

# NORTHWEST EMC

## **Boston Scientific Neuromodulation**

**Implantable Pulse Generator Model SC-1140**

**FCC 15.209:2016**

**Inductive Radio Module**

**Report # BOSN0057**



NVLAP Lab Code: 200676-0

*This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America. This Report may only be duplicated in its entirety*

# CERTIFICATE OF TEST

Last Date of Test: June 21, 2016  
Boston Scientific Neuromodulation  
Model: SC-1140

## Radio Equipment Testing

### Standards

| Specification   | Method           |
|-----------------|------------------|
| FCC 15.209:2016 | ANSI C63.10:2013 |

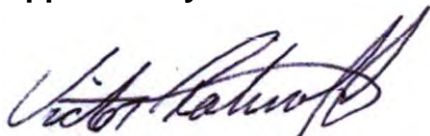
### Results

| Method Clause | Test Description              | Applied | Results | Comments                                |
|---------------|-------------------------------|---------|---------|---|
| 6.2           | Powerline Conducted Emissions | No      | N/A     | Not required for a battery powered EUT. |
| 6.4           | Field Strength of Fundamental | Yes     | Pass    |   |
| 6.4, 6.5      | Spurious Radiated Emissions   | Yes     | Pass    |   |

### Deviations From Test Standards

None

### Approved By:



Victor Ratnoff, 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

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## United States

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**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

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## Canada

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

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## European Union

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

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## Australia/New Zealand

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

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## Korea

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

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## Japan

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

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## Taiwan

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**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.

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## Singapore

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

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## Israel

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

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## Hong Kong

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

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## Vietnam

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

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## 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

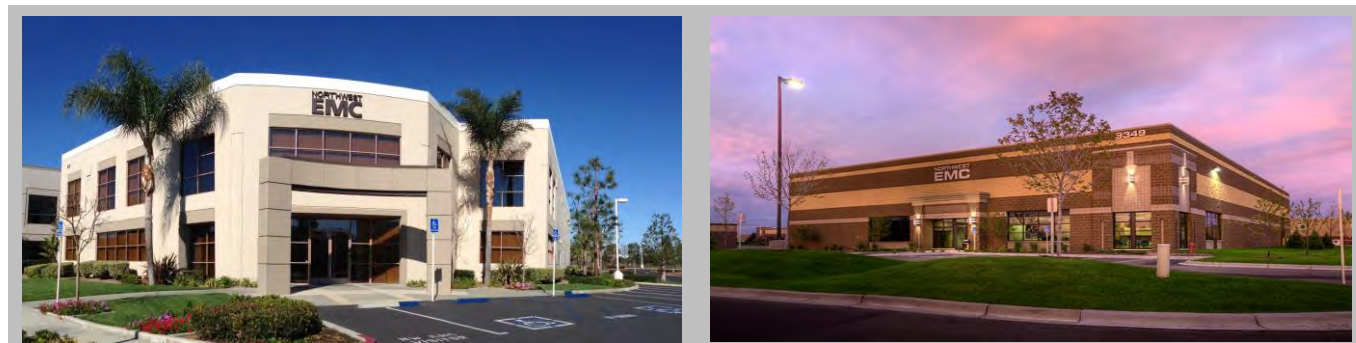
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement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

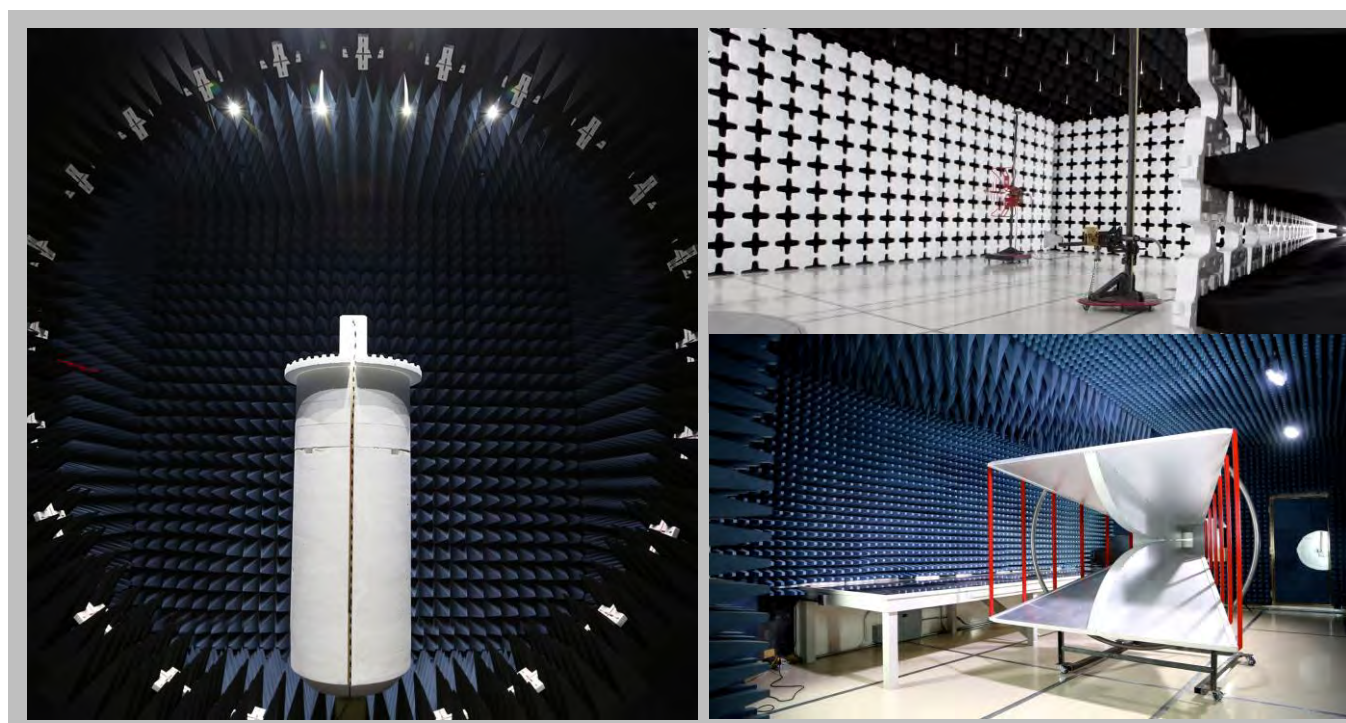
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

| <b>Test</b>                           | <b>+ MU</b> | <b>- MU</b> |
|---------------------------------------|-------------|-------------|
| 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)                   | 5.2 dB      | -5.2 dB     |
| AC Powerline Conducted Emissions (dB) | 2.4 dB      | -2.4 dB     |

# FACILITIES



|   |   |  |   |  |   |
|---|---|--|---|--|---|
| <b>California</b><br>Labs OC01-13<br>41 Tesla<br>Irvine, CA 92618<br>(949) 861-8918 | <b>Minnesota</b><br>Labs MN01-08, MN10<br>9349 W Broadway Ave.<br>Brooklyn Park, MN 55445<br>(612)-638-5136 | <b>New York</b><br>Labs NY01-04<br>4939 Jordan Rd.<br>Elbridge, NY 13060<br>(315) 554-8214 | <b>Oregon</b><br>Labs EV01-12<br>22975 NW Evergreen Pkwy<br>Hillsboro, OR 97124<br>(503) 844-4066 | <b>Texas</b><br>Labs TX01-09<br>3801 E Plano Pkwy<br>Plano, TX 75074<br>(469) 304-5255 | <b>Washington</b><br>Labs NC01-05<br>19201 120 <sup>th</sup> Ave NE<br>Bothell, WA 98011<br>(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/RRR, MIC, MOC, NCC, OFCA</b>     |   |  |   |  |   |
| US0158  | US0175  | N/A  | US0017  | US0191   | US0157  |



# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

|                                 |                                   |
|---------------------------------|-----------------------------------|
| <b>Company Name:</b>            | Boston Scientific Neuromodulation |
| <b>Address:</b>                 | 25155 Rye Canyon Loop             |
| <b>City, State, Zip:</b>        | Santa Clarita, CA 91355           |
| <b>Test Requested By:</b>       | Habet Ter-Petrosyan               |
| <b>Model:</b>                   | SC-1140                           |
| <b>First Date of Test:</b>      | June 21, 2016                     |
| <b>Last Date of Test:</b>       | June 21, 2016                     |
| <b>Receipt Date of Samples:</b> | June 21, 2016                     |
| <b>Equipment Design Stage:</b>  | Production                        |
| <b>Equipment Condition:</b>     | No Damage                         |

## Information Provided by the Party Requesting the Test

|   |
|---|
| <b>Functional Description of the EUT:</b>   |
| Implantable Pulse Generator   |
| <b>Testing Objective:</b>   |
| To demonstrate compliance of the inductive portion of the device to FCC Part 15.209 specifications. |



# CONFIGURATIONS

## Configuration BOSN0057- 1

| Software/Firmware Running during test |  |  |  |                   |  |
|---------------------------------------|--|--|--|-------------------|--|
| Description                           |  |  |  | Version           |  |
| App FW Version                        |  |  |  | 9028384-102-00#18 |  |

| EUT                                      |                                   |                   |               |
|--|-----------------------------------|-------------------|---------------|
| Description                              | Manufacturer                      | Model/Part Number | Serial Number |
| Primary Cell Implantable Pulse Generator | Boston Scientific Neuromodulation | SC-1140           | 100112        |

| Peripherals in test setup boundary |                                   |                   |               |
|------------------------------------|-----------------------------------|-------------------|---------------|
| Description                        | Manufacturer                      | Model/Part Number | Serial Number |
| Lead 1                             | Boston Scientific Neuromodulation | SC-2218-50        | None          |
| Lead 2                             | Boston Scientific Neuromodulation | SC-2218-50        | None          |
| Human Torso Simulator              | Northwest EMC                     | None              | None          |

| Cables     |        |            |         |                   |              |
|------------|--------|------------|---------|-------------------|--------------|
| Cable Type | Shield | Length (m) | Ferrite | Connection 1      | Connection 2 |
| Lead 1     | No     | 0.5m       | No      | IPG Model SC-1140 | Saline       |
| Lead 2     | No     | 0.5m       | No      | IPG Model SC-1140 | Saline       |



# MODIFICATIONS

## Equipment Modifications

| Item | Date      | Test                          | Modification                         | Note  | Disposition of EUT                                |
|------|-----------|-------------------------------|--------------------------------------|---|---|
| 1    | 6/21/2016 | Field Strength of Fundamental | 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    | 6/21/2016 | Spurious Radiated Emissions   | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed.                  |

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

Transmitting at 125kHz

## POWER SETTINGS INVESTIGATED

Battery

## CONFIGURATIONS INVESTIGATED

BOSN0057 - 1

## FREQUENCY RANGE INVESTIGATED

|                 |       |                |         |
|-----------------|-------|----------------|---------|
| Start Frequency | 9 kHz | Stop Frequency | 490 kHz |
|-----------------|-------|----------------|---------|

## 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 |
|------------------------------|---------------|----------------------|-----|-----------|----------|
| Cable                        | Northwest EMC | 10kHz-1GHz RE Cables | OCH | 3/3/2016  | 12 mo    |
| Antenna                      | EMCO          | 6502                 | AZB | 8/14/2015 | 24 mo    |
| Analyzer - Spectrum Analyzer | Agilent       | N9010A               | AFJ | 2/9/2016  | 12 mo    |

## MEASUREMENT BANDWIDTHS

| Frequency Range (MHz) | Peak Data (kHz) | Quasi-Peak Data (kHz) | Average Data (kHz) |
|-----------------------|-----------------|-----------------------|--------------------|
| 0.01 - 0.15           | 1.0             | 0.2                   | 0.2                |
| 0.15 - 30.0           | 10.0            | 9.0                   | 9.0                |
| 30.0 - 1000           | 100.0           | 120.0                 | 120.0              |
| Above 1000            | 1000.0          | N/A                   | 1000.0             |

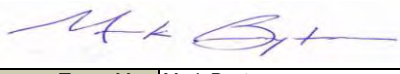
## TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

Per ANSI C63.10 sections 6.4.4.1 and 6.4.4.2, the emissions from the EUT were maximized by rotating the EUT on the turntable. Also, the EUT and/or associated antenna was positioned in 3 orthogonal planes. A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity per section 4.5.1. The center of the loop antenna was maintained at 1m above the ground plane during the testing.

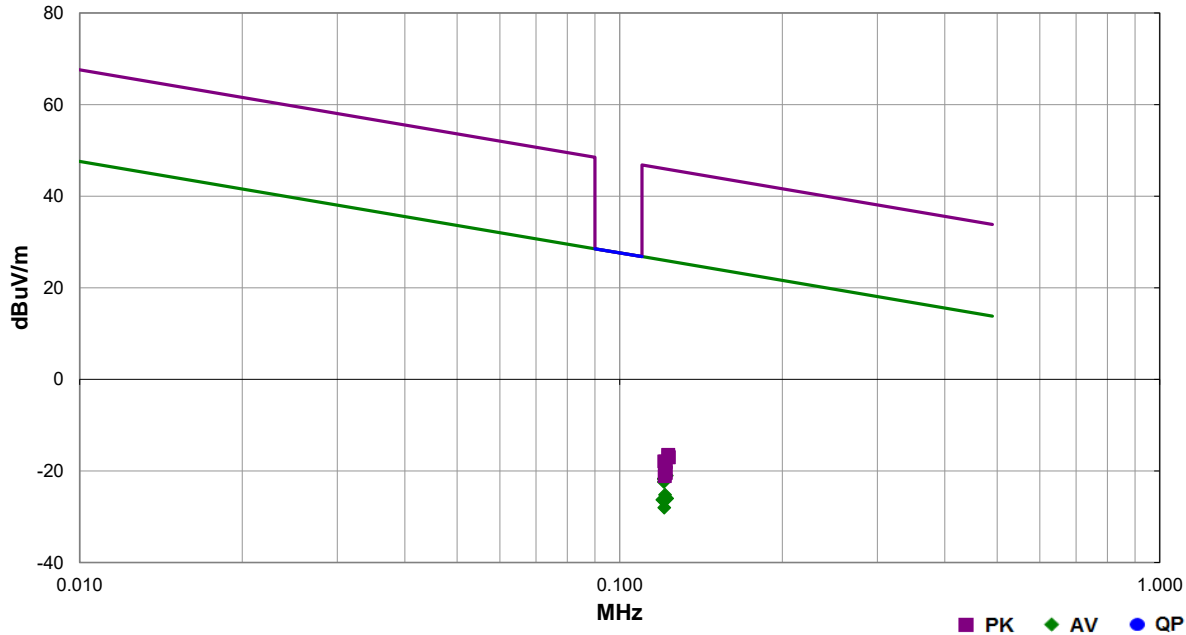
As outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

If there are no detectable emissions above the noise floor, the data included will show noise floor measurements for reference only.

|                 |   |                   |           |  |
|-----------------|---|-------------------|-----------|--|
| Work Order:     | BOSN0057  | Date:             | 06/21/16  |  |
| Project:        | None  | Temperature:      | 22.2 °C   |  |
| Job Site:       | OC10  | Humidity:         | 49.8% RH  |  |
| Serial Number:  | 100112  | Barometric Pres.: | 1017 mbar |  |
| EUT:            | IPG Model SC-1140   |                   |           |  |
| Configuration:  | 1   |                   |           |  |
| Customer:       | Boston Scientific Neuromodulation                                 |                   |           |  |
| Attendees:      | Habet Ter-Petrosyan   |                   |           |  |
| EUT Power:      | Battery   |                   |           |  |
| Operating Mode: | Transmitting at 125kHz  |                   |           |  |
| Deviations:     | None  |                   |           |  |
| Comments:       | EUT was placed in a torso simulation filled with saline solution. |                   |           |  |

| Test Specifications | Test Method      |
|---------------------|------------------|
| FCC 15.209:2016     | ANSI C63.10:2013 |

| Run # | 3 | Test Distance (m) | 3 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|---|-------------------|---|-------------------|-----------|---------|------|
|-------|---|-------------------|---|-------------------|-----------|---------|------|



| 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       |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|----------------|
| 0.122      | 48.7             | 10.3        | 1.1                     | 193.0             | 3.0                    | 0.0                       | Parallel to EUT           | AV       | -80.0                    | -21.0             | 25.9                 | -46.9                  | EUT Vertical   |
| 0.121      | 48.7             | 10.3        | 1.0                     | 44.0              | 3.0                    | 0.0                       | Perp to EUT               | AV       | -80.0                    | -21.0             | 25.9                 | -47.0                  | EUT on Side    |
| 0.121      | 48.0             | 10.3        | 1.0                     | 65.0              | 3.0                    | 0.0                       | Parallel to EUT           | AV       | -80.0                    | -21.7             | 26.0                 | -47.7                  | EUT on Side    |
| 0.121      | 47.9             | 10.3        | 1.1                     | 146.0             | 3.0                    | 0.0                       | Perp to EUT               | AV       | -80.0                    | -21.8             | 26.0                 | -47.8                  | EUT Vertical   |
| 0.121      | 47.3             | 10.3        | 1.0                     | 347.0             | 3.0                    | 0.0                       | Parallel to EUT           | AV       | -80.0                    | -22.4             | 26.0                 | -48.4                  | EUT Horizontal |
| 0.121      | 44.5             | 10.3        | 1.0                     | 144.0             | 3.0                    | 0.0                       | Parallel to GND           | AV       | -80.0                    | -25.2             | 25.9                 | -51.2                  | EUT Horizontal |
| 0.122      | 43.7             | 10.3        | 1.5                     | 241.0             | 3.0                    | 0.0                       | Perp to EUT               | AV       | -80.0                    | -26.0             | 25.9                 | -51.9                  | EUT Horizontal |
| 0.120      | 43.4             | 10.3        | 1.0                     | 206.0             | 3.0                    | 0.0                       | Parallel to GND           | AV       | -80.0                    | -26.3             | 26.2                 | -52.5                  | EUT on Side    |
| 0.121      | 41.7             | 10.3        | 1.0                     | 206.0             | 3.0                    | 0.0                       | Parallel to GND           | AV       | -80.0                    | -28.0             | 26.0                 | -54.0                  | EUT Vertical   |
| 0.123      | 53.2             | 10.3        | 1.1                     | 146.0             | 3.0                    | 0.0                       | Perp to EUT               | PK       | -80.0                    | -16.5             | 45.7                 | -62.3                  | EUT Vertical   |
| 0.123      | 52.7             | 10.3        | 1.1                     | 193.0             | 3.0                    | 0.0                       | Parallel to EUT           | PK       | -80.0                    | -17.0             | 45.8                 | -62.8                  | EUT Vertical   |
| 0.121      | 51.8             | 10.3        | 1.0                     | 347.0             | 3.0                    | 0.0                       | Parallel to EUT           | PK       | -80.0                    | -17.9             | 46.0                 | -63.9                  | EUT Horizontal |
| 0.122      | 51.7             | 10.3        | 1.0                     | 65.0              | 3.0                    | 0.0                       | Parallel to EUT           | PK       | -80.0                    | -18.0             | 45.9                 | -64.0                  | EUT on Side    |
| 0.122      | 51.7             | 10.3        | 1.0                     | 44.0              | 3.0                    | 0.0                       | Perp to EUT               | PK       | -80.0                    | -18.0             | 45.9                 | -64.0                  | EUT on Side    |
| 0.121      | 49.7             | 10.3        | 1.0                     | 144.0             | 3.0                    | 0.0                       | Parallel to GND           | PK       | -80.0                    | -20.0             | 45.9                 | -66.0                  | EUT Horizontal |
| 0.122      | 49.3             | 10.3        | 1.5                     | 241.0             | 3.0                    | 0.0                       | Perp to EUT               | PK       | -80.0                    | -20.4             | 45.9                 | -66.3                  | EUT Horizontal |
| 0.121      | 49.2             | 10.3        | 1.0                     | 206.0             | 3.0                    | 0.0                       | Parallel to GND           | PK       | -80.0                    | -20.5             | 45.9                 | -66.5                  | EUT on Side    |
| 0.121      | 48.6             | 10.3        | 1.0                     | 206.0             | 3.0                    | 0.0                       | Parallel to GND           | PK       | -80.0                    | -21.1             | 46.0                 | -67.1                  | EUT Vertical   |

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

Transmitting at 125kHz

## POWER SETTINGS INVESTIGATED

Battery

## CONFIGURATIONS INVESTIGATED

BOSN0057 - 1

## FREQUENCY RANGE INVESTIGATED

|                 |       |                |        |
|-----------------|-------|----------------|--------|
| Start Frequency | 9 kHz | Stop Frequency | 30 MHz |
|-----------------|-------|----------------|--------|

## 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 |
|------------------------------|---------------|----------------------|-----|-----------|----------|
| Cable                        | Northwest EMC | 10kHz-1GHz RE Cables | OCH | 3/3/2016  | 12 mo    |
| Antenna                      | EMCO          | 6502                 | AZB | 8/14/2015 | 24 mo    |
| Analyzer - Spectrum Analyzer | Agilent       | N9010A               | AFJ | 2/9/2016  | 12 mo    |

## MEASUREMENT BANDWIDTHS

| Frequency Range (MHz) | Peak Data (kHz) | Quasi-Peak Data (kHz) | Average Data (kHz) |
|-----------------------|-----------------|-----------------------|--------------------|
| 0.01 - 0.15           | 1.0             | 0.2                   | 0.2                |
| 0.15 - 30.0           | 10.0            | 9.0                   | 9.0                |
| 30.0 - 1000           | 100.0           | 120.0                 | 120.0              |
| Above 1000            | 1000.0          | N/A                   | 1000.0             |

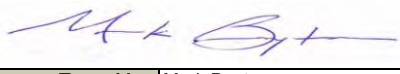
## TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

Per ANSI C63.10 sections 6.4.4.1 and 6.4.4.2, the emissions from the EUT were maximized by rotating the EUT on the turntable. Also, the EUT and/or associated antenna was positioned in 3 orthogonal planes. A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity per section 4.5.1. The center of the loop antenna was maintained at 1m above the ground plane during the testing.

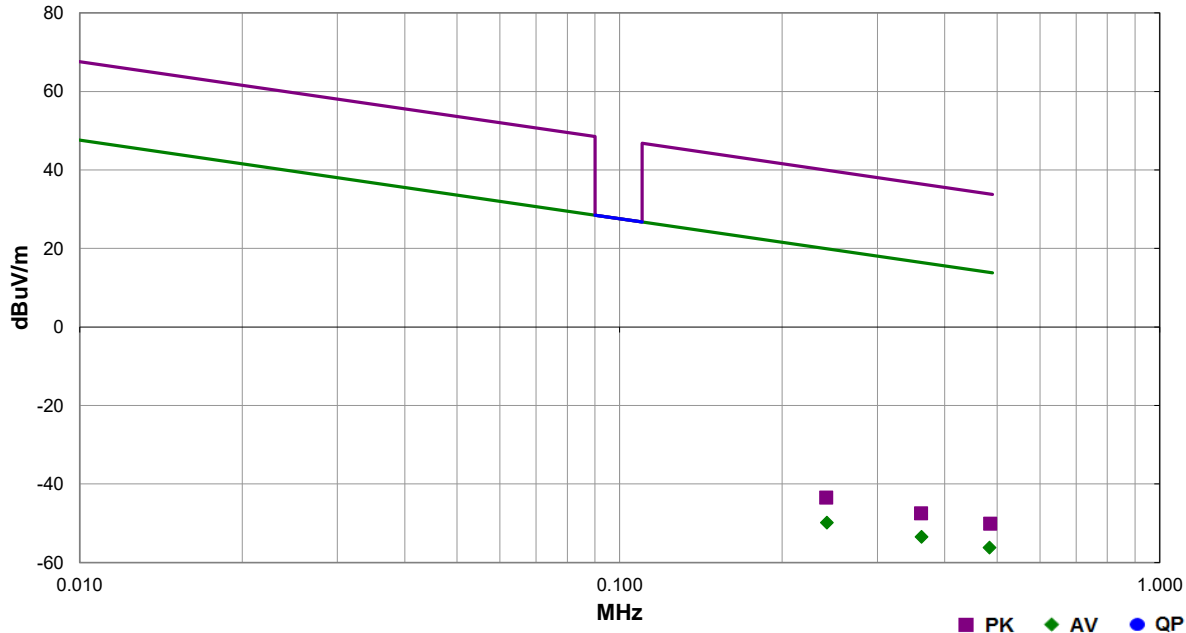
For measurements below 30 MHz, as outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit. Per FCC 15.33(a)(4), measurements were taken up to the highest frequency range of either the 10th harmonic of the fundamental or the applicable digital frequency test range.

If there are no detectable emissions above the noise floor, the data included will show noise floor measurements for reference only.

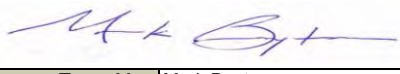
|                 |   |                   |           |  |
|-----------------|---|-------------------|-----------|--|
| Work Order:     | BOSN0057  | Date:             | 06/21/16  |  |
| Project:        | None  | Temperature:      | 23.4 °C   |  |
| Job Site:       | OC10  | Humidity:         | 49% RH    |  |
| Serial Number:  | 100112  | Barometric Pres.: | 1017 mbar |  |
| EUT:            | IPG Model SC-1140   |                   |           |  |
| Configuration:  | 1   |                   |           |  |
| Customer:       | Boston Scientific Neuromodulation                                 |                   |           |  |
| Attendees:      | Habet Ter-Petrosyan   |                   |           |  |
| EUT Power:      | Battery   |                   |           |  |
| Operating Mode: | Transmitting at 125kHz  |                   |           |  |
| Deviations:     | None  |                   |           |  |
| Comments:       | EUT was placed in a torso simulation filled with saline solution. |                   |           |  |

| Test Specifications | Test Method      |
|---------------------|------------------|
| FCC 15.209:2016     | ANSI C63.10:2013 |

| Run # | 10 | Test Distance (m) | 1 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|----|-------------------|---|-------------------|-----------|---------|------|
|-------|----|-------------------|---|-------------------|-----------|---------|------|

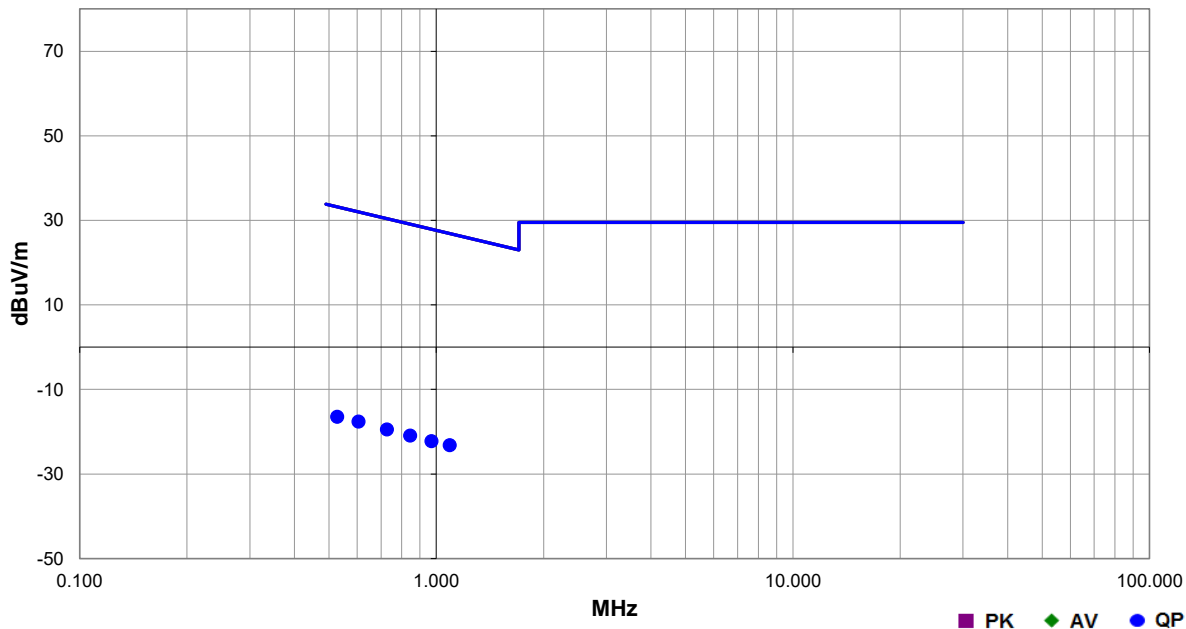


| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|----------|
| 0.242      | 39.1             | 10.1        | 2.2                     | 239.0             | 1.0                    | 0.0                       | Horz                      | AV       | -99.1                    | -49.9             | 19.9                 | -69.8                  |          |
| 0.362      | 35.5             | 10.1        | 1.0                     | 200.0             | 1.0                    | 0.0                       | Horz                      | AV       | -99.1                    | -53.5             | 16.4                 | -69.9                  |          |
| 0.484      | 32.6             | 10.3        | 1.0                     | 266.0             | 1.0                    | 0.0                       | Horz                      | AV       | -99.1                    | -56.2             | 13.9                 | -70.1                  |          |
| 0.241      | 45.5             | 10.1        | 2.2                     | 239.0             | 1.0                    | 0.0                       | Horz                      | PK       | -99.1                    | -43.5             | 40.0                 | -83.4                  |          |
| 0.362      | 41.5             | 10.1        | 1.0                     | 200.0             | 1.0                    | 0.0                       | Horz                      | PK       | -99.1                    | -47.5             | 36.4                 | -83.9                  |          |
| 0.485      | 38.7             | 10.3        | 1.0                     | 266.0             | 1.0                    | 0.0                       | Horz                      | PK       | -99.1                    | -50.1             | 33.9                 | -84.0                  |          |

|                 |   |                   |           |  |
|-----------------|---|-------------------|-----------|--|
| Work Order:     | BOSN0057  | Date:             | 06/21/16  |  |
| Project:        | None  | Temperature:      | 23.4 °C   |  |
| Job Site:       | OC10  | Humidity:         | 49% RH    |  |
| Serial Number:  | 100112  | Barometric Pres.: | 1017 mbar |  |
| EUT:            | IPG Model SC-1140   |                   |           |  |
| Configuration:  | 1   |                   |           |  |
| Customer:       | Boston Scientific Neuromodulation                                 |                   |           |  |
| Attendees:      | Habet Ter-Petrosyan   |                   |           |  |
| EUT Power:      | Battery   |                   |           |  |
| Operating Mode: | Transmitting at 125kHz  |                   |           |  |
| Deviations:     | None  |                   |           |  |
| Comments:       | EUT was placed in a torso simulation filled with saline solution. |                   |           |  |

| Test Specifications | Test Method      |
|---------------------|------------------|
| FCC 15.209:2016     | ANSI C63.10:2013 |

| Run # | 13 | Test Distance (m) | 1 | Antenna Height(s) | 1 to 4(m) | Results | Pass |
|-------|----|-------------------|---|-------------------|-----------|---------|------|
|-------|----|-------------------|---|-------------------|-----------|---------|------|



| 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 |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|----------|
| 0.605      | 31.1             | 10.4        | 1.0                     | 1.0               | 1.0                    | 0.0                       | Horz                      | QP       | -59.1                    | -17.6             | 32.0                 | -49.6                  |          |
| 0.528      | 32.3             | 10.3        | 1.0                     | 54.0              | 1.0                    | 0.0                       | Horz                      | QP       | -59.1                    | -16.4             | 33.2                 | -49.6                  |          |
| 0.727      | 29.2             | 10.4        | 1.0                     | 300.0             | 1.0                    | 0.0                       | Horz                      | QP       | -59.1                    | -19.5             | 30.4                 | -49.9                  |          |
| 0.845      | 27.7             | 10.4        | 1.0                     | 297.0             | 1.0                    | 0.0                       | Horz                      | QP       | -59.1                    | -20.9             | 29.1                 | -50.0                  |          |
| 1.091      | 25.1             | 10.8        | 2.4                     | 238.0             | 1.0                    | 0.0                       | Horz                      | QP       | -59.1                    | -23.2             | 26.9                 | -50.1                  |          |
| 0.969      | 26.2             | 10.6        | 1.0                     | 96.0              | 1.0                    | 0.0                       | Horz                      | QP       | -59.1                    | -22.2             | 27.9                 | -50.1                  |          |