

NORTHWEST EMC

Boston Scientific Corporation

Jaguar, Model 6290

FCC 95I:2015
FCC 15.207:2015

Report # BSTN0554



NVLAP Lab Code: 200881-0

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: March 23, 2015
Boston Scientific Corporation
Model: Jaguar, Model 6290

Radio Equipment Testing

Standards

Specification	Method
FCC 95.1:2015	ANSI/TIA/EIA-603-C-2004
FCC 15.207:2015	ANSI C63.10:2009

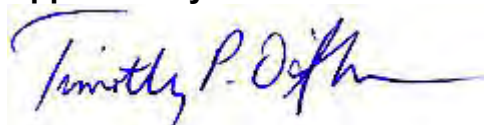
Results

Method Clause	Test Description	Applied	Results	Comments
FCC 95.627(a)	Frequency Monitoring	No	N/A	Not requested as the customer is responsible to handle this requirement.
FCC 95.633(e)(3)	Emission Bandwidth	Yes	Pass	
FCC 95.635(d)(4-5)	Emission Mask	Yes	Pass	
FCC 2.2.1	Output Power	Yes	Pass	
FCC 2.2.2	Frequency Stability	Yes	Pass	
FCC 2.2.12	Spurious Radiated Emissions	Yes	Pass	
FCC 2.2.13	Spurious Conducted Emissions	Yes	Pass	
FCC 2.2.17	Radiated Power (EIRP)	Yes	Pass	
ANSI C63.10 - 6.2	AC Powerline Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:



Tim O'Shea, 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.

REVISION HISTORY

Revision Number		Description	Date	Page Number
00		None		

ACCREDITATIONS AND AUTHORIZATIONS

United States

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

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

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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

<http://www.nwemc.com/accreditations/>
<http://gsi.nist.gov/global/docs/cabs/designations.html>

MEASUREMENT UNCERTAINTY

Measurement Uncertainty

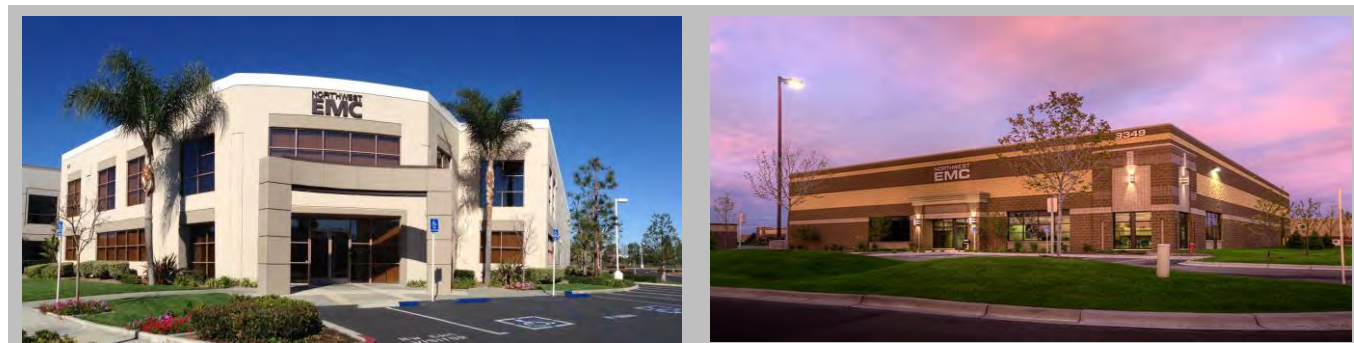
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement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

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. 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.

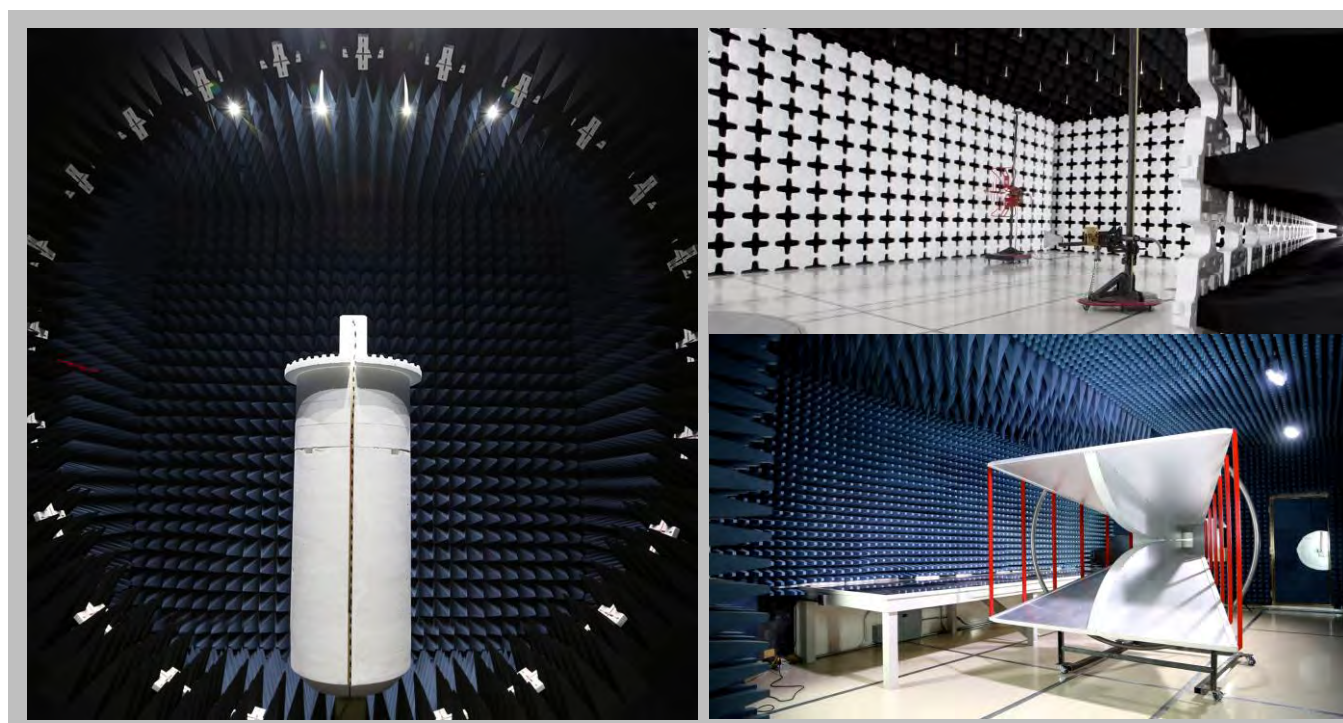
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.7 dB	-4.7 dB
AC Powerline Conducted Emissions (dB)	2.9 dB	-2.9 dB

FACILITIES



California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 9801 (425)984-6600
NVLAP					
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
Industry Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Boston Scientific Corporation
Address:	4100 Hamline Avenue North
City, State, Zip:	St. Paul, MN 55112
Test Requested By:	Pete Musto
Model:	Jaguar, Model 6290
First Date of Test:	March 17, 2015
Last Date of Test:	March 23, 2015
Receipt Date of Samples:	March 17, 2015
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
In home monitor that communicates with an implant through MedRadio band communications.
Testing Objective:
Seeking an FCC Class II Permissive Change for a modification to increase the power on the S-ICD channels.

CONFIGURATIONS

Configuration BSTN0554- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Communicator (Jaguar)	Boston Scientific Corporation	6290	601
DC Brick	GlobTek	GTM41061-1512-7.0	none

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
US Cellular Adapter	Boston Scientific Corporation	6295	5
US Bluetooth Adapter	Delta Mobile Systems	DM210	2E6B

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.80m	Yes	DC Brick	Communicator (Jaguar)
RJ11 (x2)	No	1.80m	No	Communicator (Jaguar)	Unterminated
USB Cable	Yes	0.20m	Yes	Communicator (Jaguar)	US Cellular Modem

Configuration BSTN0554- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Communicator (Jaguar)	Boston Scientific Corporation	6290	601
DC Brick	GlobTek	GTM41061-1512-7.0	none

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
US Cellular Adapter	Boston Scientific Corporation	6295	5
US Bluetooth Adapter	Delta Mobile Systems	DM210	2E6B

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.80m	Yes	DC Brick	Communicator (Jaguar)
RJ11 (x2)	No	1.80m	No	Communicator (Jaguar)	Unterminated
USB Cable	Yes	0.20m	Yes	Communicator (Jaguar)	US Cellular Modem
AC Power	No	1.80m	No	DC Brick	AC Mains

CONFIGURATIONS

Configuration BSTN0554- 3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Communicator (Jaguar)	Boston Scientific Corporation	6290	601
DC Brick	GlobTek	GTM41061-1512-7.0	None

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
US Cellular Adapter	Boston Scientific Corporation	6295	5
US Bluetooth Adapter	Delta Mobile Systems	DM210	2E6B
Laptop	Gateway	ZE7	LUWZMOD00120219DD97614
AC Adapter	Leader Electronics	IU40-11190-011S	AP04007002150069F8PP03

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.80m	Yes	DC Brick	Communicator (Jaguar)
RJ11 (x2)	No	1.80m	No	Communicator (Jaguar)	Unterminated
USB Cable	Yes	0.20m	Yes	Communicator (Jaguar)	US Cellular Modem
USB to Ribbon	No	1.90m	No	Laptop	Communicator (Jaguar)
DC Power	No	2.50m	Yes	Laptop	AC Adapter

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	3/17/2015	Equivalent Isotropic Radiated Power	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	3/20/2015	AC Powerline Conducted 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	3/20/2015	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	3/20/2015	Spurious Conducted 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.
5	3/20/2015	Conducted Output Power	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.
6	3/20/2015	Emissions Bandwidth	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.
7	3/20/2015	Emissions Mask	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.
8	3/23/2015	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

EMISSIONS BANDWIDTH

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	E4443A	AAS	3/27/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMI	10/2/2014	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	SM Electronics	SA26B-20	RFW	3/10/2015	12
Spectrum Analyzer	Agilent	E4440A	AAX	4/28/2014	12

TEST DESCRIPTION

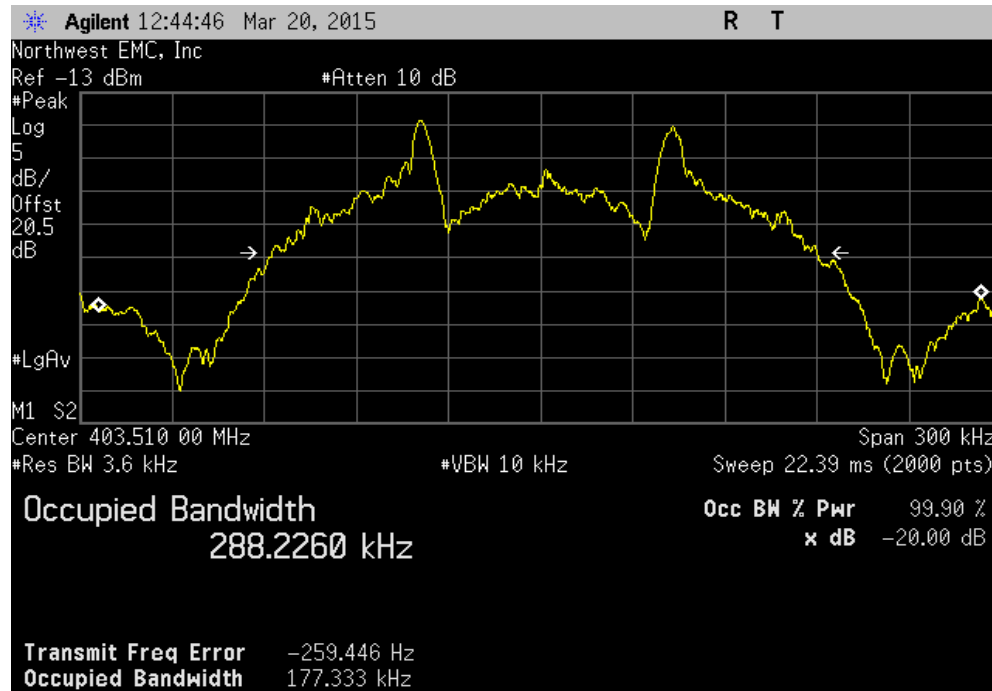
Per 47 CFR 95.633(e)(3), the emission bandwidth was determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 20 dB down relative to the maximum level of the modulated carrier. A spectrum analyzer using a peak detector with no video filtering was used with a resolution bandwidth equal to approximately 1.0 percent of the emission bandwidth of the EUT.

EMISSIONS BANDWIDTH

EUT: Jaguar, Model 6290		Work Order: BSTN0554	
Serial Number: 601		Date: 03/20/15	
Customer: Boston Scientific Corporation		Temperature: 22.8°C	
Attendees: None		Humidity: 23%	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer	Power: 110VAC/60Hz	Job Site: MN08	
TEST SPECIFICATIONS			
FCC 951:2015		Test Method: ANSI/TIA/EIA-603-C-2004	
COMMENTS			
US Power Setting = 51. Transmitting a modulated carrier at 76.8 kbps.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Trevor Buls</i>	
		Value	Limit (S)
403.51 MHz		177.333 kHz	300 kHz
			Result
			Pass

EMISSIONS BANDWIDTH

403.51 MHz						
				Value	Limit (S)	Result
				177.333 kHz	300 kHz	Pass



EMISSIONS MASK

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	E4443A	AAS	3/27/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMI	10/2/2014	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	SM Electronics	SA26B-20	RFW	3/10/2015	12
Spectrum Analyzer	Agilent	E4440A	AAX	4/28/2014	12

TEST DESCRIPTION

Per 47 CFR 95.635(d)(4) the emission mask was measured. Emissions more than 150 kHz away from the center frequency must be attenuated below the transmitter output power by at least 20 dB. This was evaluated by the Occupied Bandwidth measurement according to 47 CFR 95.633(e)(1). In addition, emissions 250 kHz or less above and below the MedRadio band (402-405 MHz) must be attenuated below the maximum permitted output power by at least 20 dB.

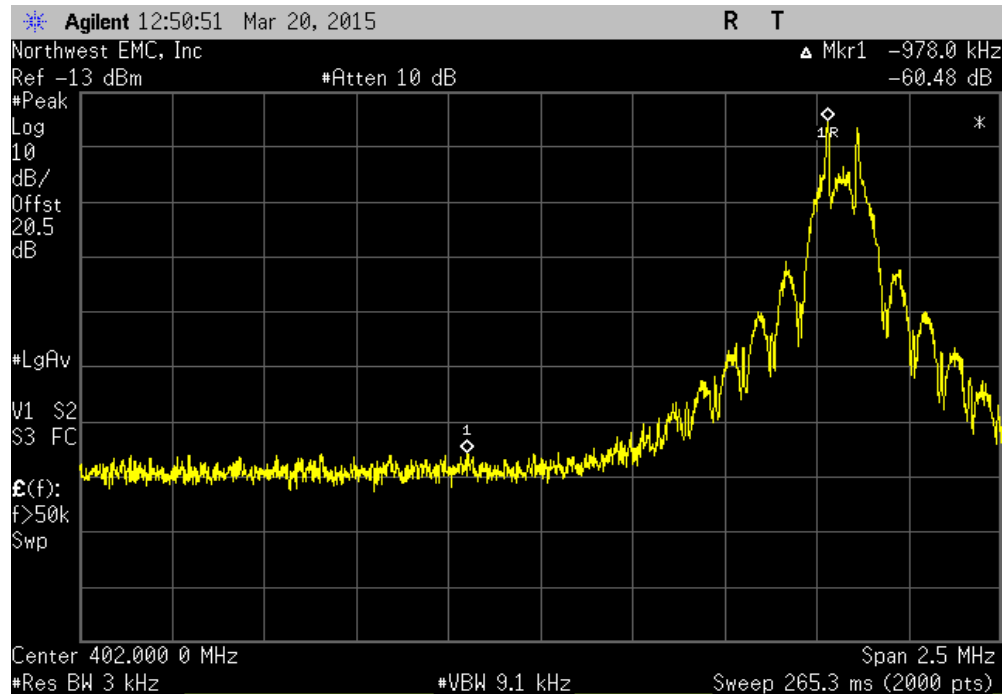
A spectrum analyzer was used to measure the emission mask. A spectrum analyzer using a peak detector with no video filtering was used with a resolution bandwidth equal to approximately 1.0 percent of the emission bandwidth of the EUT. However, various plots were made using different frequency spans and resolution bandwidths in an attempt to not only satisfy the measurement criteria, but to also show that all emissions outside of the occupied band are greatly attenuated.

EMISSIONS MASK

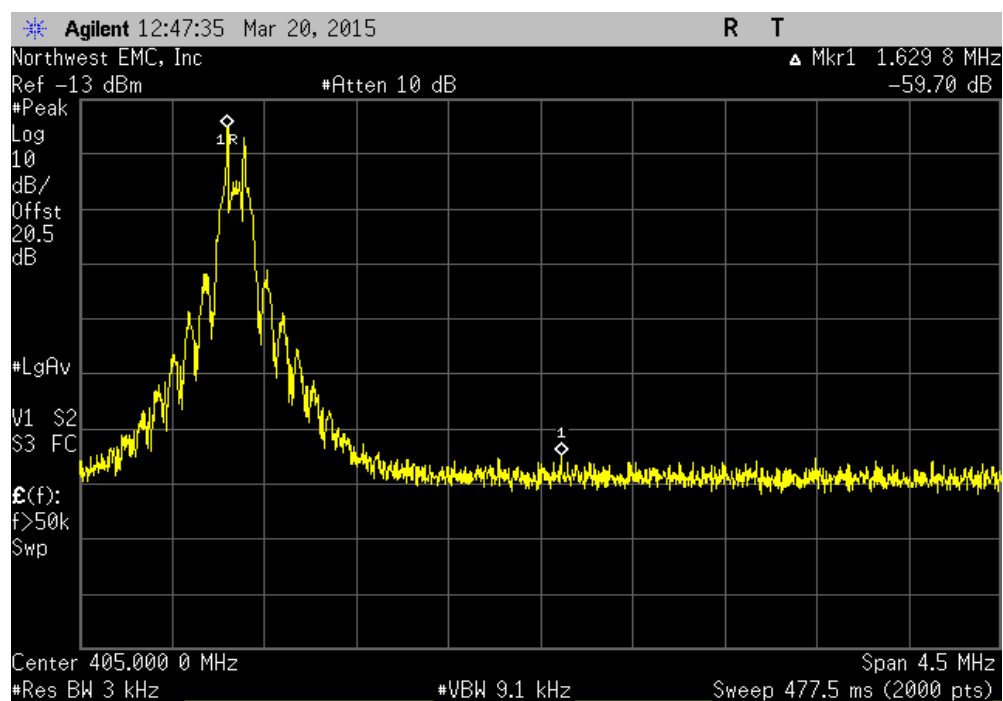
EUT: Jaguar, Model 6290		Work Order: BSTN0554	
Serial Number: 601		Date: 03/20/15	
Customer: Boston Scientific Corporation		Temperature: 22.8°C	
Attendees: None		Humidity: 23%	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer	Power: 110VAC/60Hz	Job Site: MN08	
TEST SPECIFICATIONS			
FCC 951:2015		Test Method: ANSI/TIA/EIA-603-C-2004	
COMMENTS			
US Power Setting = 51. Transmitting a modulated carrier at 76.8 kbps.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature: <i>Trevor Buls</i>	
		Value (dBc)	Limit ≤ (dBc) Result
Lower Channel, 402.81 MHz		-60.48	-20 Pass
Higher Channel, 403.51 MHz		-59.7	-20 Pass

EMISSIONS MASK

Lower Channel, 402.81 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-60.48	-20	Pass



Higher Channel, 403.51 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.7	-20	Pass



CONDUCTED OUTPUT POWER

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	E4443A	AAS	3/27/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMI	10/2/2014	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	SM Electronics	SA26B-20	RFW	3/10/2015	12
Spectrum Analyzer	Agilent	E4440A	AAX	4/28/2014	12

TEST DESCRIPTION

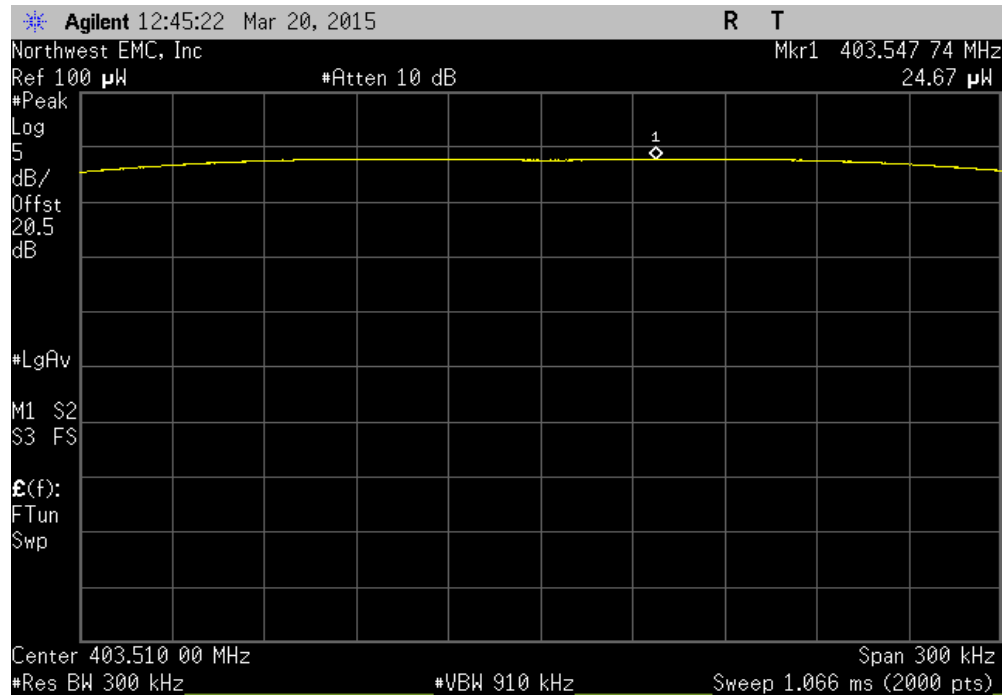
Per FCC Part 2.1046, RSS-GEN, the output power shall be measured at the RF terminal. The peak output power was measured with the EUT configured in the modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate. FCC Part 95 and RSS-243 have no conducted output power limit. It is a requirement to characterize this information and that data is contained within this datasheet.

CONDUCTED OUTPUT POWER

EUT: Jaguar, Model 6290		Work Order: BSTN0554	
Serial Number: 601		Date: 03/20/15	
Customer: Boston Scientific Corporation		Temperature: 22.8°C	
Attendees: None		Humidity: 23%	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer	Power: 110VAC/60Hz	Job Site: MN08	
TEST SPECIFICATIONS			
FCC 951:2015		Test Method	
		ANSI/TIA/EIA-603-C-2004	
COMMENTS			
US Power Setting = 51. Transmitting a modulated carrier at 76.8 kbps.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Trevor Bule</i>	
		Value	Limit
403.51 MHz		24.672 uW	N/A
			Result
			N/A

CONDUCTED OUTPUT POWER

403.51 MHz						
				Value	Limit	Result
				24.672 uW	N/A	N/A



FREQUENCY STABILITY

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
40 GHz DC Block	Fairview Microwave	SD3379	AMI	10/2/2014	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	SM Electronics	SA26B-20	RFW	3/10/2015	12
Spectrum Analyzer	Agilent	E4440A	AAX	4/28/2014	12
Variable Transformer	Powerstat	246	XFR	NCR	0
Multimeter	Fluke	117	MLS	1/20/2014	36
Thermometer	Omega Engineering, Inc.	HH311	DUB	11/3/2014	36
Humidity Temperature Chamber	Cincinnati Sub Zero (CSZ)	ZPH-32-3.5-SCT/AC	TBF	NCR	0

TEST DESCRIPTION

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of the nominal voltage. A DC lab supply was used to vary the supply voltage.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (+25°, 37°C and +45° C).

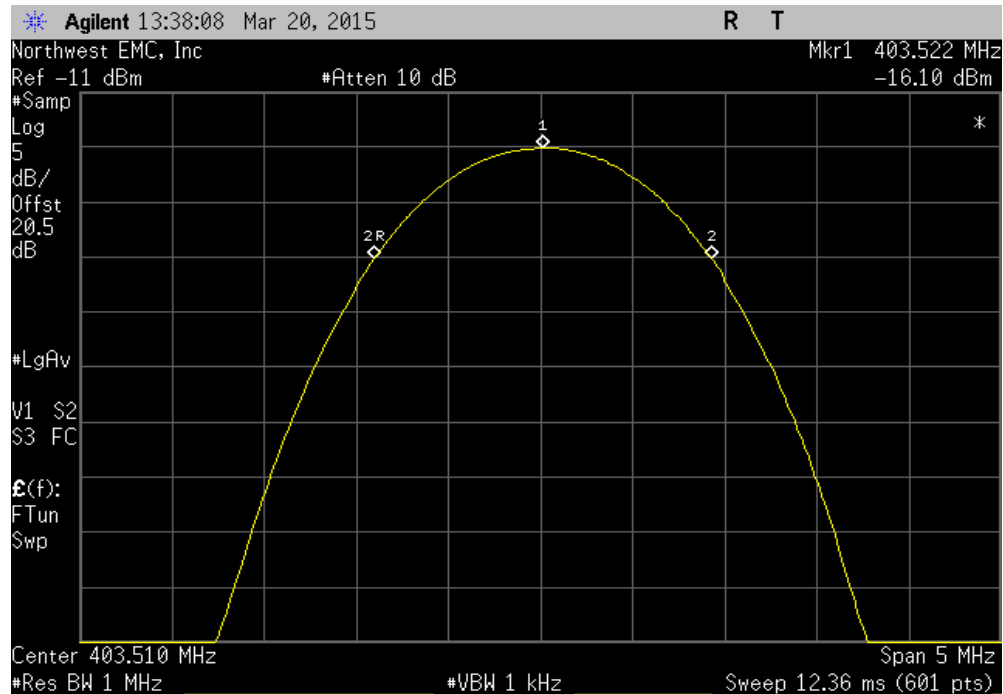
The Frequency Stability was measured using a near-field probe and a spectrum analyzer. The spectrum analyzer is configured with a precision frequency reference that exceeds the stability requirement of the transmitter. The EUT was placed inside a temperature / humidity chamber. The near-field probe was placed near the transmitter. A low-loss coaxial cable connected the near-field probe to the spectrum analyzer outside of the chamber.

FREQUENCY STABILITY

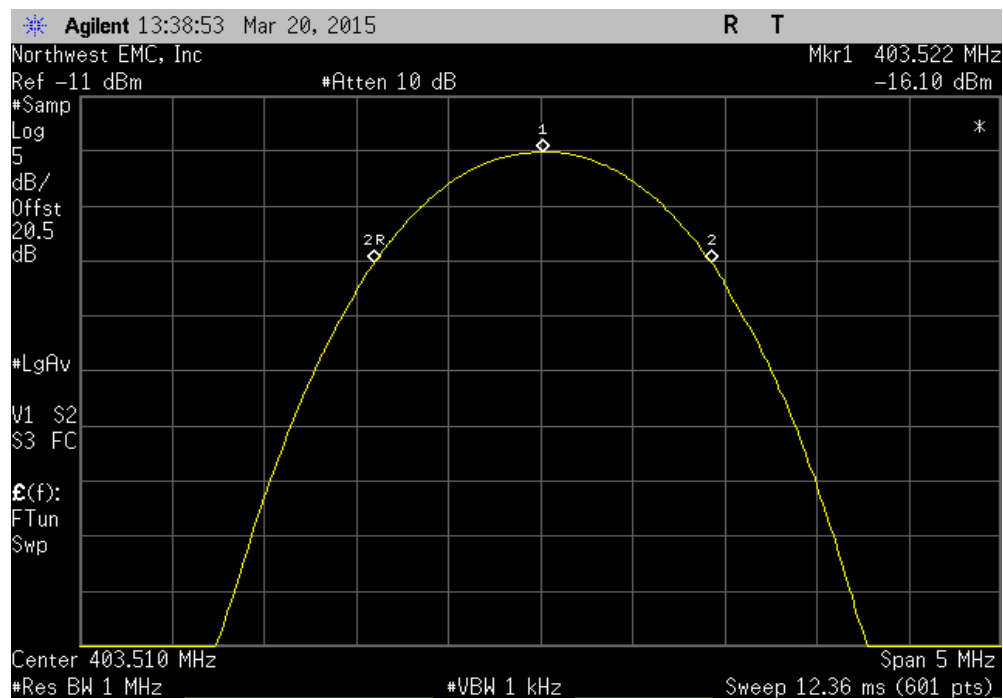
EUT: Jaguar, Model 6290		Work Order: BSTN0554				
Serial Number: 601		Date: 03/23/15				
Customer: Boston Scientific Corporation		Temperature: 22.6°C				
Attendees: None		Humidity: 19%				
Project: None		Barometric Pres.: 1025.1				
Tested by: Johnathan Lee		Power: 110VAC/60Hz				
		Job Site: MN05				
TEST SPECIFICATIONS		Test Method				
FCC 951:2015		ANSI/TIA/EIA-603-C-2004				
COMMENTS						
US Power Setting = 51. Transmitting a modulated carrier at 76.8 kbps.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	3	Signature 				
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
Normal Voltage	403.51 MHz	403.522	403.51	29.7	100	Pass
Extreme Voltage +15%	403.51 MHz	403.522	403.51	29.7	100	Pass
Extreme Voltage -15%	403.51 MHz	403.522	403.51	29.7	100	Pass
Extreme Temperature +55°C	403.51 MHz	403.522	403.51	29.7	100	Pass
Extreme Temperature +50°C	403.51 MHz	403.522	403.51	29.7	100	Pass
Extreme Temperature +40°C	403.51 MHz	403.526	403.51	39.7	100	Pass
Extreme Temperature +30°C	403.51 MHz	403.522	403.51	29.7	100	Pass
Extreme Temperature +20°C	403.51 MHz	403.526	403.51	39.7	100	Pass
Extreme Temperature +10°C	403.51 MHz	403.522	403.51	29.7	100	Pass
Extreme Temperature 0°C	403.51 MHz	403.522	403.51	29.7	100	Pass
	403.51 MHz	403.526	403.51	39.7	100	Pass

FREQUENCY STABILITY

Normal Voltage, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.522	403.51	29.7	100	Pass	

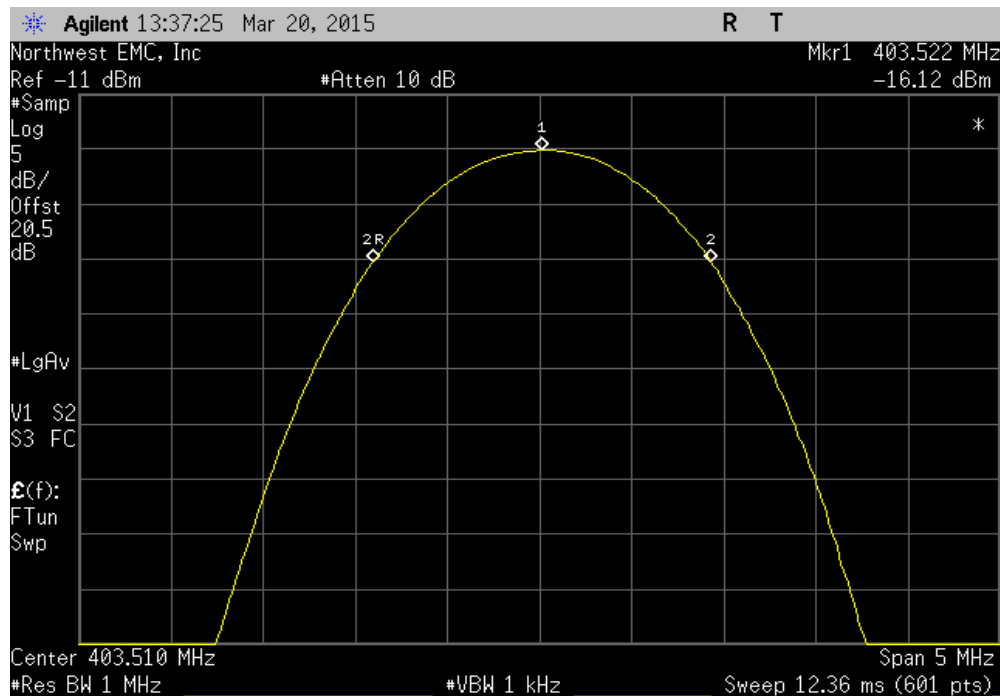


Extreme Voltage +15%, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.522	403.51	29.7	100	Pass	

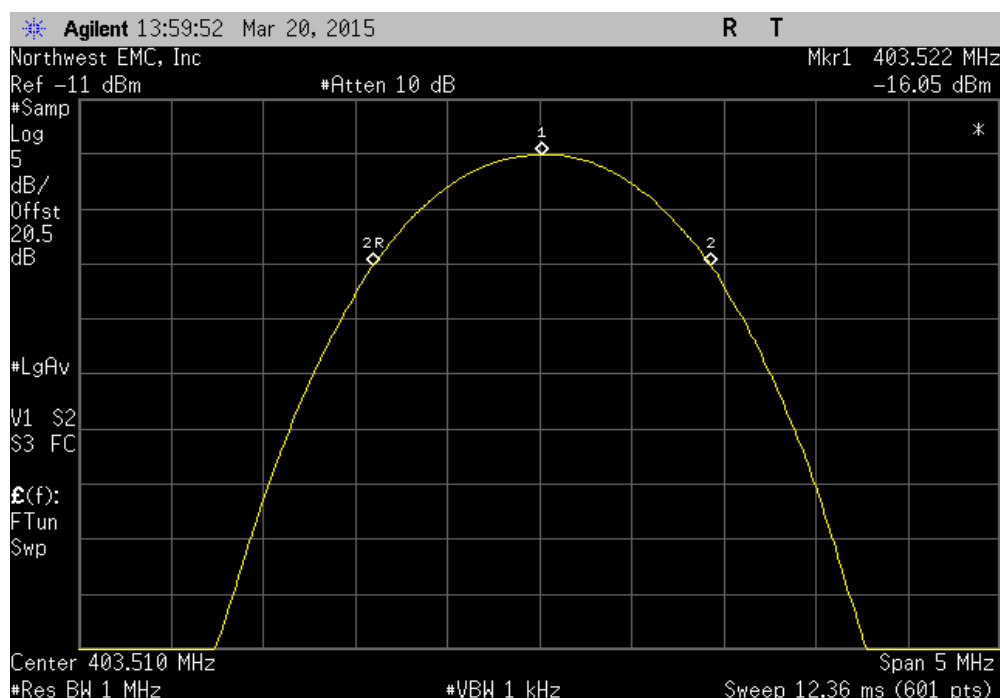


FREQUENCY STABILITY

Extreme Voltage -15%, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.522	403.51	29.7	100	Pass	

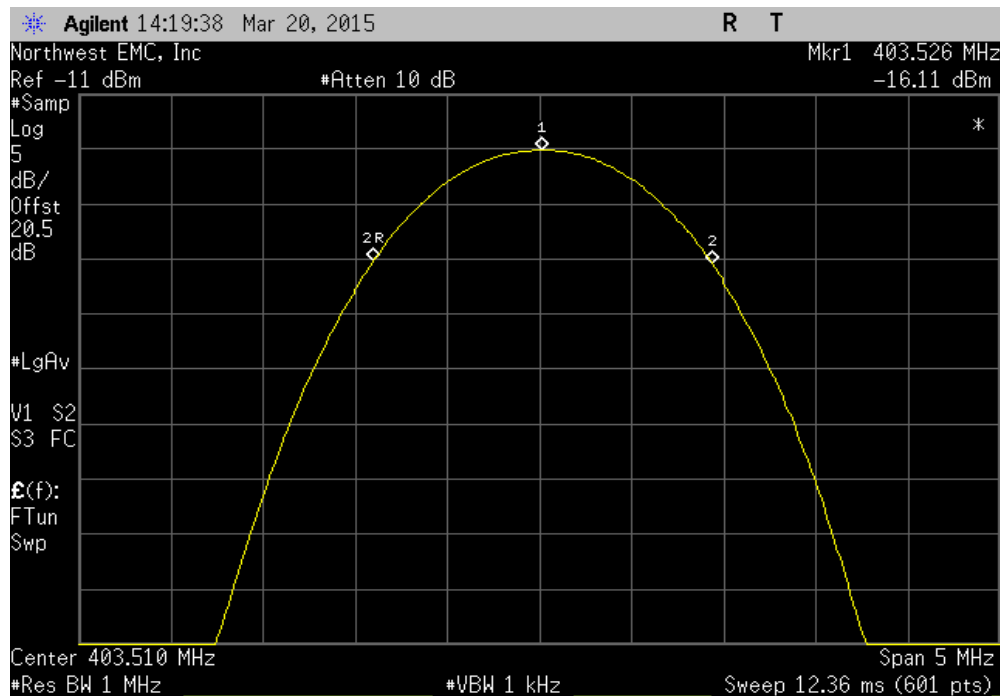


Extreme Temperature +55°C, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.522	403.51	29.7	100	Pass	

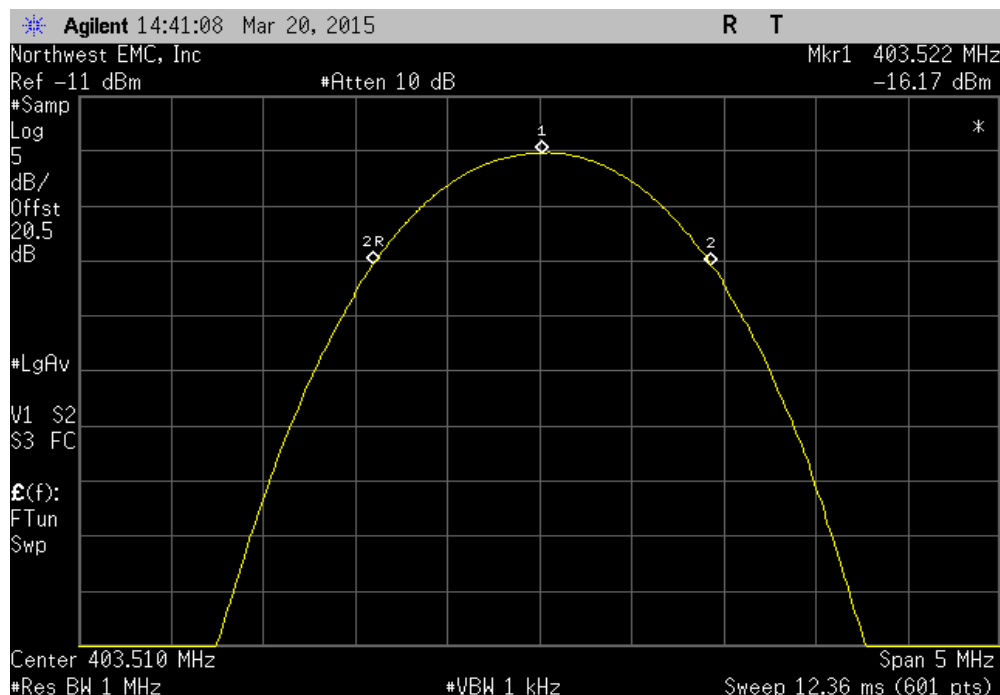


FREQUENCY STABILITY

Extreme Temperature +50°C, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.526	403.51	39.7	100	Pass	

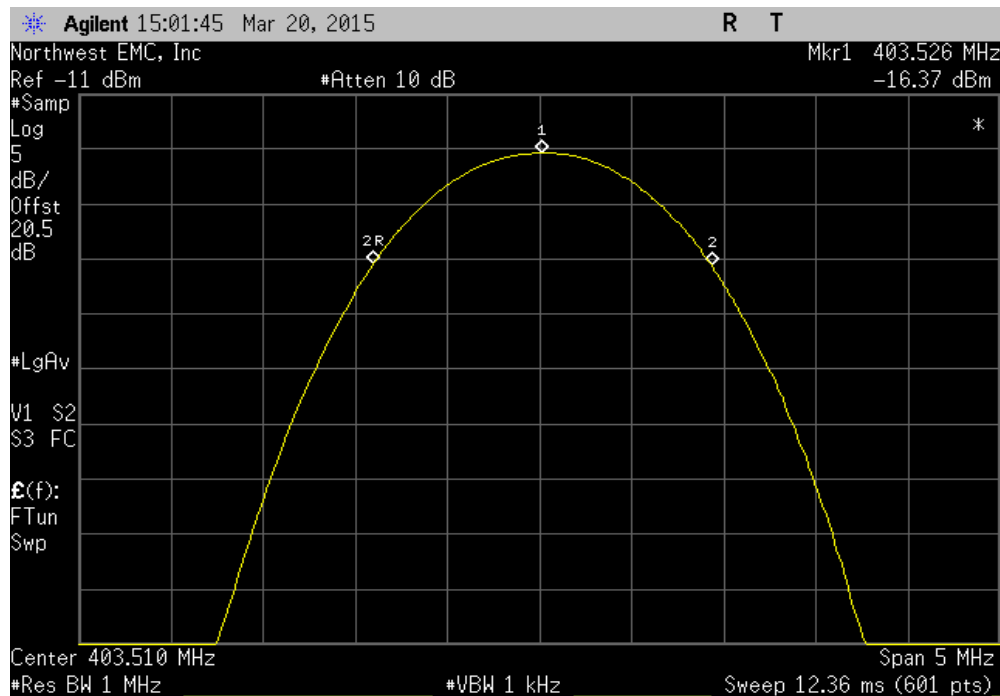


Extreme Temperature +40°C, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.522	403.51	29.7	100	Pass	

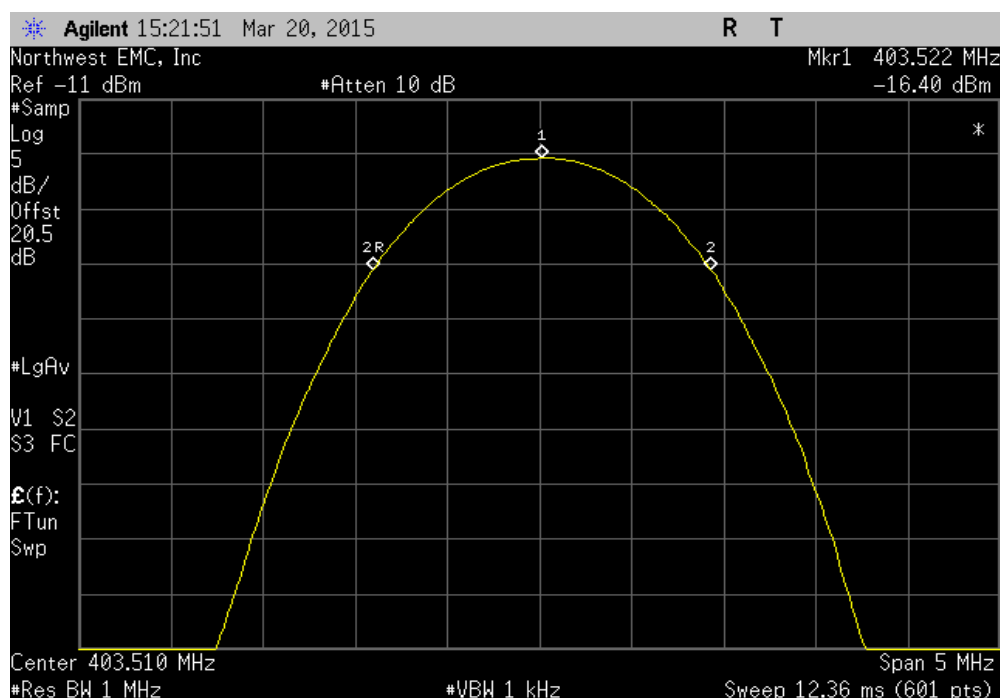


FREQUENCY STABILITY

Extreme Temperature +30°C, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.526	403.51	39.7	100	Pass	

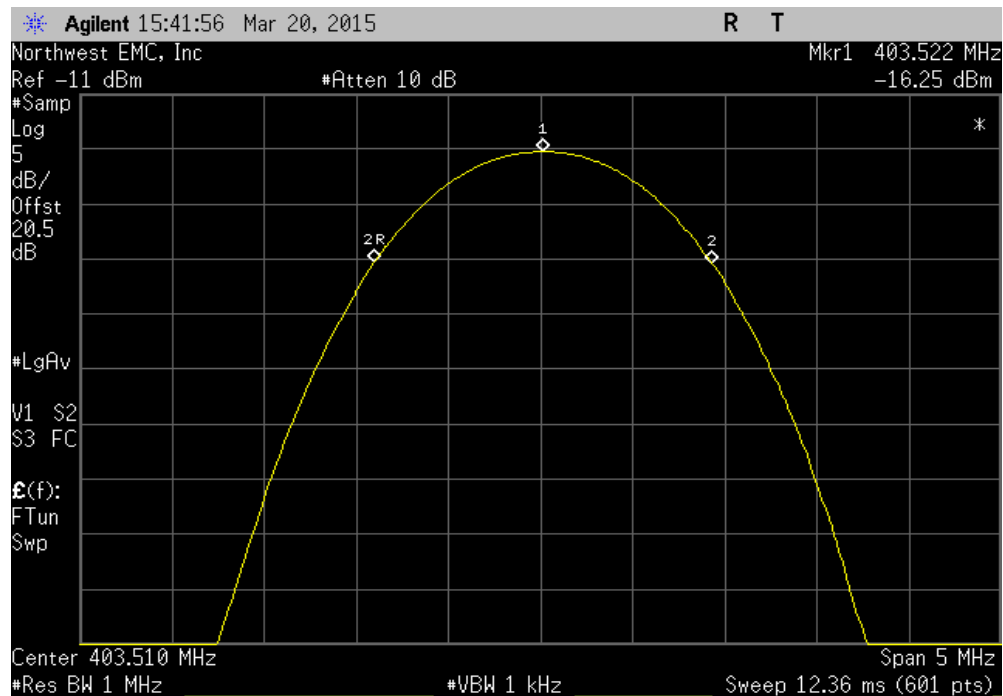


Extreme Temperature +20°C, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.522	403.51	29.7	100	Pass	

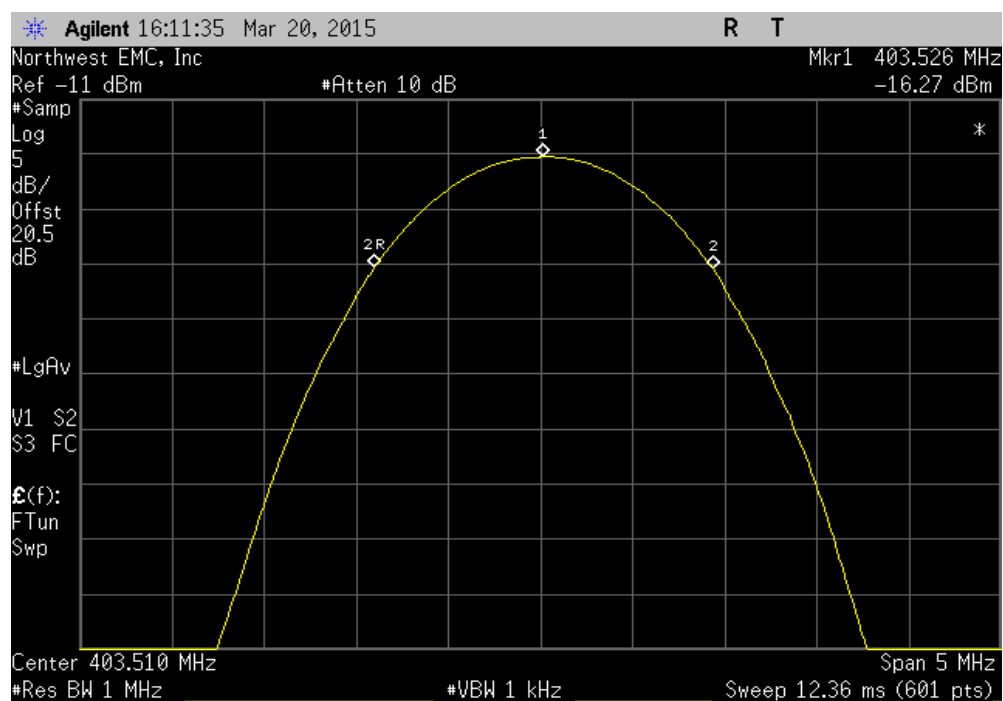


FREQUENCY STABILITY

Extreme Temperature +10°C, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.522	403.51	29.7	100	Pass	



Extreme Temperature 0°C, 403.51 MHz						
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results	
	403.526	403.51	39.7	100	Pass	



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 403.51 MHz, 76.8 kbps (high baud rate)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

BSTN0554 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 5 GHz

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
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cab	MNI	3/2/2015	12 mo
Antenna, Horn	ETS	3115	AJA	6/3/2014	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/2/2015	12 mo
Antenna, Biconilog	Teseq	CBL 6141B	AYD	12/17/2013	24 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/2/2015	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	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

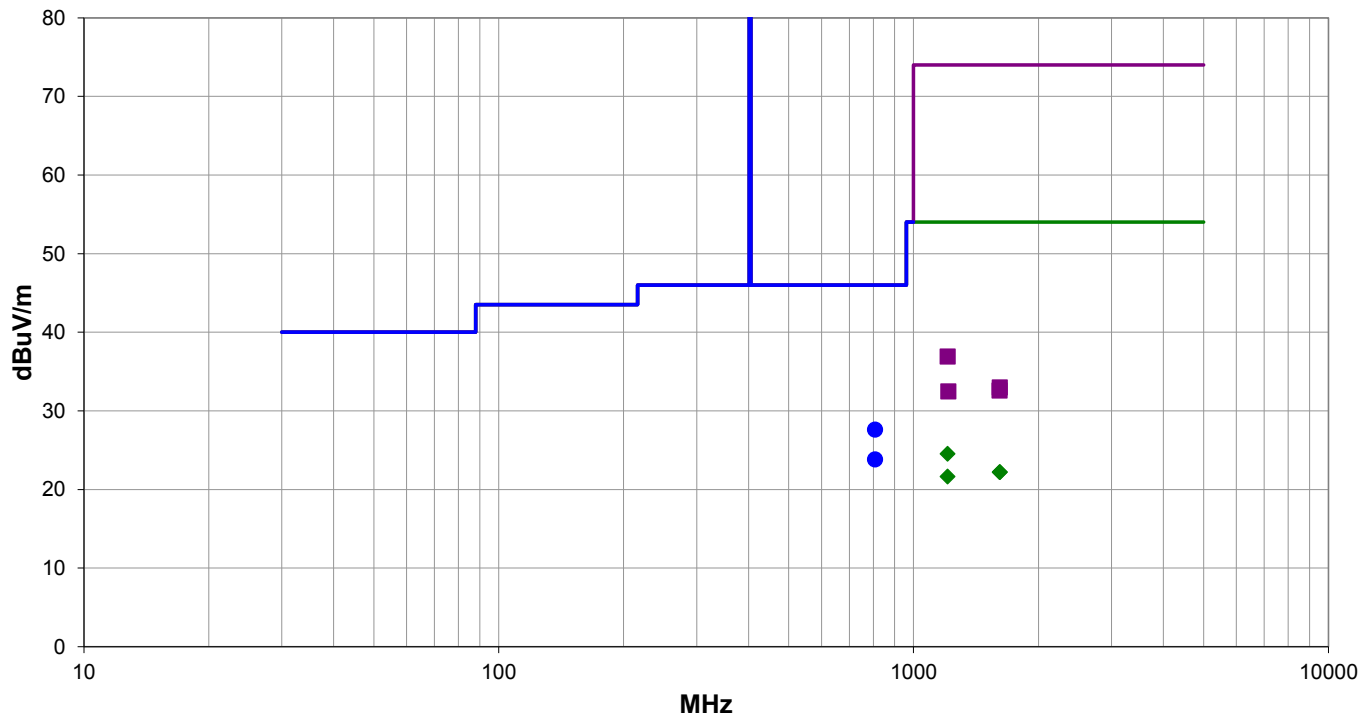
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured in the modes listed in the datasheet. For each configuration, the spectrum was scanned throughout the specified range. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp was used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS

Work Order:	BSTN0554	Date:	03/20/15	<i>Trevor Buls</i>	
Project:	None	Temperature:	22.5 °C		
Job Site:	MN05	Humidity:	21.8% RH		
Serial Number:	601	Barometric Pres.:	1017 mbar	Tested by:	Jonathan Kiefer
EUT:	Jaguar, Model 6290				
Configuration:	1				
Customer:	Boston Scientific Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 403.51 MHz, 76.8 kbps (high baud rate)				
Deviations:	None				
Comments:	US Power Setting = 51. EUT was tested in Horizontal position per the manufacturer because the device will always be operated in this position. Transmitting a modulated carrier at 76.8 kbps.				

Test Specifications	Test Method
FCC 951:2015	ANSI/TIA/EIA-603-C:2004

Run #	4	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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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)
807.113	18.9	8.7	1.0	337.0	3.0	0.0	Horz	QP	0.0	27.6	46.0	-18.4
807.128	15.1	8.7	1.0	133.0	3.0	0.0	Vert	QP	0.0	23.8	46.0	-22.2
1208.117	31.5	-7.0	1.0	196.1	3.0	0.0	Horz	AV	0.0	24.5	54.0	-29.5
1616.167	28.1	-5.9	1.0	257.0	3.0	0.0	Vert	AV	0.0	22.2	54.0	-31.8
1614.250	28.1	-5.9	3.3	231.0	3.0	0.0	Horz	AV	0.0	22.2	54.0	-31.8
1208.067	28.6	-7.0	1.0	235.0	3.0	0.0	Vert	AV	0.0	21.6	54.0	-32.4
1208.133	43.9	-7.0	1.0	196.1	3.0	0.0	Horz	PK	0.0	36.9	74.0	-37.1
1612.358	38.9	-5.9	3.3	231.0	3.0	0.0	Horz	PK	0.0	33.0	74.0	-41.0
1612.108	38.5	-5.9	1.0	257.0	3.0	0.0	Vert	PK	0.0	32.6	74.0	-41.4
1213.000	39.4	-6.9	1.0	235.0	3.0	0.0	Vert	PK	0.0	32.5	74.0	-41.5

SPURIOUS CONDUCTED EMISSIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	E4443A	AAS	3/27/2014	12
40 GHz DC Block	Fairview Microwave	SD3379	AMI	10/2/2014	12
MN08 Direct Connect Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	10/2/2014	12
Attenuator, 20db, 'SMA'	SM Electronics	SA26B-20	RFW	3/10/2015	12
Spectrum Analyzer	Agilent	E4440A	AAX	4/28/2014	12

TEST DESCRIPTION

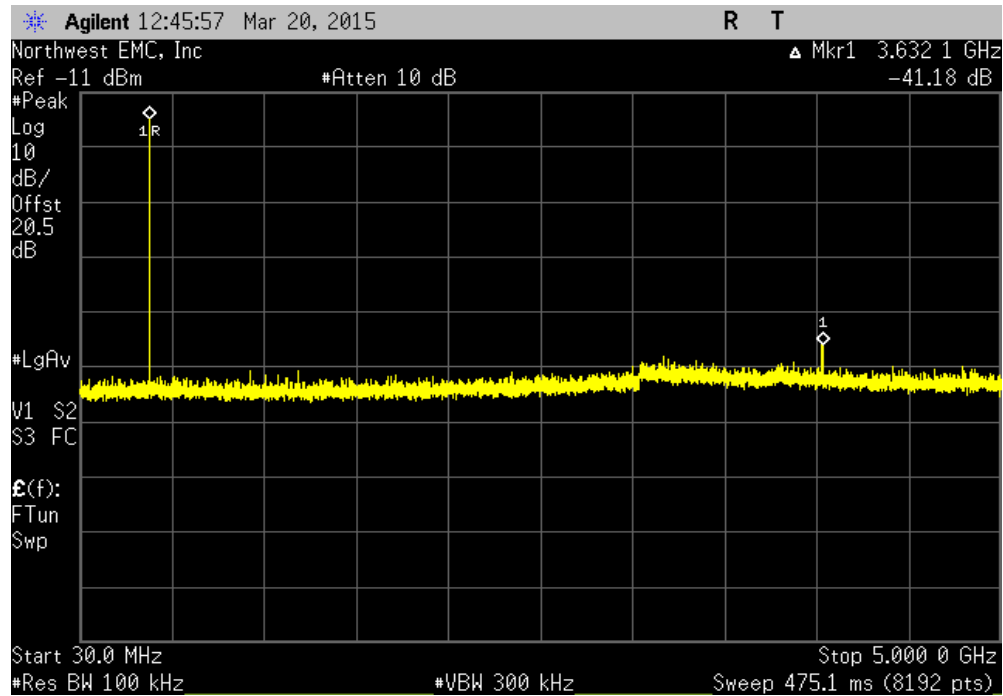
Per FCC Part 2.1052, RSS-GEN, the output power shall be measured at the RF terminal. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate. FCC Part 95 and RSS-243 have no conducted spurious limit. It is a requirement to characterize this information and that data is contained within this datasheet.

SPURIOUS CONDUCTED EMISSIONS

EUT: Jaguar, Model 6290		Work Order: BSTN0554	
Serial Number: 601		Date: 03/20/15	
Customer: Boston Scientific Corporation		Temperature: 22.8°C	
Attendees: None		Humidity: 23%	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Jonathan Kiefer	Power: 110VAC/60Hz	Job Site: MN08	
TEST SPECIFICATIONS			
FCC 951:2015		Test Method: ANSI/TIA/EIA-603-C-2004	
COMMENTS			
US Power Setting = 51. Transmitting a modulated carrier at 76.8 kbps.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature: <i>Trevor Buls</i>	
		Frequency Range	Value (dBc) Limit (dBc) Result
403.51 MHz		30 MHz - 5 GHz	-41.18 N/A N/A

SPURIOUS CONDUCTED EMISSIONS

403.51 MHz				
Frequency	Value	Limit	Result	
Range	(dBc)	(dBc)		
30 MHz - 5 GHz	-41.18	N/A	N/A	



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 Low, High channels: 402.8183, 403.5108 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

BSTN0554 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	1000 MHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator MXG	Agilent	N5183A	TIK	10/17/2014	36 mo
Power Sensor	Agilent	N8481A	SQN	8/22/2014	12 mo
Power Meter	Agilent	N1913A	SQL	8/22/2014	12 mo
Antenna, Dipole	EMCO	3121C-DB4	ADI	12/21/2012	36 mo
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	HGK	3/2/2015	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/2/2015	12 mo
Antenna, Biconilog	Teseq	CBL 6141B	AYD	12/17/2013	24 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12 mo

TEST DESCRIPTION

Per 95.627(g)(3), the maximum radiated field strength for a MICS transmitter is 25uW EIRP. The Field Strength of the Fundamental data was converted to EIRP with the formula based upon the Friis transmission equation with 6 dB removed due to reflections from the ground plane: $EIRP = ((E/2)*d)^2/30$ where E is V/m and d = distance = 3m, and $EIRP = W$.

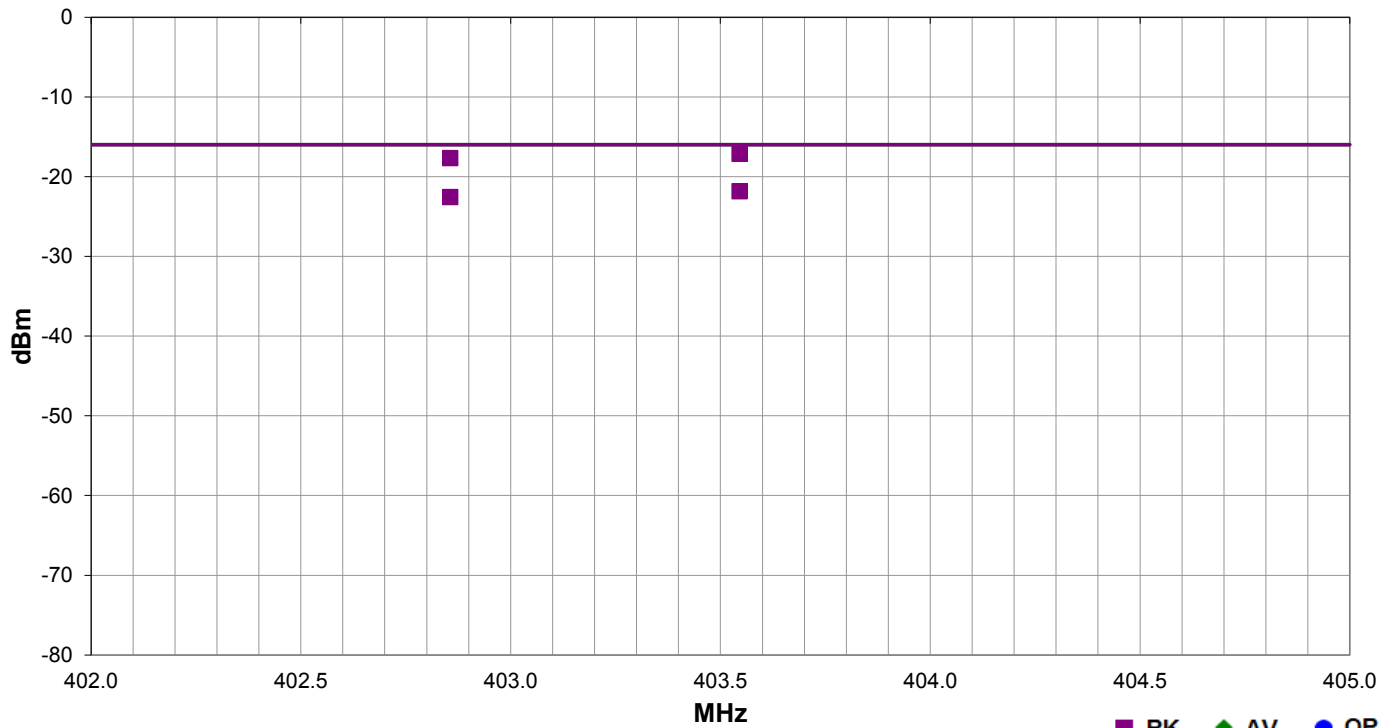
The Field Strength of the Fundamental was measured in the far-field at an FCC Listed Semi-anechoic Chamber. Spectrum analyzer and linearly polarized antennas were used to measure the radiated field strength of the fundamental.

The orientation of the EUT and measurement antenna were manipulated to maximize the level of emissions. The turntable azimuth was varied to maximize the level of radiated emissions. The height of the measurement antenna was also varied from 1 to 4 meters. The amplitude and frequency of the emissions were noted.

Work Order:	BSTN0554	Date:	03/17/15		
Project:	None	Temperature:	22.2 °C		
Job Site:	MN05	Humidity:	24.2% RH		
Serial Number:	000601	Barometric Pres.:	1032 mbar	Tested by:	Johnathan Lee
EUT:	Model 6290 Jaguar Communicator				
Configuration:	1				
Customer:	Boston Scientific Corporation				
Attendees:	Pete Musto				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting Channel 10 = 403.5108 MHz and Channel 11 = 402.8183 MHz.				
Deviations:	None				
Comments:	US Power Setting = 51. EUT was tested in Horizontal position per the manufacturer because the device will always be operated in this position. Transmitting an unmodulated carrier.				

Test Specifications	Test Method
FCC 95I:2015	ANSI/TIA/EIA-603-C:2004

Run #	8	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Evaluation
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Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
403.546	1.0	354.0	Horz	PK	1.93E-05	-17.1	-16.0	-1.1	EUT Horizontal, Ch 10, Pwr 51
402.856	1.0	353.0	Horz	PK	1.72E-05	-17.7	-16.0	-1.7	EUT Horizontal, Ch 11, Pwr 51
403.546	1.0	184.1	Vert	PK	6.55E-06	-21.8	-16.0	-5.8	EUT Horizontal, Ch 10, Pwr 51
402.856	1.0	184.1	Vert	PK	5.55E-06	-22.6	-16.0	-6.6	EUT Horizontal, Ch 11, Pwr 51

AC POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESR7	ARI	05/06/2014	12 mo
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	05/15/2014	12 mo
MN03 Cables	ESM Cable Corp.	Conducted Cables	MNC	11/20/2014	12 mo
Attenuator 20dB, BNC	Fairview Microwave	SA01B-20	AQP	07/22/2014	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HGN	05/23/2014	12 mo

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

BSTN0554-2

MODES INVESTIGATED

Transmitting at 403.51 MHz, 76.8 kbps (high baud rate)

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Jaguar, Model 6290	Work Order:	BSTN0554
Serial Number:	601	Date:	03/20/2015
Customer:	Boston Scientific Corporation	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	22.6%
Customer Project:	None	Bar. Pressure:	1017 mb
Tested By:	Jonathan Kiefer	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	BSTN0554-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	3	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

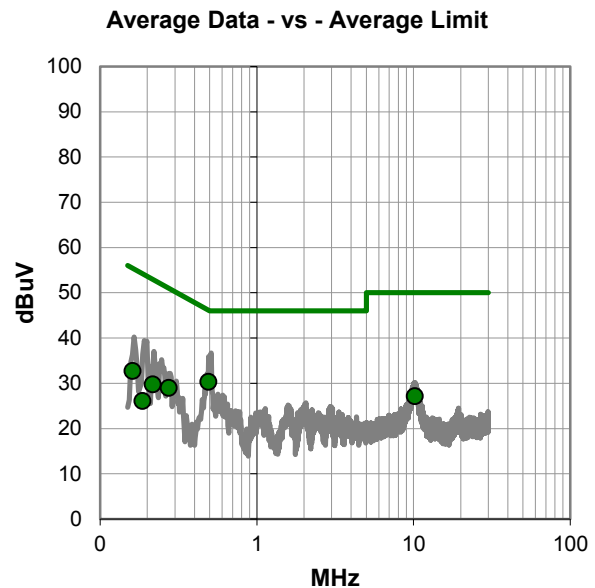
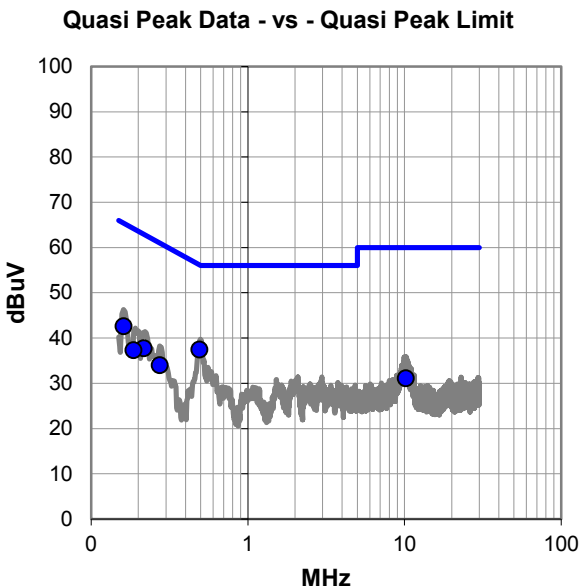
US Power Setting = 51. Transmitting a modulated carrier at 76.8 kbps.

EUT OPERATING MODES

Transmitting at 403.51 MHz, 76.8 kbps (high baud rate).

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.491	17.2	20.2	37.4	56.1	-18.7
0.161	22.4	20.2	42.6	65.4	-22.8
0.217	17.6	20.1	37.7	62.9	-25.2
0.186	17.1	20.2	37.3	64.2	-26.9
0.275	13.8	20.1	33.9	61.0	-27.0
10.219	10.3	20.8	31.1	60.0	-28.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.491	10.1	20.2	30.3	46.1	-15.8
0.275	8.8	20.1	28.9	51.0	-22.0
0.161	12.5	20.2	32.7	55.4	-22.7
10.219	6.4	20.8	27.2	50.0	-22.8
0.217	9.6	20.1	29.7	52.9	-23.2
0.186	5.9	20.2	26.1	54.2	-28.1

CONCLUSION

Pass

Trevor Buls

Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Jaguar, Model 6290	Work Order:	BSTN0554
Serial Number:	601	Date:	03/20/2015
Customer:	Boston Scientific Corporation	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	22.6%
Customer Project:	None	Bar. Pressure:	1017 mb
Tested By:	Jonathan Kiefer	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	BSTN0554-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

TEST PARAMETERS

Run #:	4	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

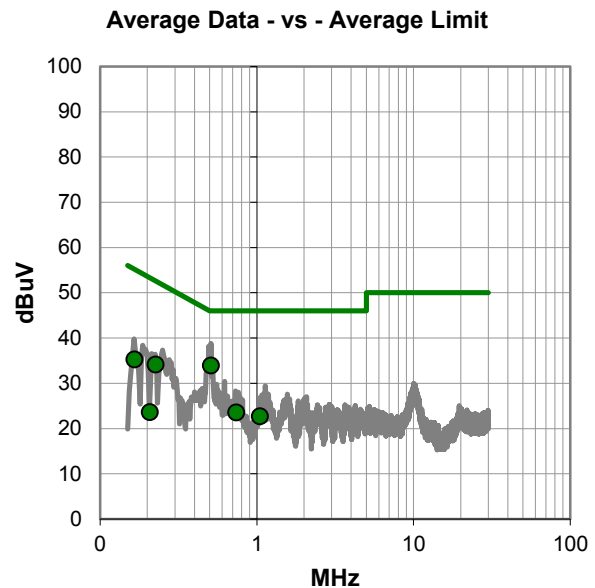
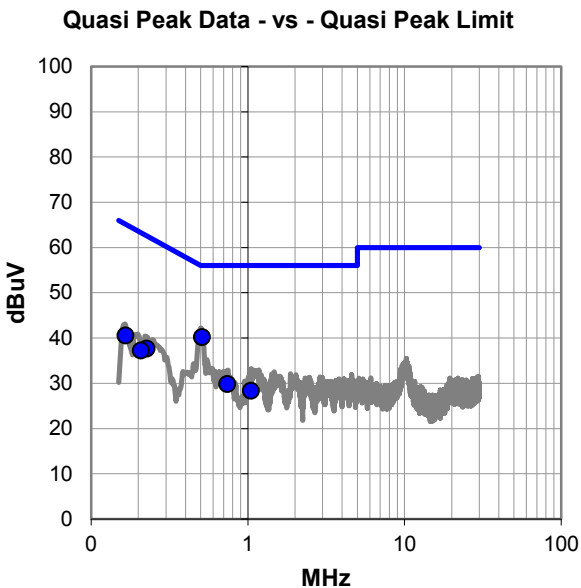
US Power Setting = 51. Transmitting a modulated carrier at 76.8 kbps.

EUT OPERATING MODES

Transmitting at 403.51 MHz, 76.8 kbps (high baud rate)

DEVIATIONS FROM TEST STANDARD

None



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.510	20.0	20.2	40.2	56.0	-15.8
0.166	20.3	20.2	40.5	65.2	-24.7
0.226	17.5	20.1	37.6	62.6	-25.0
0.208	17.1	20.1	37.2	63.3	-26.1
0.738	9.6	20.2	29.8	56.0	-26.2
1.049	8.1	20.2	28.3	56.0	-27.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.510	13.7	20.2	33.9	46.0	-12.1
0.226	14.0	20.1	34.1	52.6	-18.5
0.166	15.0	20.2	35.2	55.2	-20.0
0.738	3.3	20.2	23.5	46.0	-22.5
1.049	2.5	20.2	22.7	46.0	-23.3
0.208	3.5	20.1	23.6	53.3	-29.7

CONCLUSION

Pass

Trevor Buls

Tested By