

# Boston Scientific Neuromodulation

## Wand Model NM-7190

Report No. BOSN0010.4

Report Prepared By



[www.nwemc.com](http://www.nwemc.com)  
1-888-EMI-CERT

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EMC Test Report



22975 NW Evergreen Parkway  
Suite 400  
Hillsboro, Oregon 97124

**Certificate of Test**  
**Last Date of Test: May 24, 2011**  
**Boston Scientific Neuromodulation**  
**Model: NM-7190**

| Emissions                            |                 |                  |           |
|--------------------------------------|-----------------|------------------|-----------|
| Test Description                     | Specification   | Test Method      | Pass/Fail |
| Field Strength of Fundamental        | FCC 15.209:2011 | ANSI C63.10:2009 | Pass      |
| Field Strength of Spurious Emissions | FCC 15.209:2011 | ANSI C63.10:2009 | Pass      |
| AC Powerline Conducted Emissions     | FCC 15.207:2011 | ANSI C63.10:2009 | Pass      |

**Modifications made to the product**

**See the Modifications section of this report**

**Test Facility**

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.  
41 Tesla Ave.  
Irvine, CA 92618

Phone: (503) 844-4066      Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834B-1).

**Approved By:**

**Tim O'Shea, Operations Manager**



**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.*

*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. This Report may only be duplicated in its entirety. 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.*

| Revision Number | Description | Date | Page Number |
|-----------------|-------------|------|-------------|
| 00              | None        |      |             |

**Barometric Pressure**

The recorded barometric pressure has been normalized to sea level.



# Accreditations and Authorizations

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## FCC

Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

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## NVLAP

Northwest EMC, Inc. is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

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## Industry Canada

Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1*)

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## CAB

Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

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## Australia/New Zealand

The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).

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# Accreditations and Authorizations

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## VCCI

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. *(Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-1784, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634).*

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## BSMI

Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017).

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## GOST

Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

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## KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. *(Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175)*

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## VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

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## SCOPE

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

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



## Northwest EMC Locations



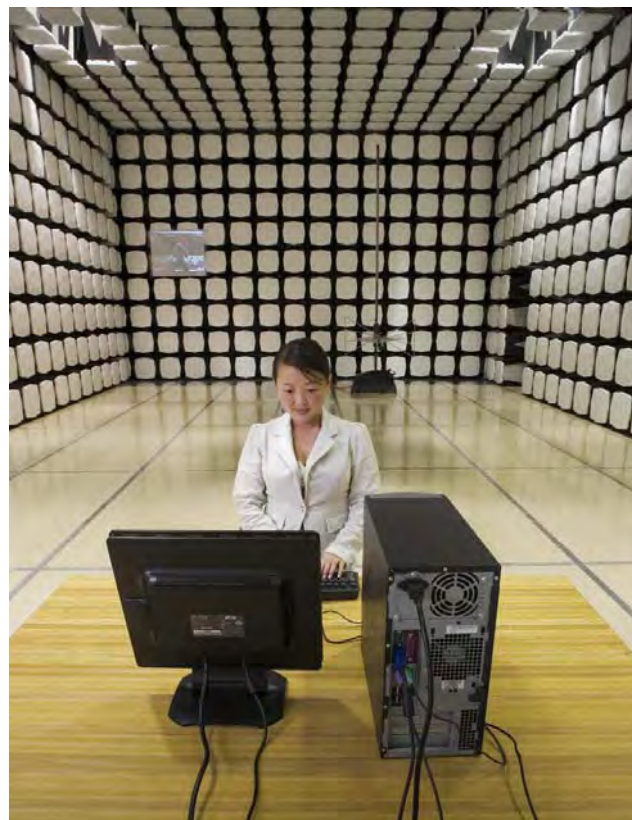
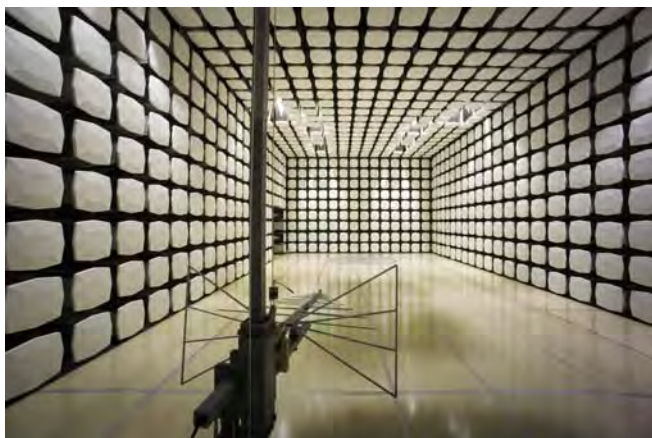
Oregon  
Labs EV01-EV12  
22975 NW Evergreen Pkwy  
Suite 400  
Hillsboro, OR 97124  
(503) 844-4066

California  
Labs OC01-OC13  
41 Tesla  
Irvine, CA 92618  
(949) 861-8918

Minnesota  
Labs MN01-MN08  
9349 W Broadway Ave.  
Brooklyn Park,  
MN 55445  
(763) 425-2281

Washington  
Labs SU01-SU07  
14128 339<sup>th</sup> Ave. SE  
Sultan, WA 98294  
(360) 793-8675

New York  
Labs WA01-WA04  
4939 Jordan Rd.  
Elbridge, NY 13060  
(315) 685-0796



## Party Requesting the Test

|                                 |                                   |
|---------------------------------|-----------------------------------|
| <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>       | Mizan Rahman                      |
| <b>Model:</b>                   | Wand Model SC-1132                |
| <b>First Date of Test:</b>      | 5/23/2011                         |
| <b>Last Date of Test:</b>       | 5/24/2011                         |
| <b>Receipt Date of Samples:</b> | 5/23/2011                         |
| <b>Equipment Design Stage:</b>  | Production                        |
| <b>Equipment Condition:</b>     | No Damage                         |

## Information Provided by the Party Requesting the Test

**Functional Description of the EUT (Equipment Under Test):**

A Clinician's Programmer (CP) and Wand combination are used by the clinicians or field representative to program the patient's stimulators. The CP is an off-the-shelf laptop computer used to communicate with the stimulators via the Wand.

**Testing Objective:**

To demonstrate compliance to FCC requirements.

**CONFIGURATION 2 BOSN0010**

| <b>EUT</b>         |                     |                                       |                      |
|--------------------|---------------------|---------------------------------------|----------------------|
| <b>Description</b> | <b>Manufacturer</b> | <b>Model/Part Number</b>              | <b>Serial Number</b> |
| ETS                | Boston Scientific   | SC-5132/ M365SC51320/<br>7096011-001  | 100068               |
| Wand               | Boston Scientific   | NM-7190/ M365NM71900A/<br>7095858-002 | 100233               |

| <b>Peripherals in test setup boundary</b> |                     |                          |                      |
|-------------------------------------------|---------------------|--------------------------|----------------------|
| <b>Description</b>                        | <b>Manufacturer</b> | <b>Model/Part Number</b> | <b>Serial Number</b> |
| Laptop                                    | Toshiba             | Protege                  | BA152613             |
| AC/DC Power Supply                        | Toshiba             | PA3182U-1ACA             | G71C0002SB101        |

| <b>Cables</b>                                                                                                 |               |                   |                |                     |                     |
|---------------------------------------------------------------------------------------------------------------|---------------|-------------------|----------------|---------------------|---------------------|
| <b>Cable Type</b>                                                                                             | <b>Shield</b> | <b>Length (m)</b> | <b>Ferrite</b> | <b>Connection 1</b> | <b>Connection 2</b> |
| OR Cable                                                                                                      | No            | 1m                | No             | ETS                 | Leads               |
| Leads (1)                                                                                                     | No            | .5m               | No             | OR Cable            | 8x365 Ohm           |
| Leads (2)                                                                                                     | No            | .5m               | No             | OR Cable            | 8x365 Ohm           |
| Wand Cable                                                                                                    | Yes           | 1.6m              | No             | Laptop              | Wand                |
| DC Cable                                                                                                      | Yes           | 1.2m              | No             | Laptop              | AC/DC Power Supply  |
| AC Cable                                                                                                      | No            | 1.8m              | No             | AC/DC Power Supply  | AC Mains            |
| <b>PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.</b> |               |                   |                |                     |                     |

| Equipment modifications |           |                                      |                                      |                                                                     |                                                   |
|-------------------------|-----------|--------------------------------------|--------------------------------------|---------------------------------------------------------------------|---------------------------------------------------|
| Item                    | Date      | Test                                 | Modification                         | Note                                                                | Disposition of EUT                                |
| 1                       | 5/24/2011 | 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                       | 5/24/2011 | Field Strength of Spurious 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. |
| 3                       | 5/24/2011 | AC Powerline Conducted 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.

#### MODES OF OPERATION

Transmitting at 125 kHz

#### POWER SETTINGS INVESTIGATED

120VAC/60Hz

#### AXIS INVESTIGATED

X-Axis

Y-Axis

Z-Axis

#### 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 |
|-------------------|--------------|----------------------|-----|-----------|----------|
| Antenna, Loop     | EMCO         | 6502                 | AZB | 12/6/2010 | 24       |
| OC10 Cables       | N/A          | 10kHz-1GHz RE Cables | OCH | 4/1/2010  | 15       |
| Spectrum Analyzer | Agilent      | E4446A               | AAY | 1/11/2011 | 12       |

#### MEASUREMENT BANDWIDTHS

|  | Frequency Range | Peak Data | Quasi-Peak Data | Average Data |
|--|-----------------|-----------|-----------------|--------------|
|  | (MHz)           | (kHz)     | (kHz)           | (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       |

Measurements were made using the bandwidths and detectors specified. No video filter was used.

#### MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

#### TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the transmitting channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009).

|                                             |                          |
|---------------------------------------------|--------------------------|
| EUT: Wand, Model NM-7190                    | Work Order: BOSN0010     |
| Serial Number: 100233                       | Date: 05/24/11           |
| Customer: Boston Scientific Neuromodulation | Temperature: 20.3        |
| Attendees: Mizan Rahman                     | Humidity: 52%            |
| Project: None                               | Barometric Pres.: 1014.4 |
| Tested by: Jaemi Suh                        | Power: 120VAC/60Hz       |
|                                             | Job Site: OC10           |

## TEST SPECIFICATIONS

FCC 15.209:2011

## TEST METHOD

ANSI C63.10:2009

## TEST PARAMETERS

|                       |          |                   |   |
|-----------------------|----------|-------------------|---|
| Antenna Height(s) (m) | 1 - 2.75 | Test Distance (m) | 3 |
|-----------------------|----------|-------------------|---|

## COMMENTS

Wand and ETS

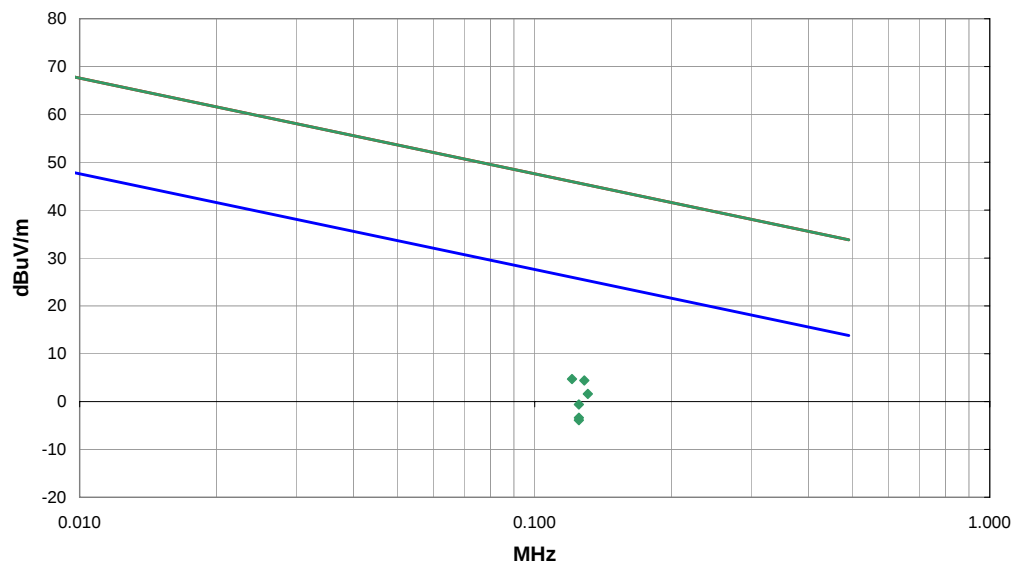
## EUT OPERATING MODES

Transmitting at 125 kHz

## DEVIATIONS FROM TEST STANDARD

No deviations.

|                 |      |                                                                                             |
|-----------------|------|---------------------------------------------------------------------------------------------|
| Run #           | 4    | Signature  |
| Configuration # | 2    |                                                                                             |
| Results         | Pass |                                                                                             |



| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Azimuth (degrees) | Height (meters) | Distance (meters) | External Attenuation (dB) | Polarity | Detector | Distance Adjustment (dB) | Adjusted dBuV/m | Spec. Limit dBuV/m | Compared to Spec. (dB) | Comments                                   |
|------------|------------------|-------------|-------------------|-----------------|-------------------|---------------------------|----------|----------|--------------------------|-----------------|--------------------|------------------------|--------------------------------------------|
| 0.125      | 68.9             | 10.5        | 296.0             | 1.0             | 3.0               | 0.0                       | Loop     | AV       | -80.0                    | -0.6            | 25.7               | -26.3                  | Antenna parallel to grnd, parallel to eut. |
| 0.125      | 66.1             | 10.5        | 283.0             | 1.0             | 3.0               | 0.0                       | Loop     | AV       | -80.0                    | -3.4            | 25.7               | -29.1                  | Antenna parallel to grnd, perp to eut.     |
| 0.125      | 65.6             | 10.5        | 292.0             | 1.0             | 3.0               | 0.0                       | Loop     | AV       | -80.0                    | -3.9            | 25.7               | -29.6                  | Antenna perp to ground, perp to eut.       |
| 0.129      | 73.9             | 10.5        | 296.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -80.0                    | 4.4             | 45.4               | -41.0                  | Antenna parallel to grnd, parallel to eut. |
| 0.121      | 74.2             | 10.5        | 283.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -80.0                    | 4.7             | 46.0               | -41.3                  | Antenna parallel to grnd, perp to eut.     |
| 0.131      | 71.1             | 10.5        | 291.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -80.0                    | 1.6             | 45.3               | -43.7                  | Antenna perp to ground, perp to eut        |

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.

#### MODES OF OPERATION

Transmitting at 125 kHz

#### POWER SETTINGS INVESTIGATED

120VAC/60Hz

#### AXIS INVESTIGATED

X-Axis

Y-Axis

Z-Axis

#### 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 |
|-------------------|--------------|----------------------|-----|-----------|----------|
| Antenna, Loop     | EMCO         | 6502                 | AZB | 12/6/2010 | 24       |
| OC10 Cables       | N/A          | 10kHz-1GHz RE Cables | OCH | 4/1/2010  | 15       |
| Spectrum Analyzer | Agilent      | E4446A               | AAY | 1/11/2011 | 12       |

#### MEASUREMENT BANDWIDTHS

|  | Frequency Range | Peak Data | Quasi-Peak Data | Average Data |
|--|-----------------|-----------|-----------------|--------------|
|  | (MHz)           | (kHz)     | (kHz)           | (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       |

Measurements were made using the bandwidths and detectors specified. No video filter was used.

#### MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

#### TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the transmitting channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009).

NORTHWEST

EMC

FIELD STRENGTH OF SPURIOUS EMISSIONS

PSA 2011.05.11  
EMI 2010.9.21

|                |                                   |                   |             |
|----------------|-----------------------------------|-------------------|-------------|
| EUT:           | Wand, Model NM-7190               | Work Order:       | BOSN0010    |
| Serial Number: | 100233                            | Date:             | 05/23/11    |
| Customer:      | Boston Scientific Neuromodulation | Temperature:      | 20.3        |
| Attendees:     | Mizan Rahman                      | Humidity:         | 52%         |
| Project:       | None                              | Barometric Pres.: | 1014.4      |
| Tested by:     | Jaemi Suh                         | Power:            | 120VAC/60Hz |
|                |                                   | Job Site:         | OC10        |

TEST SPECIFICATIONS

FCC 15.209:2011

TEST METHOD

ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m)

1 - 2.75

Test Distance (m)

3

COMMENTS

Wand and ETS. X-Axis

EUT OPERATING MODES

Transmitting at 125 kHz

DEVIATIONS FROM TEST STANDARD

No deviations.

|                 |      |                                                                                             |
|-----------------|------|---------------------------------------------------------------------------------------------|
| Run #           | 3    | Signature  |
| Configuration # | 2    |                                                                                             |
| Results         | Pass |                                                                                             |

dBuV/m

80

60

40

20

0

-20

-40

0.001

0.010

0.100

1.000

MHz

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Azimuth (degrees) | Height (meters) | Distance (meters) | External Attenuation (dB) | Polarity | Detector | Distance Adjustment (dB) | Adjusted dBuV/m | Spec. Limit dBuV/m | Compared to Spec. (dB) | Comments                                       |
|------------|------------------|-------------|-------------------|-----------------|-------------------|---------------------------|----------|----------|--------------------------|-----------------|--------------------|------------------------|------------------------------------------------|
| 0.375      | 40.6             | 10.3        | 358.0             | 1.0             | 3.0               | 0.0                       | Loop     | AV       | -80.0                    | -29.1           | 16.1               | -45.2                  | Antenna perp to grnd, EUT parallel to grnd     |
| 0.250      | 41.8             | 10.4        | 339.0             | 1.0             | 3.0               | 0.0                       | Loop     | AV       | -80.0                    | -27.8           | 19.6               | -47.4                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.375      | 38.2             | 10.3        | 322.0             | 1.0             | 3.0               | 0.0                       | Loop     | AV       | -80.0                    | -31.5           | 16.1               | -47.6                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.250      | 34.4             | 10.4        | 357.0             | 1.0             | 3.0               | 0.0                       | Loop     | AV       | -80.0                    | -35.2           | 19.6               | -54.8                  | Antenna perp to grnd, EUT parallel to grnd     |

NORTHWEST

EMC

FIELD STRENGTH OF SPURIOUS EMISSIONS

PSA 2011.05.11  
EMI 2010.9.21

|                                             |  |                          |  |
|---------------------------------------------|--|--------------------------|--|
| EUT: Wand, Model NM-7190                    |  | Work Order: BOSN0010     |  |
| Serial Number: 100233                       |  | Date: 05/23/11           |  |
| Customer: Boston Scientific Neuromodulation |  | Temperature: 20.3        |  |
| Attendees: Mizan Rahman                     |  | Humidity: 52%            |  |
| Project: None                               |  | Barometric Pres.: 1014.4 |  |
| Tested by: Jaemi Suh                        |  | Power: 120VAC/60Hz       |  |
|                                             |  | Job Site: OC10           |  |

TEST SPECIFICATIONS

FCC 15.209:2011

TEST METHOD

ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m)1 - 2.75Test Distance (m)3

COMMENTS

Wand and ETS. X-Axis

EUT OPERATING MODES

Transmitting at 125 kHz

DEVIATIONS FROM TEST STANDARD

No deviations.

|                 |      |                                                                                             |
|-----------------|------|---------------------------------------------------------------------------------------------|
| Run #           | 3    | Signature  |
| Configuration # | 2    |                                                                                             |
| Results         | Pass |                                                                                             |

dBuV/m

50

40

30

20

10

0

-10

-20

0.100

1.000

10.000

100.000

MHz

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Azimuth (degrees) | Height (meters) | Distance (meters) | External Attenuation (dB) | Polarity | Detector | Distance Adjustment (dB) | Adjusted dBuV/m | Spec. Limit dBuV/m | Compared to Spec. (dB) | Comments                                       |
|------------|------------------|-------------|-------------------|-----------------|-------------------|---------------------------|----------|----------|--------------------------|-----------------|--------------------|------------------------|------------------------------------------------|
| 0.496      | 38.8             | 10.3        | 194.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 9.1             | 33.7               | -24.6                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.499      | 38.7             | 10.3        | 359.0             | 2.1             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 9.0             | 33.6               | -24.6                  | Antenna perp to grnd, EUT parallel to grnd     |
| 0.501      | 38.1             | 10.3        | 25.0              | 2.1             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 8.4             | 33.6               | -25.2                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.623      | 36.2             | 10.3        | 154.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 6.5             | 31.7               | -25.2                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.496      | 37.9             | 10.3        | 357.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 8.2             | 33.7               | -25.5                  | Antenna perp to grnd, EUT perp to grnd         |
| 0.745      | 34.3             | 10.3        | 329.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 4.6             | 30.2               | -25.6                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.754      | 34.1             | 10.3        | 356.0             | 3.6             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 4.4             | 30.1               | -25.7                  | Antenna perp to grnd, EUT parallel to grnd     |
| 0.624      | 35.5             | 10.3        | 356.0             | 1.0             | 3.0               | 0.0                       | Loop     | PK       | -40.0                    | 5.8             | 31.7               | -25.9                  | Antenna perp to grnd, EUT parallel to grnd     |
| 0.499      | 32.8             | 10.3        | 357.0             | 1.0             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | 3.1             | 33.6               | -30.5                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.626      | 30.8             | 10.3        | 154.0             | 1.0             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | 1.1             | 31.7               | -30.6                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.502      | 32.7             | 10.3        | 25.0              | 2.1             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | 3.0             | 33.6               | -30.6                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.496      | 32.8             | 10.3        | 194.0             | 1.0             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | 3.1             | 33.7               | -30.6                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.619      | 30.8             | 10.3        | 356.0             | 1.0             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | 1.1             | 31.8               | -30.7                  | Antenna perp to grnd, EUT parallel to grnd     |
| 0.502      | 32.6             | 10.3        | 359.0             | 2.1             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | 2.9             | 33.6               | -30.7                  | Antenna perp to grnd, EUT parallel to grnd     |
| 0.747      | 28.9             | 10.3        | 329.0             | 1.0             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | -0.8            | 30.1               | -30.9                  | Antenna parallel to grnd, EUT parallel to grnd |
| 0.754      | 28.8             | 10.3        | 356.0             | 3.6             | 3.0               | 0.0                       | Loop     | QP       | -40.0                    | -0.9            | 30.1               | -31.0                  | Antenna perp to grnd, EUT parallel to grnd     |

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.

#### MODES OF OPERATION

Transmitting at 125 kHz

#### POWER SETTINGS INVESTIGATED

120VAC/60Hz

#### CONFIGURATIONS INVESTIGATED

BOSN0010 - 2

#### SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

#### TEST EQUIPMENT

| Description      | Manufacturer    | Model            | ID  | Last Cal. | Interval |
|------------------|-----------------|------------------|-----|-----------|----------|
| LISN             | Solar           | 9252-50-24-BNC   | LIA | 6/14/2010 | 12 mo    |
| Attenuator       | Pasternack      | 6N10W-20         | AWC | 3/2/2011  | 12 mo    |
| High Pass Filter | TTE             | H97-100K-50-720B | HFP | 3/8/2010  | 24 mo    |
| OC06 Cables      | N/A             | CE Cables        | OCM | 4/7/2011  | 12 mo    |
| Receiver         | Rohde & Schwarz | ESCI             | ARF | 4/1/2011  | 12 mo    |

#### MEASUREMENT BANDWIDTHS

| Frequency Range | Peak Data | Quasi-Peak Data | Average Data |
|-----------------|-----------|-----------------|--------------|
| (MHz)           | (kHz)     | (kHz)           | (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       |

Measurements were made using the bandwidths and detectors specified. No video filter was used.

#### MEASUREMENT UNCERTAINTY

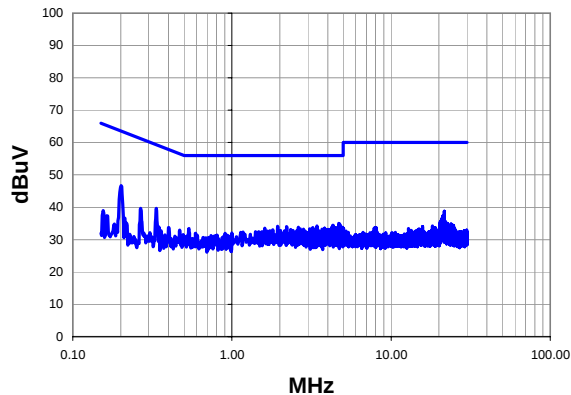
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

#### TEST DESCRIPTION

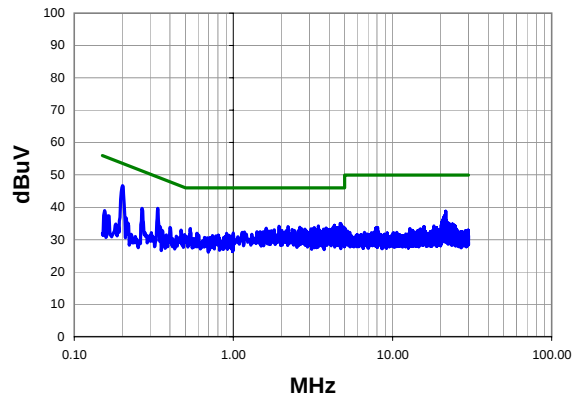
Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm.

|                                               |                                   |                          |           |                                                                                     |    |                |      |
|-----------------------------------------------|-----------------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|----|----------------|------|
| <b>Work Order:</b>                            | BOSN0010                          | <b>Date:</b>             | 05/24/11  |  |    |                |      |
| <b>Project:</b>                               | None                              | <b>Temperature:</b>      | 20.3      |                                                                                     |    |                |      |
| <b>Job Site:</b>                              | OC06                              | <b>Humidity:</b>         | 52        |                                                                                     |    |                |      |
| <b>Serial Number:</b>                         | 100233                            | <b>Barometric Pres.:</b> | 1014.4    |                                                                                     |    |                |      |
| <b>EUT:</b>                                   | Wand, Model NM-7190               |                          |           |                                                                                     |    |                |      |
| <b>Configuration:</b>                         | 2                                 |                          |           |                                                                                     |    |                |      |
| <b>Customer:</b>                              | Boston Scientific Neuromodulation |                          |           |                                                                                     |    |                |      |
| <b>Attendees:</b>                             | Mizan Rahman                      |                          |           |                                                                                     |    |                |      |
| <b>EUT Power:</b>                             | 120VAC/60Hz                       |                          |           |                                                                                     |    |                |      |
| <b>Operating Mode:</b>                        | Transmitting at 125 kHz           |                          |           |                                                                                     |    |                |      |
| <b>Deviations:</b>                            | None                              |                          |           |                                                                                     |    |                |      |
| <b>Comments:</b>                              | Wand and ETS                      |                          |           |                                                                                     |    |                |      |
| <b>Test Specifications</b><br>FCC 15.207:2011 |                                   | <b>Class B</b>           |           | <b>Test Method</b><br>ANSI C63.10:2009                                              |    |                |      |
| <b>Run #</b>                                  | 1                                 | <b>Line:</b>             | High Line | <b>Ext. Attenuation:</b>                                                            | 20 | <b>Results</b> | Pass |

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

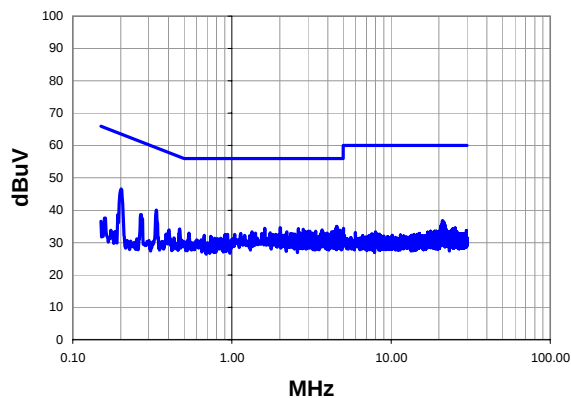
| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|------------|------------------|-------------|-----------------|--------------------|------------------------|
| 0.201      | 25.4             | 21.3        | 46.7            | 63.6               | -16.9                  |
| 0.335      | 19.0             | 20.7        | 39.7            | 59.3               | -19.6                  |
| 4.696      | 14.5             | 20.5        | 35.0            | 56.0               | -21.0                  |
| 21.570     | 17.9             | 20.9        | 38.8            | 60.0               | -21.2                  |
| 4.760      | 14.3             | 20.5        | 34.8            | 56.0               | -21.2                  |
| 0.267      | 18.8             | 20.9        | 39.7            | 61.2               | -21.5                  |
| 4.312      | 13.9             | 20.5        | 34.4            | 56.0               | -21.6                  |
| 3.424      | 13.7             | 20.5        | 34.2            | 56.0               | -21.8                  |
| 1.936      | 13.6             | 20.5        | 34.1            | 56.0               | -21.9                  |
| 4.832      | 13.6             | 20.5        | 34.1            | 56.0               | -21.9                  |
| 2.208      | 13.5             | 20.5        | 34.0            | 56.0               | -22.0                  |
| 2.616      | 13.3             | 20.5        | 33.8            | 56.0               | -22.2                  |
| 4.224      | 13.3             | 20.5        | 33.8            | 56.0               | -22.2                  |
| 3.216      | 13.2             | 20.5        | 33.7            | 56.0               | -22.3                  |
| 4.424      | 13.2             | 20.5        | 33.7            | 56.0               | -22.3                  |
| 4.912      | 13.2             | 20.5        | 33.7            | 56.0               | -22.3                  |
| 4.960      | 13.2             | 20.5        | 33.7            | 56.0               | -22.3                  |
| 1.608      | 13.0             | 20.5        | 33.5            | 56.0               | -22.5                  |
| 3.824      | 13.0             | 20.5        | 33.5            | 56.0               | -22.5                  |
| 4.360      | 13.0             | 20.5        | 33.5            | 56.0               | -22.5                  |

Peak Data - vs - Average Limit

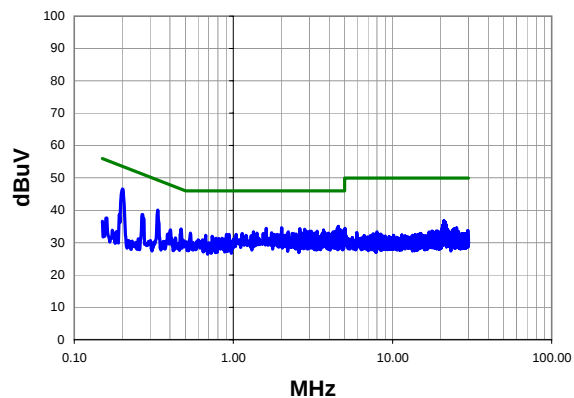
| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|------------|------------------|-------------|-----------------|--------------------|------------------------|
| 0.201      | 25.4             | 21.3        | 46.7            | 53.6               | -6.9                   |
| 0.335      | 19.0             | 20.7        | 39.7            | 49.3               | -9.6                   |
| 4.696      | 14.5             | 20.5        | 35.0            | 46.0               | -11.0                  |
| 21.570     | 17.9             | 20.9        | 38.8            | 50.0               | -11.2                  |
| 4.760      | 14.3             | 20.5        | 34.8            | 46.0               | -11.2                  |
| 0.267      | 18.8             | 20.9        | 39.7            | 51.2               | -11.5                  |
| 4.312      | 13.9             | 20.5        | 34.4            | 46.0               | -11.6                  |
| 3.424      | 13.7             | 20.5        | 34.2            | 46.0               | -11.8                  |
| 1.936      | 13.6             | 20.5        | 34.1            | 46.0               | -11.9                  |
| 4.832      | 13.6             | 20.5        | 34.1            | 46.0               | -11.9                  |
| 2.208      | 13.5             | 20.5        | 34.0            | 46.0               | -12.0                  |
| 2.616      | 13.3             | 20.5        | 33.8            | 46.0               | -12.2                  |
| 4.224      | 13.3             | 20.5        | 33.8            | 46.0               | -12.2                  |
| 3.216      | 13.2             | 20.5        | 33.7            | 46.0               | -12.3                  |
| 4.424      | 13.2             | 20.5        | 33.7            | 46.0               | -12.3                  |
| 4.912      | 13.2             | 20.5        | 33.7            | 46.0               | -12.3                  |
| 4.960      | 13.2             | 20.5        | 33.7            | 46.0               | -12.3                  |
| 1.608      | 13.0             | 20.5        | 33.5            | 46.0               | -12.5                  |
| 3.824      | 13.0             | 20.5        | 33.5            | 46.0               | -12.5                  |
| 4.360      | 13.0             | 20.5        | 33.5            | 46.0               | -12.5                  |

|                                               |                                   |                          |          |                                                                                     |                     |
|-----------------------------------------------|-----------------------------------|--------------------------|----------|-------------------------------------------------------------------------------------|---------------------|
| <b>Work Order:</b>                            | BOSN0010                          | <b>Date:</b>             | 05/24/11 |  |                     |
| <b>Project:</b>                               | None                              | <b>Temperature:</b>      | 20.3     |                                                                                     |                     |
| <b>Job Site:</b>                              | OC06                              | <b>Humidity:</b>         | 52       |                                                                                     |                     |
| <b>Serial Number:</b>                         | 100233                            | <b>Barometric Pres.:</b> | 1014.4   |                                                                                     |                     |
| <b>EUT:</b>                                   | Wand, Model NM-7190               |                          |          |                                                                                     |                     |
| <b>Configuration:</b>                         | 2                                 |                          |          |                                                                                     |                     |
| <b>Customer:</b>                              | Boston Scientific Neuromodulation |                          |          |                                                                                     |                     |
| <b>Attendees:</b>                             | Mizan Rahman                      |                          |          |                                                                                     |                     |
| <b>EUT Power:</b>                             | 120VAC/60Hz                       |                          |          |                                                                                     |                     |
| <b>Operating Mode:</b>                        | Transmitting at 125 kHz           |                          |          |                                                                                     |                     |
| <b>Deviations:</b>                            | None                              |                          |          |                                                                                     |                     |
| <b>Comments:</b>                              | Wand and ETS                      |                          |          |                                                                                     |                     |
| <b>Test Specifications</b><br>FCC 15.207:2011 |                                   | <b>Class B</b>           |          | <b>Test Method</b><br>ANSI C63.10:2009                                              |                     |
| <b>Run #</b>                                  | 2                                 | <b>Line:</b>             | Neutral  | <b>Ext. Attenuation:</b> 20                                                         | <b>Results</b> Pass |

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|------------|------------------|-------------|-----------------|--------------------|------------------------|
| 0.201      | 25.3             | 21.3        | 46.6            | 63.6               | -17.0                  |
| 0.335      | 19.4             | 20.7        | 40.1            | 59.3               | -19.2                  |
| 4.560      | 14.5             | 20.5        | 35.0            | 56.0               | -21.0                  |
| 2.008      | 14.1             | 20.5        | 34.6            | 56.0               | -21.4                  |
| 1.608      | 13.9             | 20.5        | 34.4            | 56.0               | -21.6                  |
| 2.616      | 13.8             | 20.5        | 34.3            | 56.0               | -21.7                  |
| 4.496      | 13.8             | 20.5        | 34.3            | 56.0               | -21.7                  |
| 2.808      | 13.6             | 20.5        | 34.1            | 56.0               | -21.9                  |
| 4.624      | 13.6             | 20.5        | 34.1            | 56.0               | -21.9                  |
| 3.688      | 13.4             | 20.5        | 33.9            | 56.0               | -22.1                  |
| 4.768      | 13.3             | 20.5        | 33.8            | 56.0               | -22.2                  |
| 4.968      | 13.2             | 20.5        | 33.7            | 56.0               | -22.3                  |
| 0.470      | 13.6             | 20.6        | 34.2            | 56.5               | -22.3                  |
| 3.016      | 13.0             | 20.5        | 33.5            | 56.0               | -22.5                  |
| 3.088      | 13.0             | 20.5        | 33.5            | 56.0               | -22.5                  |
| 3.352      | 13.0             | 20.5        | 33.5            | 56.0               | -22.5                  |
| 0.267      | 17.8             | 20.9        | 38.7            | 61.2               | -22.5                  |
| 2.880      | 12.9             | 20.5        | 33.4            | 56.0               | -22.6                  |
| 1.336      | 12.8             | 20.5        | 33.3            | 56.0               | -22.7                  |
| 2.216      | 12.8             | 20.5        | 33.3            | 56.0               | -22.7                  |

Peak Data - vs - Average Limit

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Compared to Spec. (dB) |
|------------|------------------|-------------|-----------------|--------------------|------------------------|
| 0.201      | 25.3             | 21.3        | 46.6            | 53.6               | -7.0                   |
| 0.335      | 19.4             | 20.7        | 40.1            | 49.3               | -9.2                   |
| 4.560      | 14.5             | 20.5        | 35.0            | 46.0               | -11.0                  |
| 2.008      | 14.1             | 20.5        | 34.6            | 46.0               | -11.4                  |
| 1.608      | 13.9             | 20.5        | 34.4            | 46.0               | -11.6                  |
| 2.616      | 13.8             | 20.5        | 34.3            | 46.0               | -11.7                  |
| 4.496      | 13.8             | 20.5        | 34.3            | 46.0               | -11.7                  |
| 2.808      | 13.6             | 20.5        | 34.1            | 46.0               | -11.9                  |
| 4.624      | 13.6             | 20.5        | 34.1            | 46.0               | -11.9                  |
| 3.688      | 13.4             | 20.5        | 33.9            | 46.0               | -12.1                  |
| 4.768      | 13.3             | 20.5        | 33.8            | 46.0               | -12.2                  |
| 4.968      | 13.2             | 20.5        | 33.7            | 46.0               | -12.3                  |
| 0.470      | 13.6             | 20.6        | 34.2            | 46.5               | -12.3                  |
| 3.016      | 13.0             | 20.5        | 33.5            | 46.0               | -12.5                  |
| 3.088      | 13.0             | 20.5        | 33.5            | 46.0               | -12.5                  |
| 3.352      | 13.0             | 20.5        | 33.5            | 46.0               | -12.5                  |
| 0.267      | 17.8             | 20.9        | 38.7            | 51.2               | -12.5                  |
| 2.880      | 12.9             | 20.5        | 33.4            | 46.0               | -12.6                  |
| 1.336      | 12.8             | 20.5        | 33.3            | 46.0               | -12.7                  |
| 2.216      | 12.8             | 20.5        | 33.3            | 46.0               | -12.7                  |