



Boston Scientific Corporation

Emblem S-ICD Programmer

FCC 95I:2014

FCC 15.207:2014

Report #: BSTN0474



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

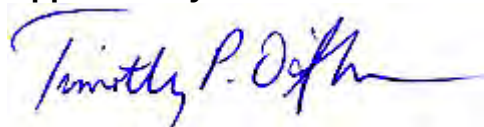
Last Date of Test: May 12, 2014
Boston Scientific Corporation
Model: Emblem S-ICD Programmer

Test Description	Specification	Test Method	Pass/Fail
Emission Bandwidth	FCC 951:2014, FCC 2.1049:2014	ANSI/TIA/EIA-603-C-2004	Pass
Output Power	FCC 951:2014, FCC 2.1046:2014	ANSI/TIA/EIA-603-C-2004	Pass
Emission Mask	FCC 951:2014, FCC 2.1049:2014	ANSI/TIA/EIA-603-C-2004	Pass
Spurious Conducted Emissions	FCC 951:2014, FCC 2.1052:2014	ANSI/TIA/EIA-603-C-2004	Pass
Frequency Stability	FCC 951:2014, FCC 2.1055:2014	ANSI/TIA/EIA-603-C-2004	Pass
Radiated Power (EIRP)	FCC 951:2014, FCC 2.1053:2014	ANSI/TIA/EIA-603-C-2004	Pass
Spurious Radiated Emissions	FCC 951:2014, FCC 2.1053:2014	ANSI/TIA/EIA-603-C-2004	Pass
Powerline Conducted Emissions	FCC 15.207:2014	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager



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.

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 HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

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 Guide 65 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

KCC / 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.

Hong Kong

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

Vietnam

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

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

SCOPE

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

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

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.

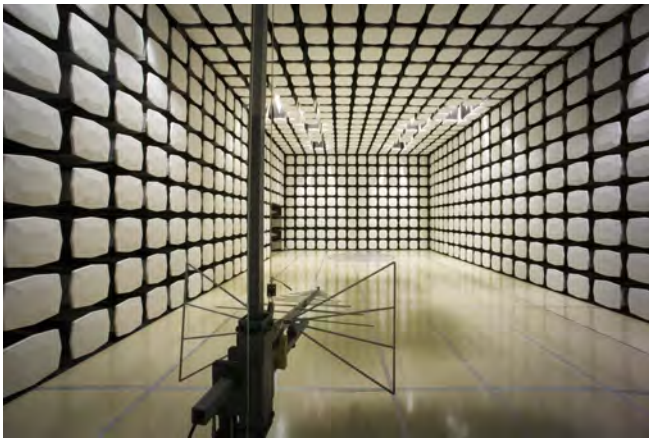
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. Our measurement 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 16-4-1 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)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94



Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs NC01-05, SU02, SU07 19201 120 th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834F-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0



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:	Emblem S-ICD Programmer
First Date of Test:	May 07, 2014
Last Date of Test:	May 12, 2014
Receipt Date of Samples:	May 07, 2014
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
A computing and radio platform which provides qualified field personnel, designated distributors, clinicians, and physicians with the capability to communicate with and program an S-ICD active medical implant. The radio platform provides bidirectional, very low power communications in the 402-405 MHz band as specified by the Medical Implant Communication Service (MICS) specifications. Testing was performed on mid channel only per the FCC KDB inquiry number 251116.
Testing Objective:
Seeking FCC authorization for the MICS transmitter, FCC Part 95.

Configuration BSTN0474- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Programmer	Boston Scientific Corporation	3200	3200-A103233
Antenna	Boston Scientific Corporation	3203	None

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
DC Adapter	Boston Scientific Corporation	MWA020005A	000027

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Coax	Yes	3.0m	No	Programmer	Antenna
DC Power	No	1.8m	No	Programmer	DC Adapter
AC Power	No	2.4m	No	DC Adapter	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration BSTN0474- 3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Programmer	Boston Scientific Corporation	3200	3200-A103233

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
DC Adapter	Boston Scientific Corporation	MWA020005A	000027

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	1.8m	No	Programmer	DC Adapter
AC Power	No	2.4m	No	DC Adapter	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	5/07/2014	Radiated Power (EIRP)	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	5/08/2014	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.
3	5/08/2014	Frequency Stability	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	5/08/2014	Emission 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.
5	5/08/2014	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	5/08/2014	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.
7	5/08/2014	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.
8	5/12/2014	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.

EMISSION 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 (mo.)
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/3/2014	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	9/26/2013	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24

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.

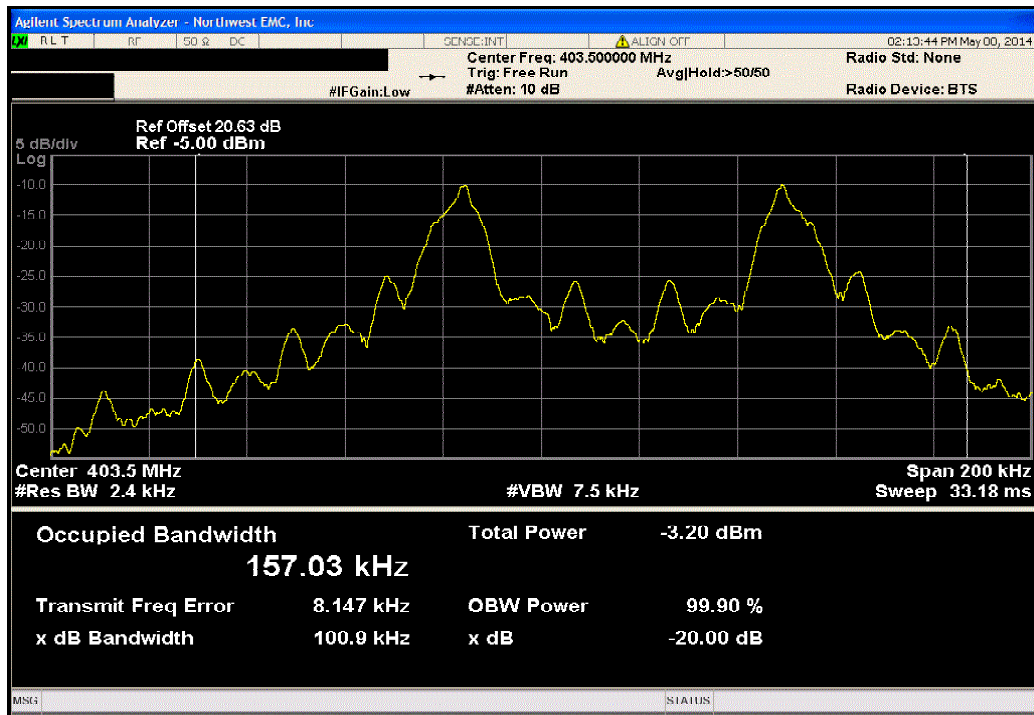


EMISSION BANDWIDTH

XMit 2014.02.07
PsaTx 2014.04.01

EUT: Emblem S-ICD Programmer		Work Order: BSTN0474	
Serial Number: 3200-A103233		Date: 05/08/14	
Customer: Boston Scientific Corporation		Temperature: 23.4°C	
Attendees: None		Humidity: 43%	
Project: None		Barometric Pres.: 1005.3	
Tested by: Trevor Buls		Power: 110VAC/60Hz	
		Job Site: MN05	
TEST SPECIFICATIONS			
FCC 95:2014		Test Method	
		ANSI/TIA/EIA-603-C-2004	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Trevor Buls</i>	
		Value	Limit
403.5 MHz		100.898 kHz	≤ 300 kHz
			Result
			Pass

403.5 MHz				Value	Limit	Result
				100.898 kHz	≤ 300 kHz	Pass



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 (mo.)
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/3/2014	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	9/26/2013	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24

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 set to its medium transmit frequency. 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.

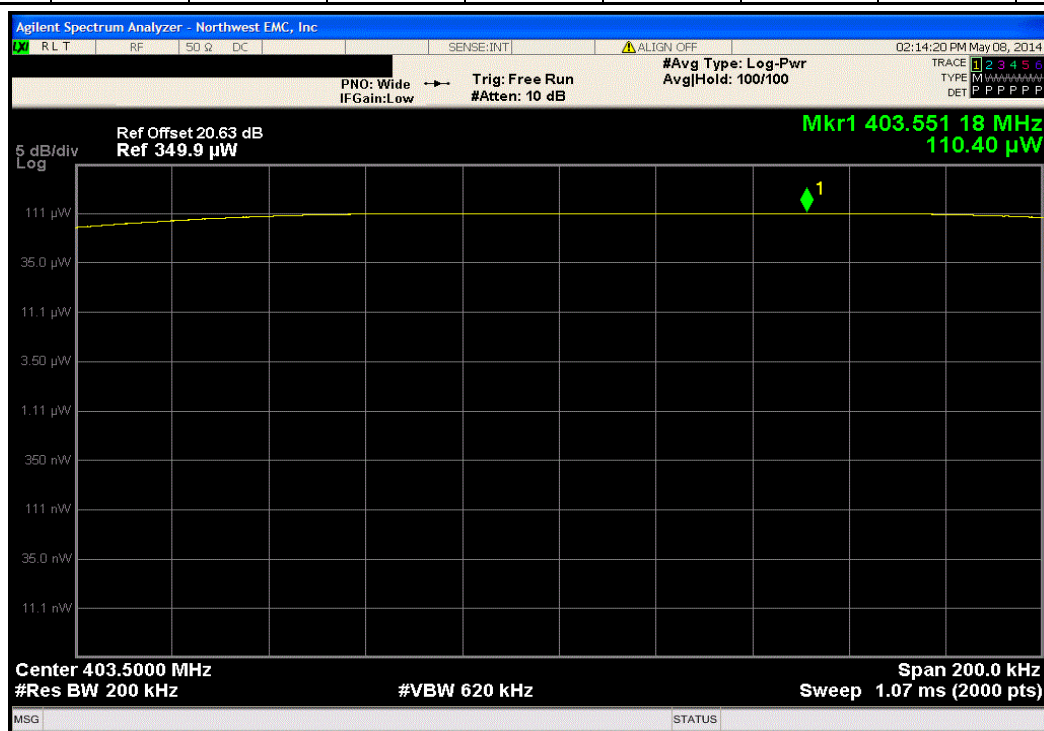


OUTPUT POWER

XMit 2014.02.07
PsaTx 2014.04.01

EUT: Emblem S-ICD Programmer		Work Order: BSTN0474	
Serial Number: 3200-A103233		Date: 05/08/14	
Customer: Boston Scientific Corporation		Temperature: 23.4°C	
Attendees: None		Humidity: 43%	
Project: None		Barometric Pres.: 1005.3	
Tested by: Trevor Buls		Power: 110VAC/60Hz	
		Job Site: MN05	
TEST SPECIFICATIONS			
FCC 95:2014		Test Method	
		ANSI/TIA/EIA-603-C-2004	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Trevor Buls</i>	
		Value	Limit
403.5 MHz		110.4 uW	N/A
			Result
			N/A

403.5 MHz						
				Value	Limit	Result
				110.4 uW	N/A	N/A



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 (mo.)
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/3/2014	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	9/26/2013	12
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24

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 MICS 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.

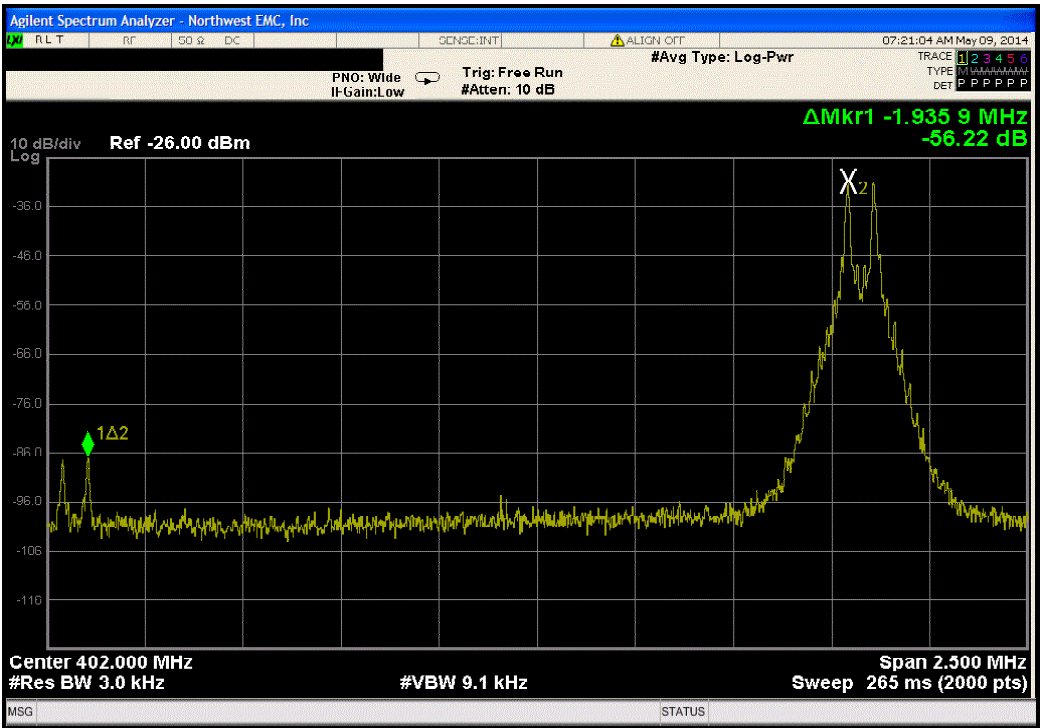


EMISSIONS MASK

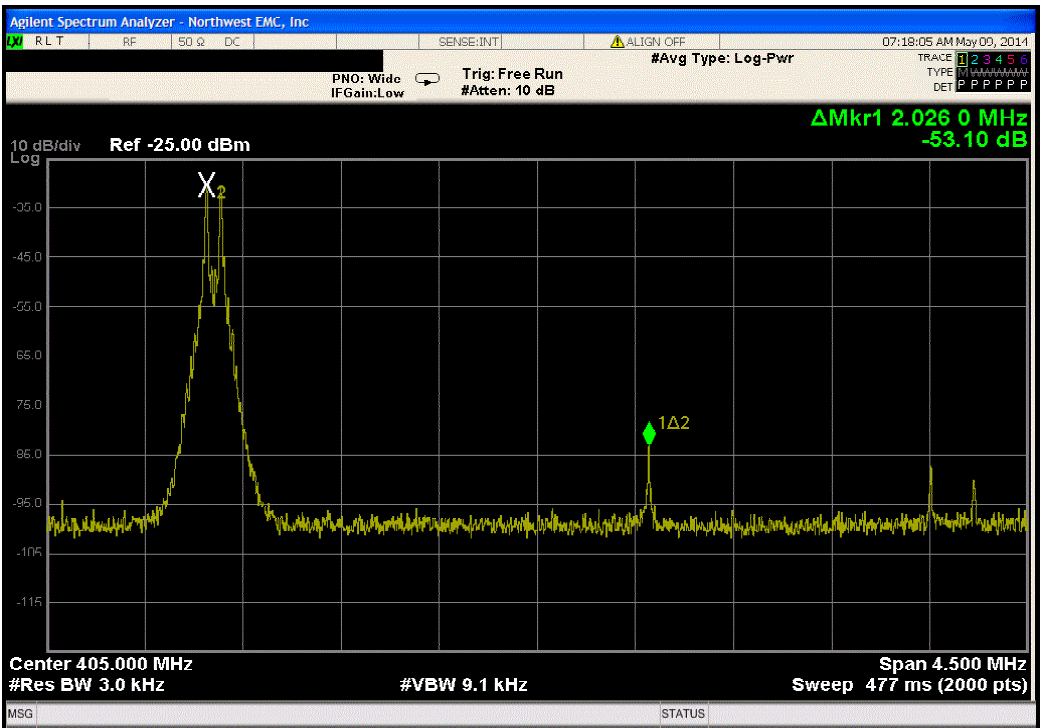
XMit 2014.02.07
PsaTx 2014.04.01

EUT: Emblem S-ICD Programmer		Work Order: BSTN0474	
Serial Number: 3200-A103233		Date: 05/08/14	
Customer: Boston Scientific Corporation		Temperature: 22.8°C	
Attendees: None		Humidity: 46%	
Project: None		Barometric Pres.: 1003	
Tested by: Trevor Buls		Power: 110VAC/60Hz	
		Job Site: MN05	
TEST SPECIFICATIONS			
FCC 95i:2014		Test Method	
		ANSI/TIA/EIA-603-C-2004	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Trevor Buls</i>	
		Value	Limit
402.8 MHz		-56.22 dBc	≤ -20 dBc
403.5 MHz		-53.1 dBc	≤ -20 dBc
			Result
			Pass
			Pass

402.8 MHz						
				Value	Limit	Result
				-56.22 dBc	≤ -20 dBc	Pass



403.5 MHz						
				Value	Limit	Result
				-53.1 dBc	≤ -20 dBc	Pass



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 (mo.)
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/3/2014	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	9/26/2013	12
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24

TEST DESCRIPTION

Per FCC Part 2.1052, RSS-GEN, the spurious emissions shall be measured at the RF terminal. The peak spurious emissions were measured with the EUT set to mid transmit frequency. 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 emissions limit. It is a requirement to characterize this information and that data is contained within this datasheet.

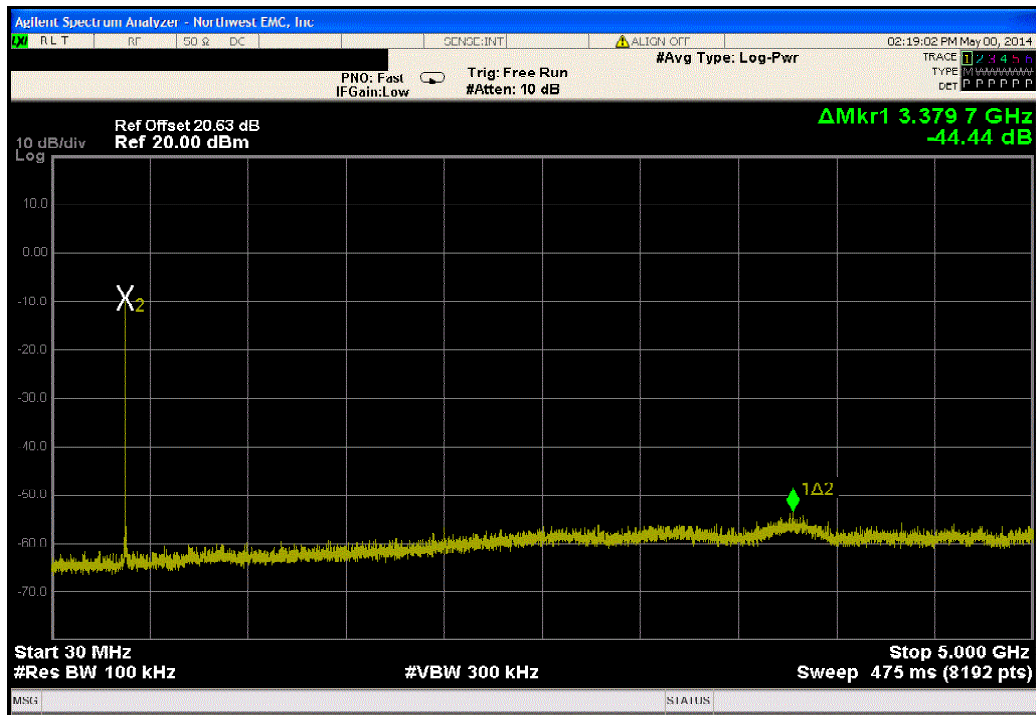


SPURIOUS CONDUCTED EMISSIONS

XMit 2014.02.07
PsaTx 2014.04.01

EUT: Emblem S-ICD Programmer		Work Order: BSTN0474			
Serial Number: 3200-A103233		Date: 05/08/14			
Customer: Boston Scientific Corporation		Temperature: 23.4°C			
Attendees: None		Humidity: 43%			
Project: None		Barometric Pres.: 1005.3			
Tested by: Trevor Buls		Power: 110VAC/60Hz			
		Job Site: MN05			
TEST SPECIFICATIONS					
FCC 95:2014		Test Method			
		ANSI/TIA/EIA-603-C-2004			
COMMENTS					
None					
DEVIATIONS FROM TEST STANDARD					
None					
Configuration #	3	Signature <i>Trevor Buls</i>			
		Frequency Range	Value	Limit	Result
403.5 MHz		30 MHz - 5 GHz	-44.44 dBc	N/A	N/A

403.5 MHz				
Frequency Range		Value	Limit	Result
30 MHz - 5 GHz		-44.44 dBc	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 (mo.)
Variable Transformer	Powerstat	246	XFR	NCR	0
Multimeter	Fluke	117	MNN	1/20/2014	36
Humidity Temperature Meter	Omega Engineering, Inc.	HH31	DUB	10/25/2011	36
Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZPH-32-3.5-SCT/AC	TBF	NCR	0
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/3/2014	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	9/26/2013	12
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24

TEST DESCRIPTION

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of the nominal voltage. A AC variable transformer 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 +55°C to +0°C in 10°C increments.

The Frequency Stability was measured using a direct connection to 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.

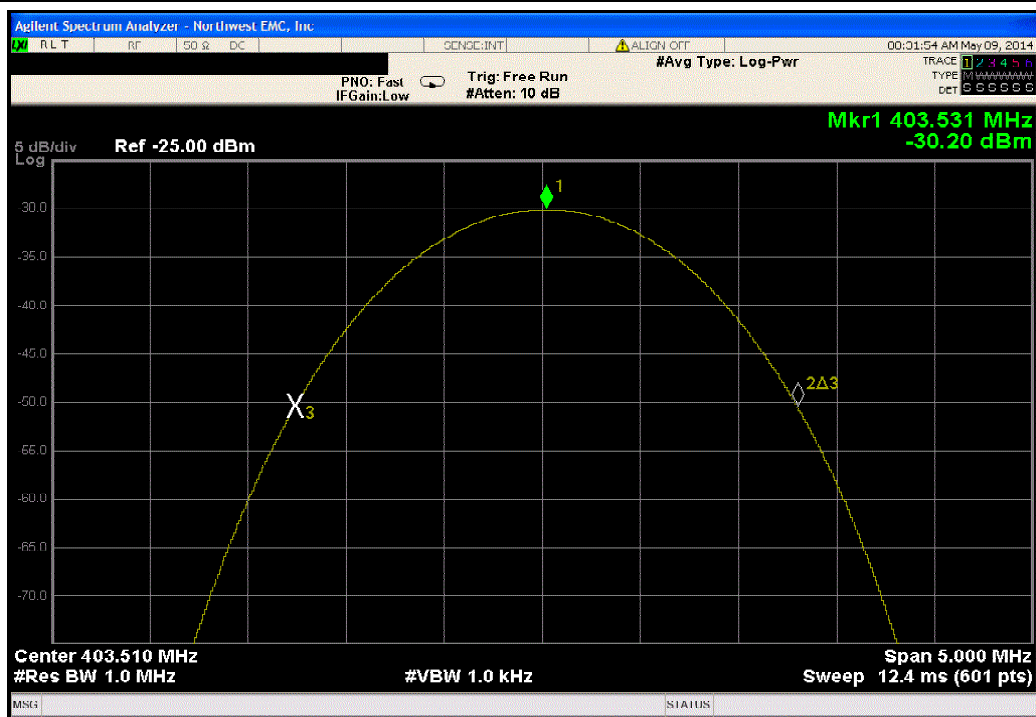


FREQUENCY STABILITY

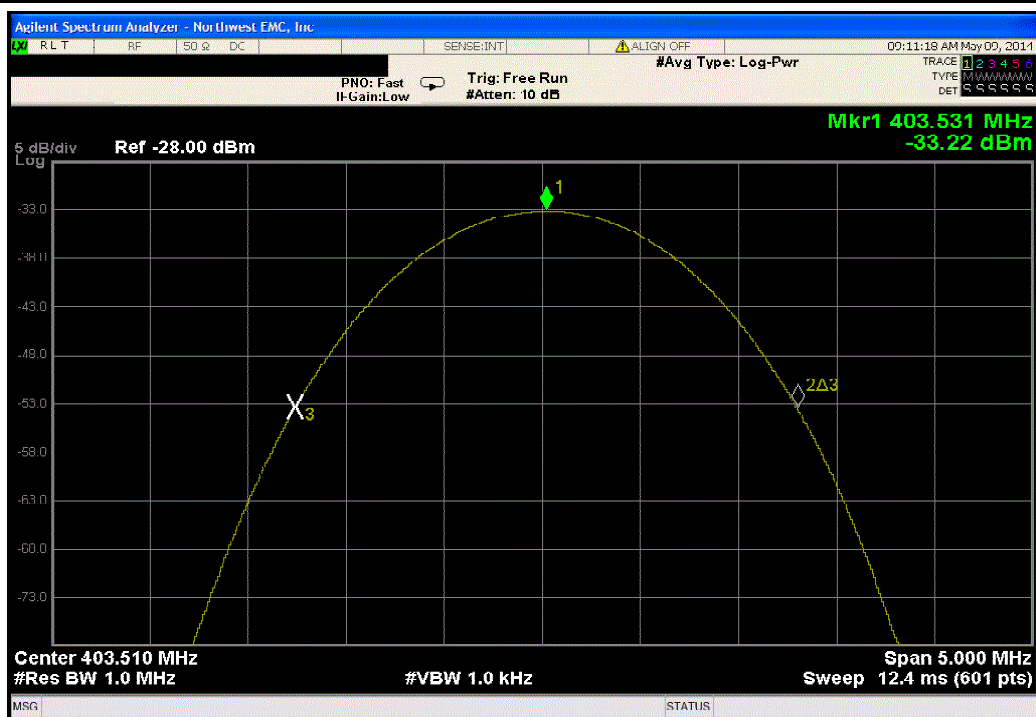
XMit 2014.02.07
PsaTx 2014.05.09

EUT: Emblem S-ICD Programmer		Work Order: BSTN0474				
Serial Number: 3200-A103233		Date: 05/08/14				
Customer: Boston Scientific Corporation		Temperature: 22.8°C				
Attendees: None		Humidity: 46%				
Project: None		Barometric Pres.: 1003				
Tested by: Trevor Buls		Power: 110VAC/60Hz				
		Job Site: MN05				
TEST SPECIFICATIONS						
FCC 95i:2014		Test Method				
		ANSI/TIA/EIA-603-C-2004				
COMMENTS						
None						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	3	Signature <i>Trevor Buls</i>				
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
Normal Voltage						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Voltage +15%						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Voltage -15%						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Temperature +55°C						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Temperature +50°C						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Temperature +40°C						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Temperature +30°C						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Temperature +20°C						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Temperature +10°C						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass
Extreme Temperature 0°C						
	403.5 MHz	403.5308333	403.51	51.6	100	Pass

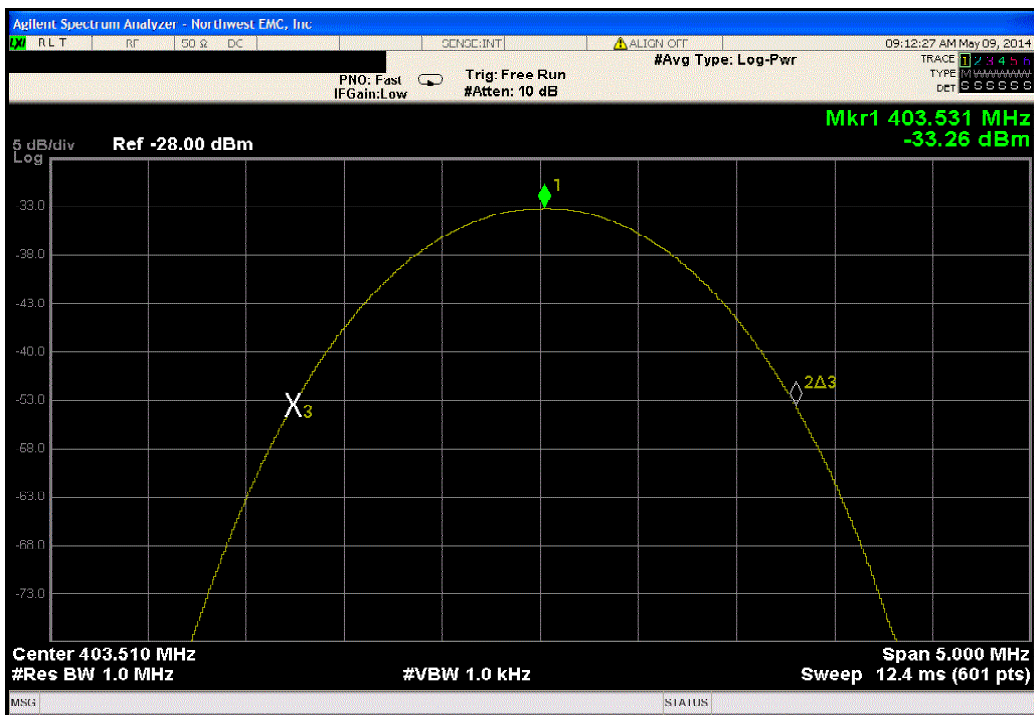
Normal Voltage, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



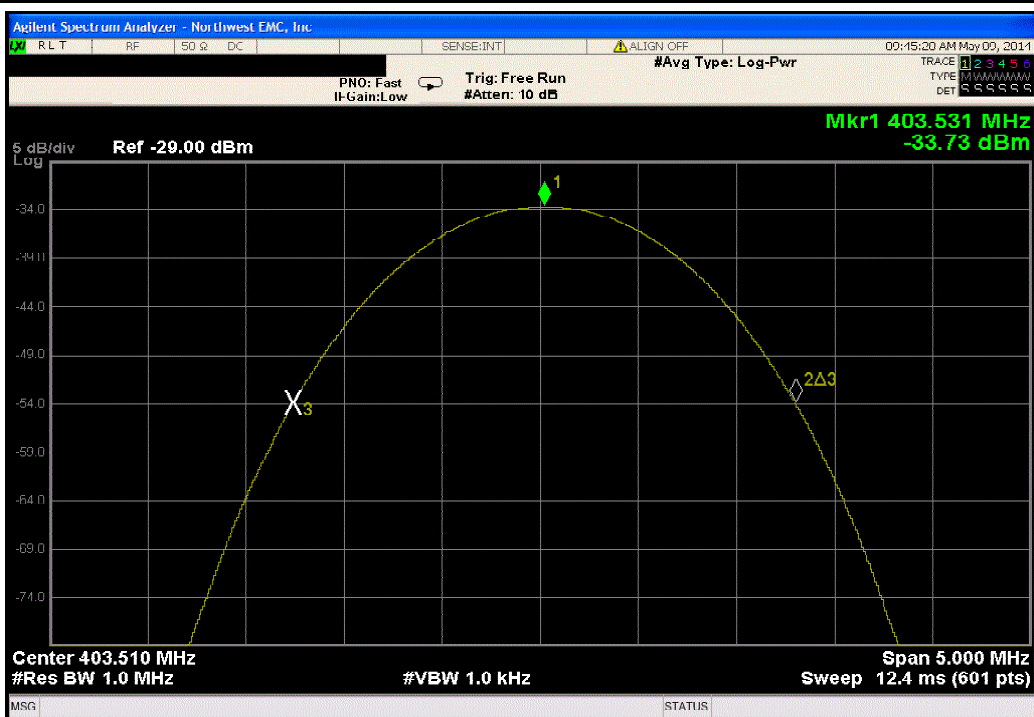
Extreme Voltage +15%, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



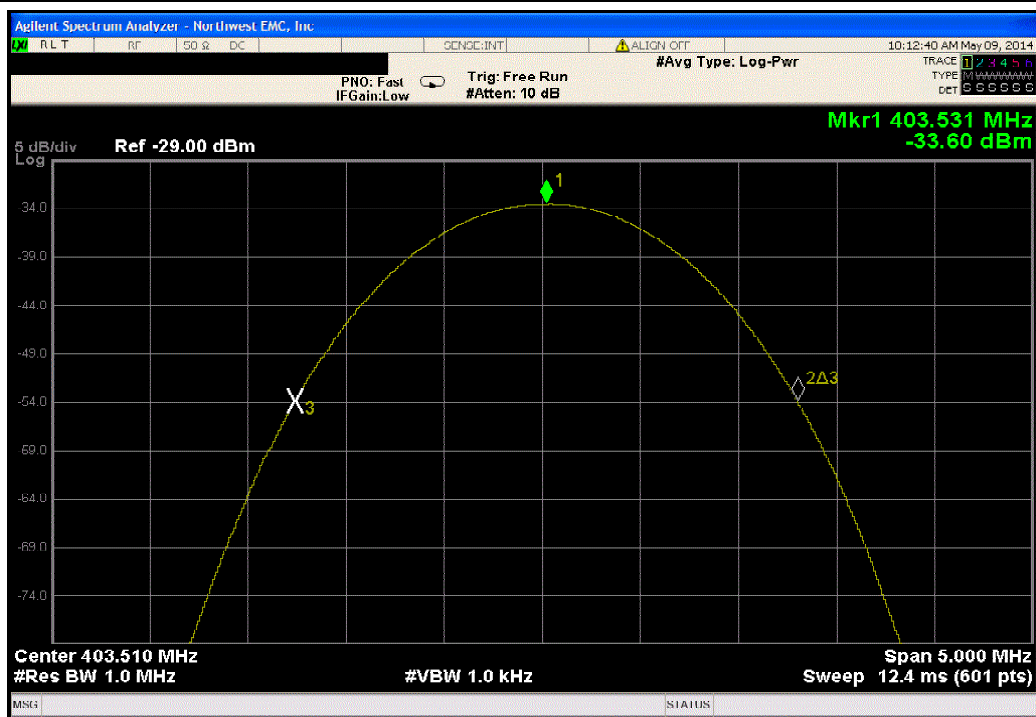
Extreme Voltage -15%, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



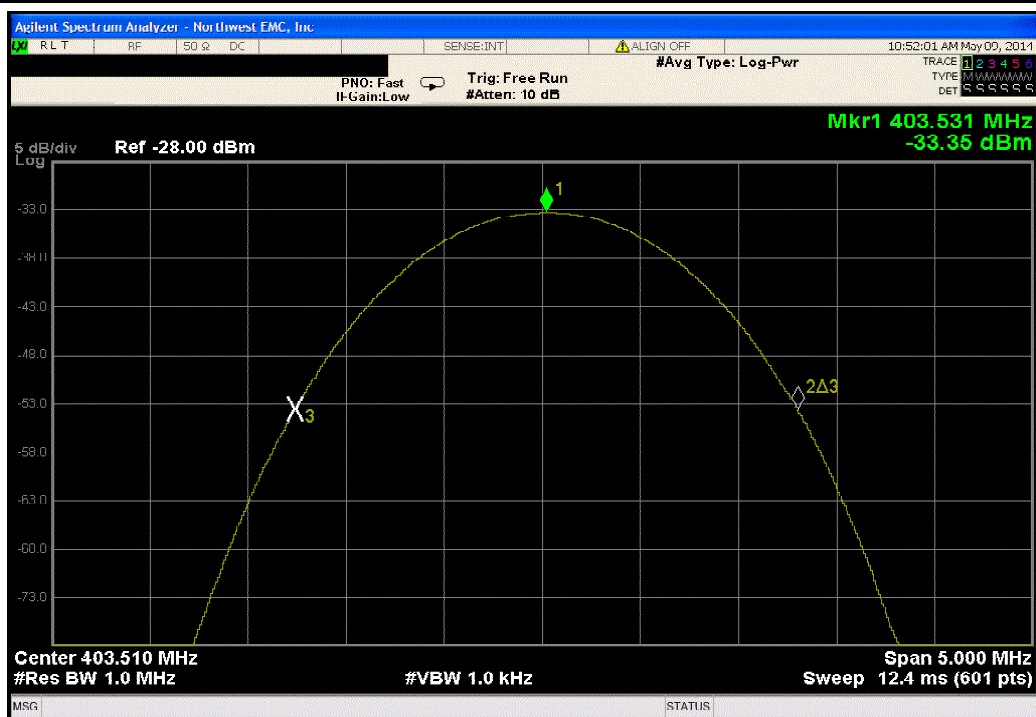
Extreme Temperature +55°C, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



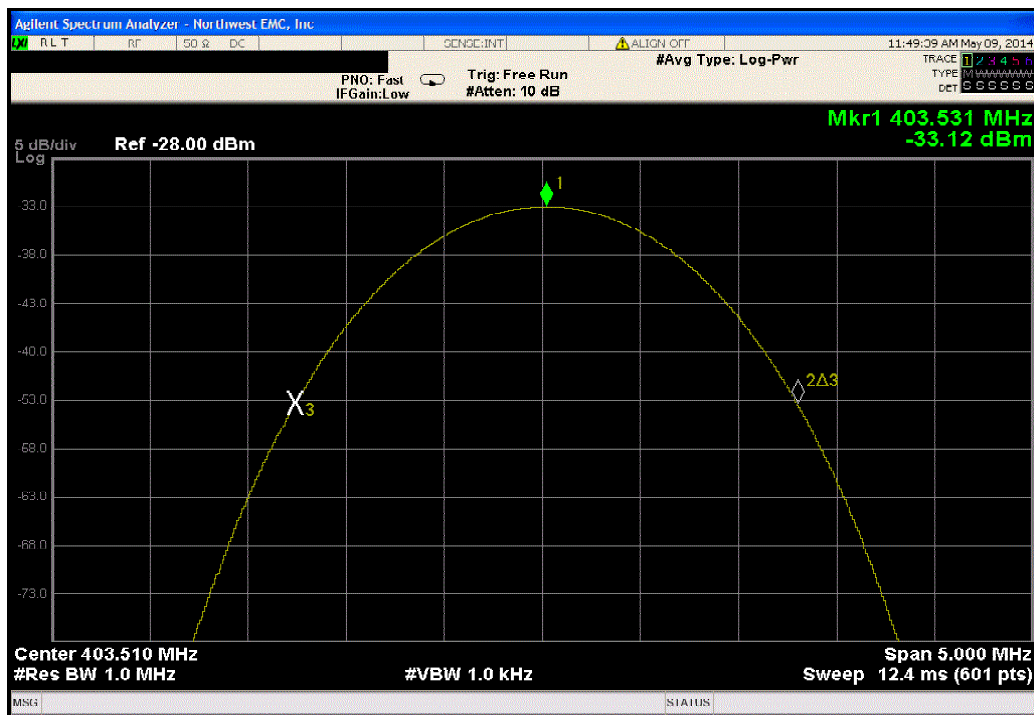
Extreme Temperature +50°C, 403.5 MHz					
Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result	
403.5308333	403.51	51.6	100	Pass	



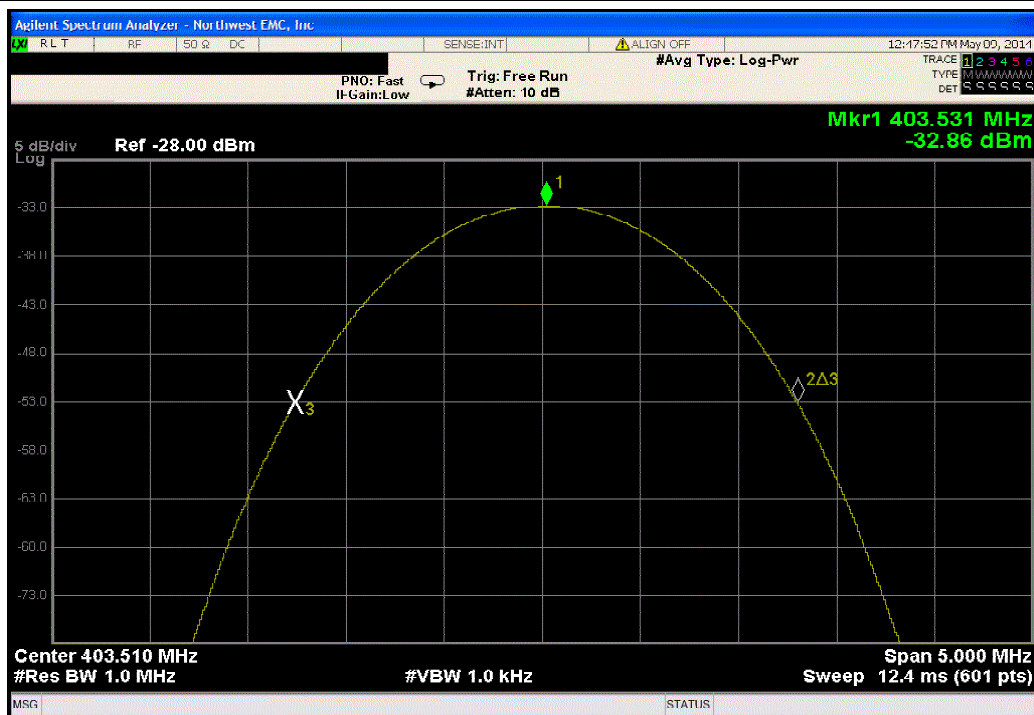
Extreme Temperature +40°C, 403.5 MHz					
Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result	
403.5308333	403.51	51.6	100	Pass	



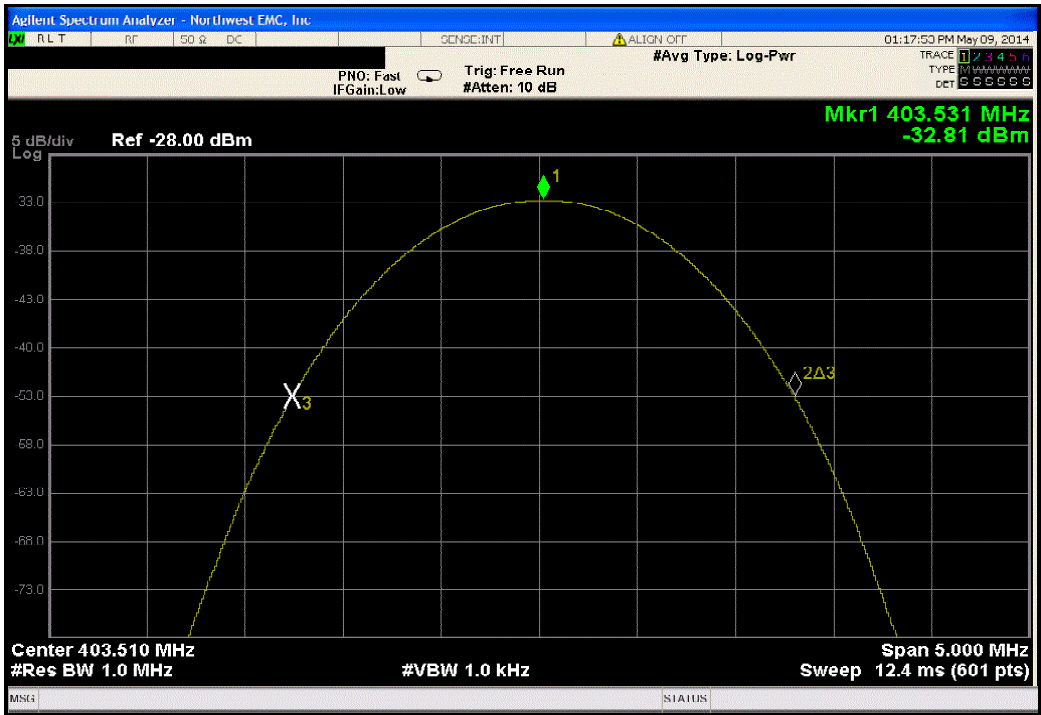
Extreme Temperature +30°C, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



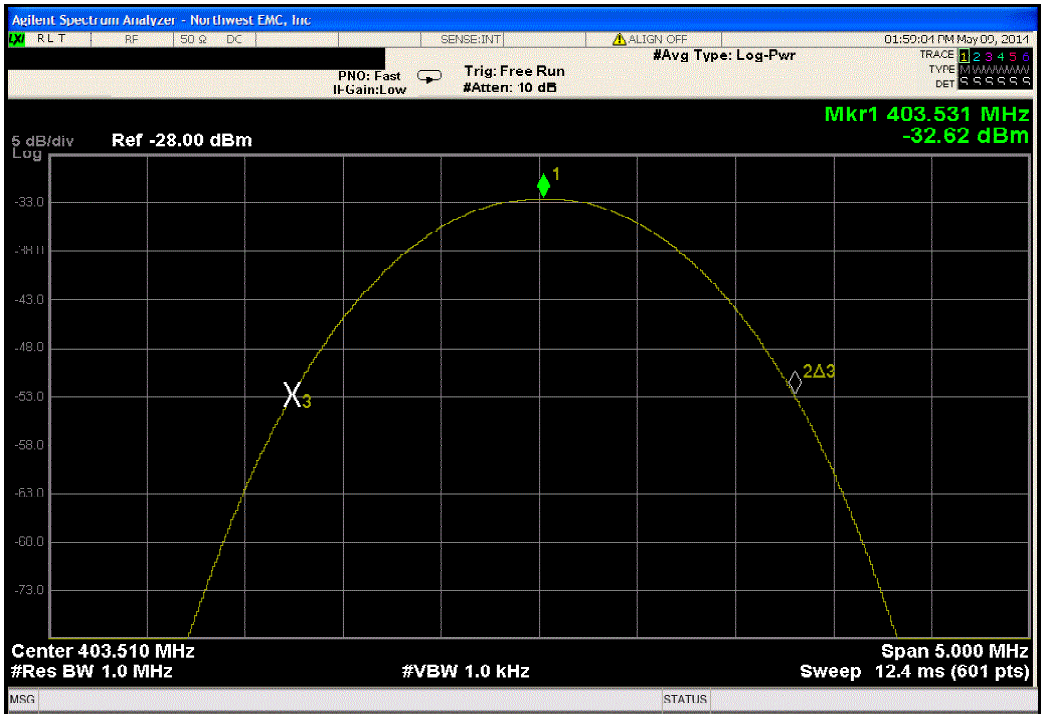
Extreme Temperature +20°C, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



Extreme Temperature +10°C, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



Extreme Temperature 0°C, 403.5 MHz					
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
	403.5308333	403.51	51.6	100	Pass



RADIATED POWER (EIRP)

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 CW at 403.5 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

BSTN0474 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	402 MHz	Stop Frequency	405 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
Antenna, Bilog	Teseg	CBL 6141B	AYD	12/17/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 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

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 $EIRP = W$.

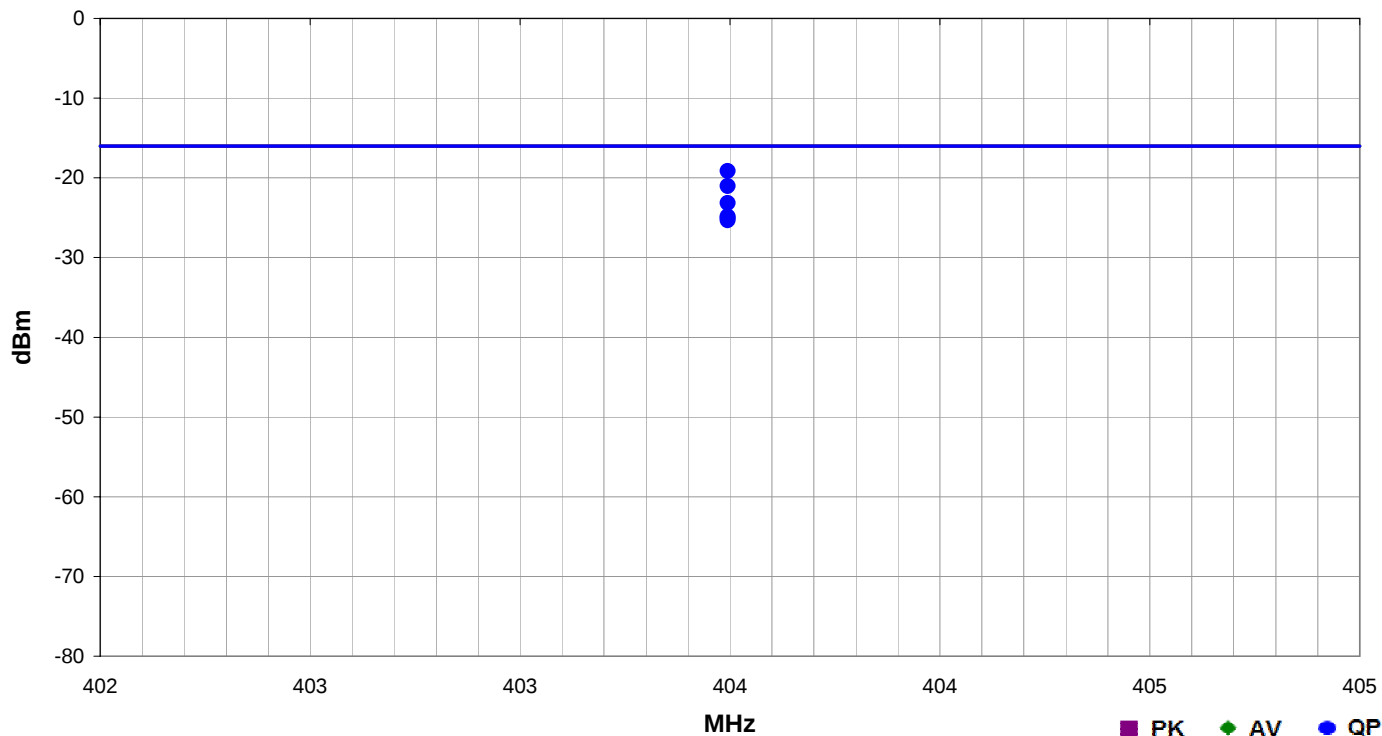
The Field Strength of the Fundamental was measured in the far-field at an FCC Listed Semi-anechoic Chamber. Spectrum analyzer and linearly polarized antennas were used to measure the radiated field strength of the fundamental.

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:	BSTN0474	Date:	05/07/14	<i>Trevor Buls</i>
Project:	None	Temperature:	23.1 °C	
Job Site:	MN05	Humidity:	33.9% RH	
Serial Number:	3200-A103233	Barometric Pres.:	1011.8 mbar	
EUT:	Emblem S-ICD Programmer			
Configuration:	1			
Customer:	Boston Scientific Corporation			
Attendees:	Pete Musto			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting CW at 403.5 MHz			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 95I:2014	ANSI/TIA/EIA-603-C:2004

Run #	1	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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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
	403.495	1.0	110.0	Horz	QP	1.22E-05	-19.1	-16.0	-3.1	EUT Horizontal
	403.495	1.0	204.0	Horz	QP	7.86E-06	-21.0	-16.0	-5.0	EUT on Side
	403.495	1.0	81.0	Horz	QP	4.85E-06	-23.1	-16.0	-7.1	EUT Vertical
	403.495	1.1	144.0	Vert	QP	3.28E-06	-24.8	-16.0	-8.8	EUT on Side
	403.495	2.4	87.0	Vert	QP	3.13E-06	-25.0	-16.0	-9.0	EUT Horizontal
	403.495	1.0	121.0	Vert	QP	2.92E-06	-25.3	-16.0	-9.3	EUT Vertical

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

MODES OF OPERATION

Transmitting modulated at 403.5 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

BSTN0474 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	5 GHz
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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
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	36 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	3/14/2014	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/14/2014	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/14/2014	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 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

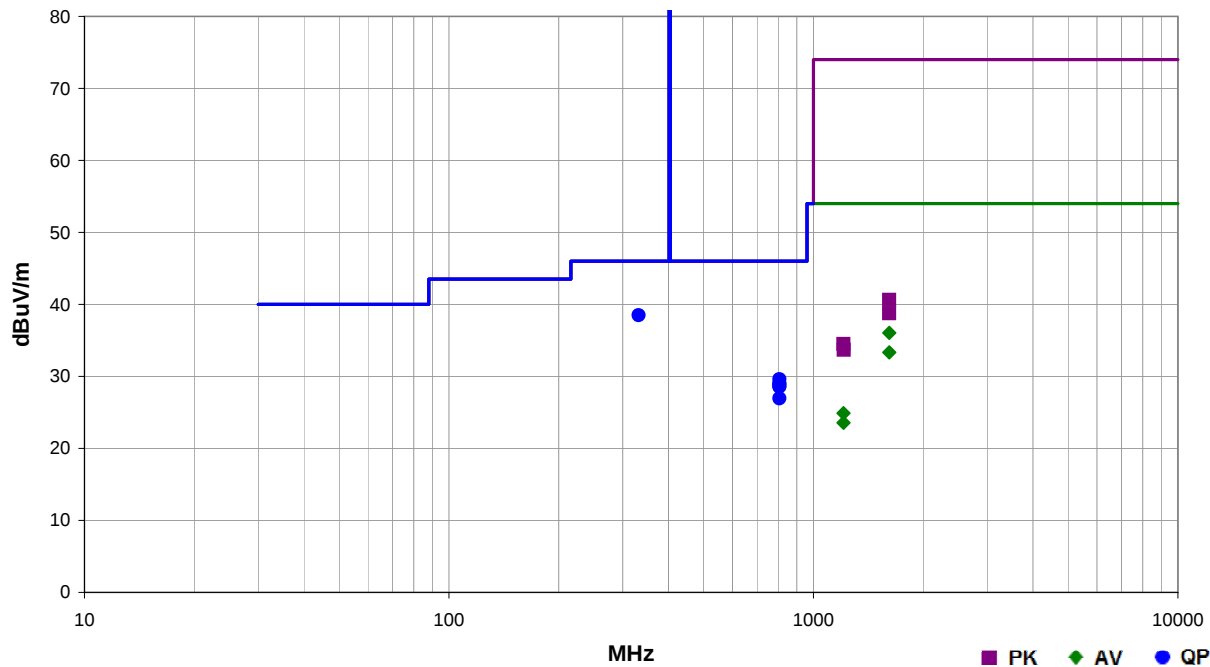
TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for mid band transmit frequencies. 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.

Work Order:	BSTN0474	Date:	05/08/14	<i>Trevor Buls</i>
Project:	None	Temperature:	23.1 °C	
Job Site:	MN05	Humidity:	40.1% RH	
Serial Number:	3200-A103233	Barometric Pres.:	1008.4 mbar	
EUT: Emblem S-ICD Programmer				Tested by: Trevor Buls
Configuration:	1			
Customer:	Boston Scientific Corporation			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting modulated at 403.5 MHz			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 951:2014	ANSI/TIA/EIA-603-C:2004

Run #	14	Test Distance (m)	3	Antenna Height(s)	1-4m	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)	Comments
331.753	40.5	-2.0	1.0	232.0	3.0	0.0	Horz	QP	0.0	38.5	46.0	-7.5	EUT Horizontal
806.413	21.2	8.4	1.0	144.0	3.0	0.0	Horz	QP	0.0	29.6	46.0	-16.4	EUT Vertical
806.402	20.6	8.4	1.0	360.0	3.0	0.0	Horz	QP	0.0	29.0	46.0	-17.0	EUT on Side
806.407	20.5	8.4	1.0	199.0	3.0	0.0	Vert	QP	0.0	28.9	46.0	-17.1	EUT Vertical
807.690	20.2	8.4	1.1	228.0	3.0	0.0	Vert	QP	0.0	28.6	46.0	-17.4	EUT on Side
806.402	20.1	8.4	1.0	85.0	3.0	0.0	Horz	QP	0.0	28.5	46.0	-17.5	EUT Horizontal
1614.075	41.3	-5.3	1.0	281.0	3.0	0.0	Vert	AV	0.0	36.0	54.0	-18.0	EUT Vertical
806.402	18.5	8.4	1.0	22.0	3.0	0.0	Vert	QP	0.0	26.9	46.0	-19.1	EUT Horizontal
1614.008	38.6	-5.3	1.0	117.0	3.0	0.0	Horz	AV	0.0	33.3	54.0	-20.7	EUT Horizontal
1209.125	31.3	-6.4	1.0	256.0	3.0	0.0	Vert	AV	0.0	24.9	54.0	-29.1	EUT Vertical
1209.142	30.0	-6.4	1.0	140.0	3.0	0.0	Horz	AV	0.0	23.6	54.0	-30.4	EUT Horizontal
1614.008	45.9	-5.3	1.0	281.0	3.0	0.0	Vert	PK	0.0	40.6	74.0	-33.4	EUT Vertical
1613.967	44.0	-5.3	1.0	117.0	3.0	0.0	Horz	PK	0.0	38.7	74.0	-35.3	EUT Horizontal
1209.292	40.9	-6.4	1.0	256.0	3.0	0.0	Vert	PK	0.0	34.5	74.0	-39.5	EUT Vertical
1211.475	40.1	-6.4	1.0	140.0	3.0	0.0	Horz	PK	0.0	33.7	74.0	-40.3	EUT Horizontal

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 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50 Ω .

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AAX	04/28/2014	24 mo
MN03 Cables	ESM Cable Corp.	Conducted Cables	MNC	12/05/2013	12 mo
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	05/24/2013	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HGN	05/31/2012	24 mo
Attenuator 20dB, BNC	Fairview Microwave	SA01B-20	AQP	08/09/2013	12 mo

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.94 dB	-2.94 dB

CONFIGURATIONS INVESTIGATED

BSTN0474-1

MODES INVESTIGATED

Transmitting modulated at 403.5 MHz

EUT:	Emblem S-ICD Programmer	Work Order:	BSTN0474
Serial Number:	3200-A103233	Date:	05/12/2014
Customer:	Boston Scientific Corporation	Temperature:	23.2°C
Attendees:	None	Relative Humidity:	47.4%
Customer Project:	None	Bar. Pressure:	1009.4 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	BSTN0474-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2014	ANSI C63.10:2009

TEST PARAMETERS

Run #:	1	Line:	High Line	Ext. Attenuation (dB):	20
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COMMENTS

None

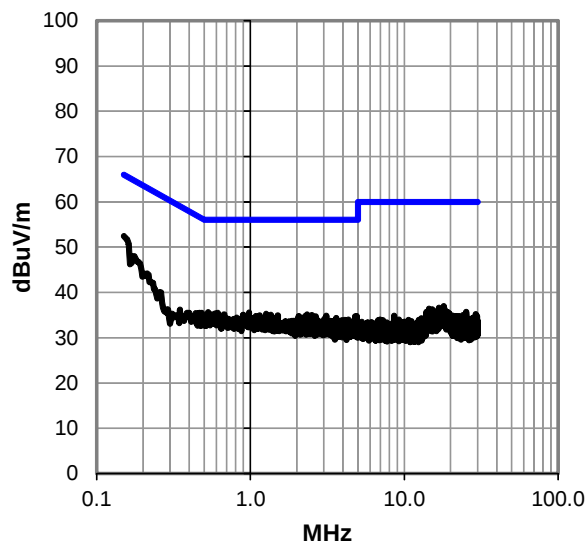
EUT OPERATING MODES

Transmitting modulated at 403.5 MHz

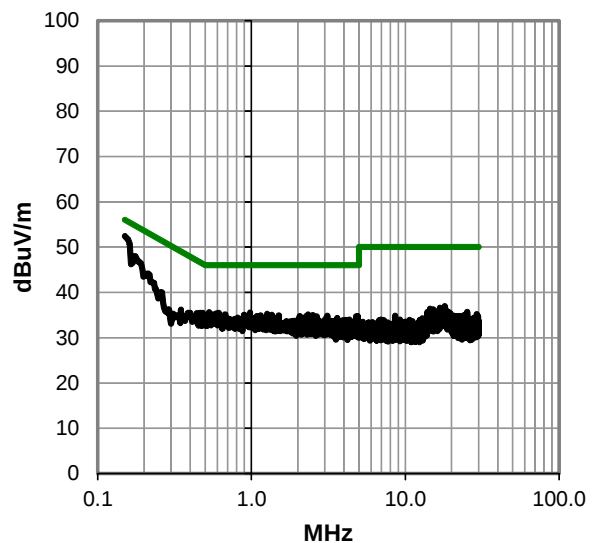
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



RESULTS - Run #1

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Margin (dB)
0.150	32.2	20.2	52.4	66.0	-13.6
0.531	15.4	20.2	35.6	56.0	-20.4
0.978	15.3	20.3	35.6	56.0	-20.4
1.266	15.0	20.3	35.3	56.0	-20.7
0.676	14.9	20.2	35.1	56.0	-20.9
2.333	14.8	20.3	35.1	56.0	-20.9
1.359	14.8	20.3	35.1	56.0	-20.9
2.504	14.7	20.3	35.0	56.0	-21.0
1.146	14.6	20.3	34.9	56.0	-21.1
1.504	14.6	20.3	34.9	56.0	-21.1
3.105	14.5	20.3	34.8	56.0	-21.2
2.265	14.5	20.3	34.8	56.0	-21.2
2.056	14.5	20.3	34.8	56.0	-21.2
4.899	14.4	20.4	34.8	56.0	-21.2
2.653	14.4	20.3	34.7	56.0	-21.3
4.795	14.3	20.4	34.7	56.0	-21.3
3.616	14.0	20.4	34.4	56.0	-21.6
3.019	13.8	20.3	34.1	56.0	-21.9
4.851	13.7	20.4	34.1	56.0	-21.9
4.750	13.6	20.4	34.0	56.0	-22.0
4.325	13.6	20.4	34.0	56.0	-22.0
4.112	13.6	20.4	34.0	56.0	-22.0
3.937	13.5	20.4	33.9	56.0	-22.1
2.765	13.5	20.3	33.8	56.0	-22.2
3.295	13.4	20.3	33.7	56.0	-22.3
3.385	13.3	20.3	33.6	56.0	-22.4

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Margin (dB)
0.150	32.2	20.2	52.4	56.0	-3.6
0.531	15.4	20.2	35.6	46.0	-10.4
0.978	15.3	20.3	35.6	46.0	-10.4
1.266	15.0	20.3	35.3	46.0	-10.7
0.676	14.9	20.2	35.1	46.0	-10.9
2.333	14.8	20.3	35.1	46.0	-10.9
1.359	14.8	20.3	35.1	46.0	-10.9
2.504	14.7	20.3	35.0	46.0	-11.0
1.146	14.6	20.3	34.9	46.0	-11.1
1.504	14.6	20.3	34.9	46.0	-11.1
3.105	14.5	20.3	34.8	46.0	-11.2
2.265	14.5	20.3	34.8	46.0	-11.2
2.056	14.5	20.3	34.8	46.0	-11.2
4.899	14.4	20.4	34.8	46.0	-11.2
2.653	14.4	20.3	34.7	46.0	-11.3
4.795	14.3	20.4	34.7	46.0	-11.3
3.616	14.0	20.4	34.4	46.0	-11.6
3.019	13.8	20.3	34.1	46.0	-11.9
4.851	13.7	20.4	34.1	46.0	-11.9
4.750	13.6	20.4	34.0	46.0	-12.0
4.325	13.6	20.4	34.0	46.0	-12.0
4.112	13.6	20.4	34.0	46.0	-12.0
3.937	13.5	20.4	33.9	46.0	-12.1
2.765	13.5	20.3	33.8	46.0	-12.2
3.295	13.4	20.3	33.7	46.0	-12.3
3.385	13.3	20.3	33.6	46.0	-12.4

CONCLUSION

Pass

Trevor Bults
Tested By

EUT:	Emblem S-ICD Programmer	Work Order:	BSTN0474
Serial Number:	3200-A103233	Date:	05/12/2014
Customer:	Boston Scientific Corporation	Temperature:	23.2°C
Attendees:	None	Relative Humidity:	47.4%
Customer Project:	None	Bar. Pressure:	1009.4 mb
Tested By:	Trevor Buls	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	BSTN0474-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2014	ANSI C63.10:2009

TEST PARAMETERS

Run #:	2	Line:	Neutral	Ext. Attenuation (dB):	20
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COMMENTS

None

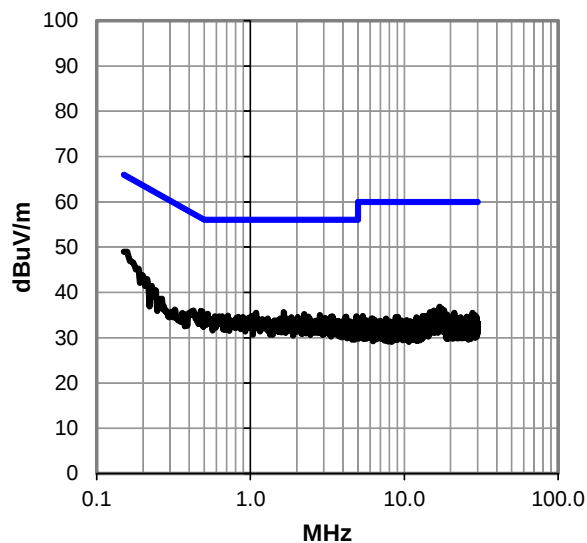
EUT OPERATING MODES

Transmitting modulated at 403.5 MHz

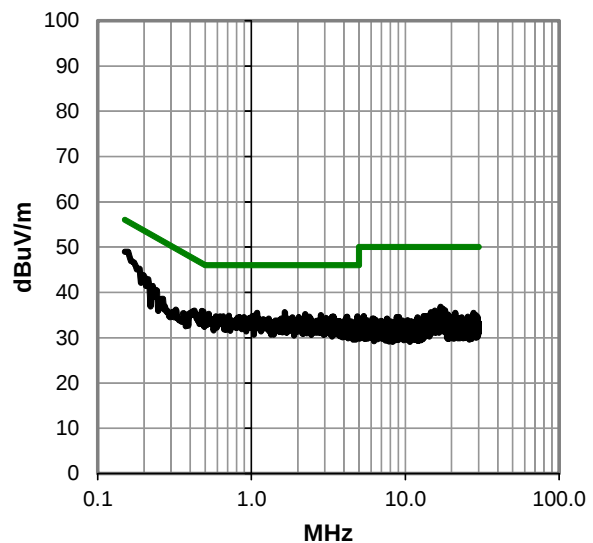
DEVIATIONS FROM TEST STANDARD

None

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



RESULTS - Run #2

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Margin (dB)
0.150	28.8	20.2	49.0	66.0	-17.0
1.646	15.3	20.3	35.6	56.0	-20.4
1.090	15.2	20.3	35.5	56.0	-20.5
2.239	14.9	20.3	35.2	56.0	-20.8
2.832	14.7	20.3	35.0	56.0	-21.0
1.060	14.7	20.3	35.0	56.0	-21.0
0.228	21.2	20.2	41.4	62.5	-21.1
0.713	14.6	20.2	34.8	56.0	-21.2
1.012	14.5	20.3	34.8	56.0	-21.2
3.396	14.4	20.3	34.7	56.0	-21.3
4.888	14.3	20.4	34.7	56.0	-21.3
4.187	14.3	20.4	34.7	56.0	-21.3
0.426	15.8	20.2	36.0	57.3	-21.3
2.381	14.3	20.3	34.6	56.0	-21.4
2.034	14.3	20.3	34.6	56.0	-21.4
4.149	14.2	20.4	34.6	56.0	-21.4
0.836	14.3	20.3	34.6	56.0	-21.4
3.329	14.2	20.3	34.5	56.0	-21.5
1.844	14.2	20.3	34.5	56.0	-21.5
4.937	14.1	20.4	34.5	56.0	-21.5
3.045	14.0	20.3	34.3	56.0	-21.7
2.426	13.9	20.3	34.2	56.0	-21.8
1.560	13.9	20.3	34.2	56.0	-21.8
3.220	13.7	20.3	34.0	56.0	-22.0
3.303	13.6	20.3	33.9	56.0	-22.1
3.511	13.5	20.4	33.9	56.0	-22.1

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Margin (dB)
0.150	28.8	20.2	49.0	56.0	-7.0
1.646	15.3	20.3	35.6	46.0	-10.4
1.090	15.2	20.3	35.5	46.0	-10.5
2.239	14.9	20.3	35.2	46.0	-10.8
2.832	14.7	20.3	35.0	46.0	-11.0
1.060	14.7	20.3	35.0	46.0	-11.0
0.228	21.2	20.2	41.4	52.5	-11.1
0.713	14.6	20.2	34.8	46.0	-11.2
1.012	14.5	20.3	34.8	46.0	-11.2
3.396	14.4	20.3	34.7	46.0	-11.3
4.888	14.3	20.4	34.7	46.0	-11.3
4.187	14.3	20.4	34.7	46.0	-11.3
0.426	15.8	20.2	36.0	47.3	-11.3
2.381	14.3	20.3	34.6	46.0	-11.4
2.034	14.3	20.3	34.6	46.0	-11.4
4.149	14.2	20.4	34.6	46.0	-11.4
0.836	14.3	20.3	34.6	46.0	-11.4
3.329	14.2	20.3	34.5	46.0	-11.5
1.844	14.2	20.3	34.5	46.0	-11.5
4.937	14.1	20.4	34.5	46.0	-11.5
3.045	14.0	20.3	34.3	46.0	-11.7
2.426	13.9	20.3	34.2	46.0	-11.8
1.560	13.9	20.3	34.2	46.0	-11.8
3.220	13.7	20.3	34.0	46.0	-12.0
3.303	13.6	20.3	33.9	46.0	-12.1
3.511	13.5	20.4	33.9	46.0	-12.1

CONCLUSION

Pass

Trevor Bults

Tested By