# OUTPUT POWER

Low Channel, 2402 MHz			Value	Limit (<)	Result
			901.72 uW	1 W	Pass



Mid Channel, 2442 MHz			Value	Limit (<)	Result
			155.84 uW	1 W	Pass



# OUTPUT POWER

High Channel, 2480 MHz			Value	Limit (<)	Result
			168.4 $\mu$ W	1 W	Pass

