Boston Scientific Corporation

Jaguar Communicator

Report No. BSTN0336

Report Prepared By



www.nwemc.com 1-888-EMI-CERT

© 2011 Northwest EMC, Inc



Certificate of Test Last Date of Test: December 2, 2011 Boston Scientific Corporation Model: Jaguar Communicator

Emissions						
Test Description	Specification	Test Method	Pass/Fail			
Field Strength of Fundamental	FCC 15.249:2011	ANSI C63.10:2009	Pass			
Field Strength of Harmonics	FCC 15.249:2011	ANSI C63.10:2009	Pass			
Field Strength of Harmonics	FCC 15.205:2011	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. 9349 W Broadway Ave. Brooklyn Park, MN 55445

Phone: (763) 425-2281 Fax: (76

Fax: (763) 424-3469

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

Approved By:
Ral Muno
Rod Munro, 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 Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.



Accreditations and Authorizations

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.

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.

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*)

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.

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).



Accreditations and Authorizations

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-3265, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634).*

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).

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

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)

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.

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 339th Ave. SE Sultan, WA 98294 (360) 793-8675

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









Rev 11/17/06

Party Requesting the Test

Company Name:	Boston Scientific Corporation
Address:	4100 Hamline Avenue North
City, State, Zip:	St. Paul, MN 55112-5798
Test Requested By:	Pete Musto
Model:	Jaguar Communicator
First Date of Test:	October 25, 2011
Last Date of Test:	December 2, 2011
Receipt Date of Samples:	October 24, 2011
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

Communicator

Testing Objective:

To demonstrate compliance to FCC 15.249 specifications

CONFIGURATION 1 BSTN0336 & BSTN0350

EUT							
Description	Manufacturer	Model/Part Number	Serial Number				
Jaguar Communicator	Boston Scientific	6498	008				
AC Power Supply	GlobTek, Inc.	GTM41060-1505	0411				

Peripherals in test setup boundary					
Description Manufacturer Model/Part Number Serial Number					
Bluetooth Dongle	Delta Mobile Systems, Inc.	DM210	None		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Power Cord	No	1.9m	Yes	EUT	AC Mains
RJ11 Cable (2)	No	2.2m	No	EUT	Unterminated
USB Cable	Yes	1.9m	No	EUT	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 2 BSTN0336

EUT							
Description	Manufacturer	Model/Part Number	Serial Number				
Jaguar Communicator	Boston Scientific	6498	008				
AC Power Supply	GlobTek, Inc.	GTM41060-1505	0411				

Cables						
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2	
Power Cord	No	1.9m	Yes	EUT	AC Mains	
RJ11 Cable (2)	No	2.2m	No	EUT	Unterminated	
USB Cable	Yes	1.9m	No	EUT	Unterminated	
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	10/25/2011	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.		
2	12/2/2011	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.		
3	12/2/2011	Field Strength of Harmonics	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.		

EMC

Field Strength of Fundamental

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: 916.5 MHz, ISM band, (transmitting all ones)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

BSTN0350 - 1

Start Frequency	902 MHz	Stop Frequency	928 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, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24 mo			
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12 mo			
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12 mo			

MEASUREMENT BANDWIDTHS

(MHz)	(kHz)		
	(Kr1Z)	(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
	0.15 - 30.0 30.0 - 1000 Above 1000	0.15 - 30.0 10.0 30.0 - 1000 100.0 Above 1000 1000.0	0.15 - 30.0 10.0 9.0 30.0 - 1000 100.0 120.0

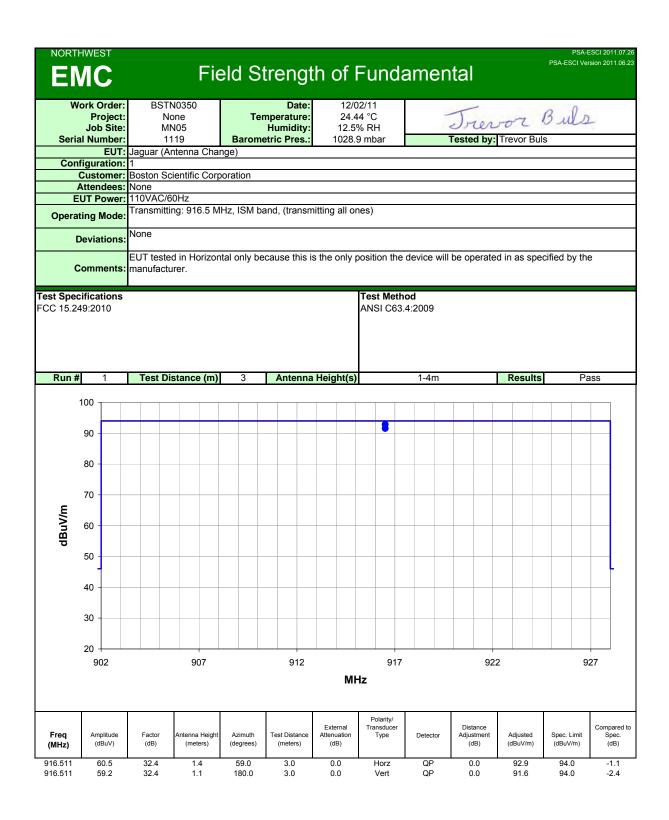
FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

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

The highest gain antenna to be used with the EUT was tested during final measurements. The EUT was transmitting and while set at the only channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009).



EMC

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: 916.5 MHz, ISM band, (transmitting pseudo random data)

POWER SETTINGS INVESTIGATED 110VAC/60Hz

CONFIGURATIONS INVESTIGATED

BSTN0350 - 1

 FREQUENCY RANGE INVESTIGATED

 Start Frequency
 30 MHz
 Stop Frequency
 10 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
Attenuator, 20 dB, 'SMA'	SM Electronics	SA6-20	REO	7/1/2011	12 mo
Attenuator, 10db, 'SMA'	S.M. Electronics	SA18H-10	REN	7/1/2011	12 mo
Low Pass Filter 0-425 MHz	Micro-Tronics	LPM50003	HGO	7/9/2010	24 mo
High Pass Filter	Micro-Tronics	HPM50108	HGP	7/9/2010	24 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	7/1/2011	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	7/1/2011	12 mo
Antenna, Horn	ETS	3160-07	AXP	NCR	0 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	7/1/2011	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	24 mo
MN05 Cables	ESM Cable Corp.	DRG Horn Cables	MNI	10/18/2011	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12 mo
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24 mo
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12 mo

MEASUREMENT BANDWIDTHS

MEAGONEMENT							
	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 we	ere made using the IF bandwi	dths and detectors specified.	No video filter was used, exc	cept in the case of the FCC			
Average Measure	ements above 1GHz. In that c	ase, a peak detector with a 1	0Hz video bandwidth was use	ed.			

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

The highest gain antenna to be used with the EUT was tested during final measurements. The EUT was transmitting and receiving while set at the only channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

				F	ield	Stren	gth o	f Harr	nonic	S			ESCI 2011.07.26 rrsion 2011.06.23
	F Jo	Order: Project: ob Site: umber:	No MN 11	N0350 one N05 19	Baro	Date: emperature: Humidity: metric Pres.:	24. 12.5	02/11 44 °C 5% RH .9 mbar		Jren Tested by:	Trevor Bul		2
Cor		ration:	1	ntenna Char									
	Atte	ndees:	None										
				OVAC/60Hz ansmitting: 916.5 MHz, ISM band, (transmitting pseudo random data)									
		Mode:	None										
			EUT testeo manufactu		tal only	because this i	s the only	position the	device will	be operate	d in as spe	cified by th	e
Test Spe FCC 15.2								Test Meth ANSI C63					
Run #	¥	4	Test Dis	stance (m)	3	Antenna	Height(s)	1-4m		Results	Pa	ass
	80 ·	1											
	70 -												
	60 ·												
E	50 ·												
dBuV/m	40				_								
dE	30 -												
	50				•		•	•					
	20 ·												
	10 ·												
	0 -												
	10	000					MF	Iz					10000
Freq (MHz)		mplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees		External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
3668.425 3668.383 2747.050 2747.017 1835.467 1835.433 3668.142 3666.883 2748.883 2751.817	_	28.6 28.5 29.0 29.0 27.8 27.8 41.7 41.1 41.7 41.4	0.1 0.1 -2.9 -2.9 -4.9 0.1 0.1 -2.9 -2.8	2.4 3.2 2.1 1.0 2.8 3.2 2.4 2.1 1.0	315.0 77.0 146.0 342.0 225.0 243.0 77.0 315.0 146.0 342.0	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Horz Vert Vert Horz Horz Vert Horz Vert Horz	AV AV AV AV AV AV PK PK PK PK	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	28.7 28.6 26.1 22.9 22.9 41.8 41.2 38.8 38.6	54.0 54.0 54.0 54.0 54.0 54.0 74.0 74.0 74.0 74.0 74.0	-25.3 -25.4 -27.9 -27.9 -31.1 -31.1 -32.2 -32.8 -35.2 -35.4 -37.9
2748.883		41.7	-2.9	2.1	146.0	3.0 3.0 3.0	0.0	Vert	PK	0.0	38.8	74.0	

AC POWERLINE 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.

MODES OF OPERATION

Transmitting: 916.5MHz, ISM band, (transmitting all ones)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

BSTN0336 - 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 Electronics	9252-50-R-24-BNC	LIY	7/5/2011	12 mo
MN03 Cables	ESM Cable Corp.	Conducted Cables	MNC	5/18/2011	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HGN	6/28/2010	24 mo
Attenuator, 20 dB	SM Electronics	SA01B-20	REF	1/3/2011	12 mo
Receiver	Rohde & Schwarz	ESCI	ARG	3/22/2011	12 mo

IEASUREMENT 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 usir	ng the bandwidths and dete	ctors specified No video filter	was used				

measurements were made using the bandwidths and detectors' specified. No video litter wa

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

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 ISM channel in the operational band. The EUT was transmitting at its maximum data rate. The spectrum was then scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

