Spectrum Technology, Inc.

GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth

Report No. SPTE0102 Rev 03

Report Prepared By

NORTHWEST EMC

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

EMC Test Report

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: December 4, 2008
Spectrum Technology, Inc.
Model: GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth

Emissions			
Test Description	**Specification**	**Test Method**	**Pass/Fail**
Occupied Bandwidth	FCC 15.247(FHSS):2008	ANSI C63.4:2003 DA 00-705:2000	**Pass**
Spurious Radiated Emissions	FCC 15.247(FHSS):2008	ANSI C63.4:2003 DA 00-705:2000	**Pass**
Power Spectral Density	FCC 15.247(DTS):2008	ANSI C63.4:2003 KDB No. 558074	**Pass**
Band Edge Compliance	FCC 15.247(DTS):2008	ANSI C63.4:2003 KDB No. 558074	**Pass**
Spurious Conducted Emissions	FCC 15.247(DTS):2008	ANSI C63.4:2003 KDB No. 558074	**Pass**
Output Power	FCC 15.247(DTS):2008	ANSI C63.4:2003 KDB No. 558074	**Pass**
AC Powerline Conducted Emissions	FCC 15.247(DTS):2008	ANSI C63.4:2003 KDB No. 558074	**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.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

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

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

Approved By:

Tim O'Shea, Minnesota Lab Manager

NVLAP Lab Code: 200630-0

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
01	Corrected model name of WLAN radio and changed WiFi to WLAN	2/16/09	1-2,7,12-14,20,28,36,42,63, 71-76
01	Added BT radio Mfg and model number	2/16/09	8-9
02	Added Bluetooth approval document to report	3/2/09	78-82
03	Corrected model name of Bluetooth radio	3/4/09	1-2,7-8,12-14,20,28,36,42,63,71-76

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 United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. 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.

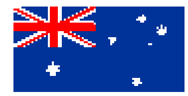
NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 200676-0
NVLAP LAB CODE 200761-0

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)*

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.

NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).

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).



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, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294).*

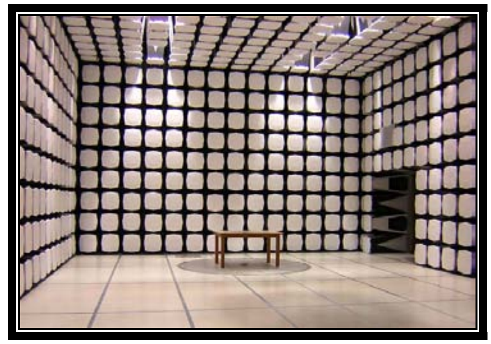
BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017). License No.SL2-IN-E-1017.

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)*

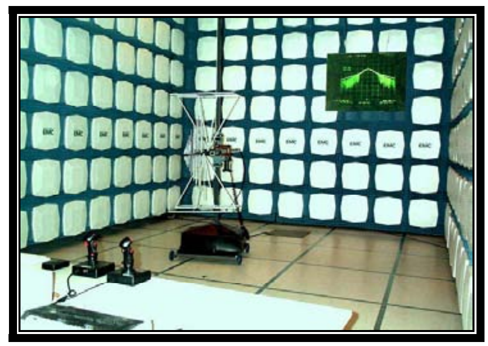
SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/



California – Orange County Facility
Labs OC01 – OC13

41 Tesla Ave. Irvine, CA 92618
(888) 364-2378 Fax: (503) 844-3826



Oregon – Evergreen Facility
Labs EV01 – EV11

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124
(503) 844-4066 Fax: (503) 844-3826

Washington – Sultan Facility
Labs SU01 – SU07

14128 339th Ave. SE Sultan, WA 98294
(888) 364-2378

Party Requesting the Test

Company Name:	Spectrum Technology, Inc.
Address:	4801 166th Place SE
City, State, Zip:	Bothell, WA 98012
Test Requested By:	Rod Munro
Model:	GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth
First Date of Test:	December 2, 2008
Last Date of Test:	December 4, 2008
Receipt Date of Samples:	November 20, 2008
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

The Itronix Model GD8000 is a fully ruggedized PC that can be used in either a notebook or vehicle - mount configuration. The GD8000 has an 802.11(b/g/a/n) WLAN, and Bluetooth 2.0 EDR radio modules.

Testing Objective:

Seeking to demonstrate compliance of the Bluetooth radio under FCC 15.247 for operation in the 2.4 GHz band.

CONFIGURATION 2 SPTE0102

Software/Firmware Running during test	
Description	**Version**
Windows XP	SP3
Blue Test	1.24

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Bluetooth Radio Module	Bluegiga	IX-WT11	unknown
Notebook PC	General Dynamics Itronix, Corp.	GD8000	SY8350000052

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Keyboard	Logitech	Y-UT76	SC7250Z
Headset	Sony	MDR-013	none
Microphone	Gateway	7000981	C19808008
Monitor	IBM	P202	55-70151
Serial Modem	Epson	C202A	010286
AC Adapter	Delta Electronics	ADP-090SB BB	815W89F003C
USB Thumb Drive	ativa	512MB	M204F1
USB Mouse	Dell	M-UK DEL3	HC8090COCNK

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
RJ11 Phone Cable	No	1.9m	No	Notebook PC	Unterminated
USB	PA	1.9m	No	Notebook PC	USB Mouse
AC Power	No	1.8m	No	AC Mains	AC Adapter
DC Power	PA	1.8m	Yes	AC Adapter	Notebook PC
Serial	Yes	1.9m	No	Notebook PC	Serial Modem
Serial	Yes	2.0m	No	Notebook PC	Unterminated
Ethernet	No	1.2m	No	Notebook PC	Unterminated
Video	Yes	1.6m	Yes	Notebook PC	Monitor
AC Power	No	1.8m	No	AC Mains	Monitor
Audio	PA	1.6m	No	Notebook PC	Microphone
Audio	PA	1.1m	No	Notebook PC	Headset
USB	PA	1.8m	No	Notebook PC	USB Keyboard
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 1 SPTE0105

Software/Firmware Running during test	
Description	**Version**
Windows XP	SP3
Blue Test	1.24

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Bluetooth Radio Module	Bluegiga	IX-WT11	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Notebook PC	General Dynamics Itronix, Corp.	GD8000	None
AC Adapter	Delta Electronics	ADP-090SB BB	None
Wireless Mouse	Logitech	None	None
USB Wireless dongle	Logitech	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	1.8m	No	AC Mains	AC Adapter
DC Power	PA	1.8m	Yes	AC Adapter	Notebook PC
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	12/2/2008	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.
2	12/3/2008	Occupied 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.
3	12/3/2008	Band Edge Compliance	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	12/3/2008	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.
5	12/3/2008	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.
6	12/3/2008	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.
7	12/4/2008	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was complete.

OCCUPIED 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
Spectrum Analyzer	Agilent	E4407B	AAU	12/7/2007	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	6/27/2008	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The 20 dB occupied bandwidth was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting in a no hop mode at its maximum data rate for each of the three different modulations available.

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XMit 2007.06.13

OCCUPIED BANDWIDTH

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**			**Work Order:**	**SPTE0105**
Serial Number:	**None**			**Date:**	**12/03/08**
Customer:	**Spectrum Technology, Inc.**			**Temperature:**	**22°C**
Attendees:	**None**			**Humidity:**	**44%**
Project:	**None**			**Barometric Pres.:**	**30.32 in**
Tested by:	**Rod Peloquin**	**Power:**	**120VAC/60Hz**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	Test Method
FCC 15.247 (FHSS):2008	ANSI C63.4:2003 DA 00-705:2000

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

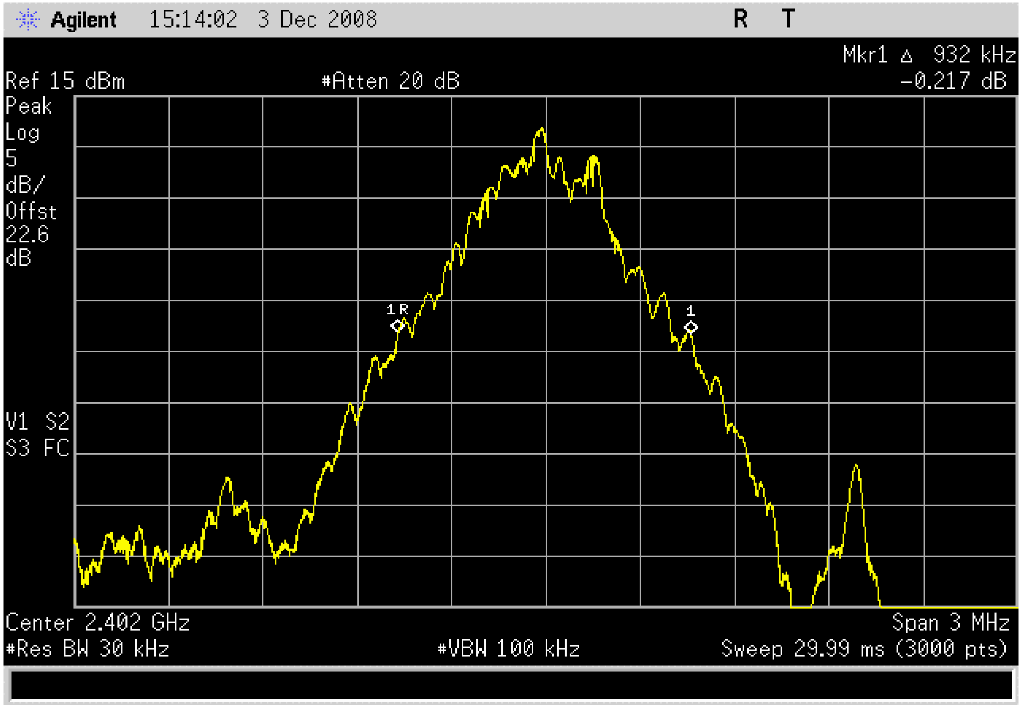
No Deviations

Configuration #	**1**	*Signature*

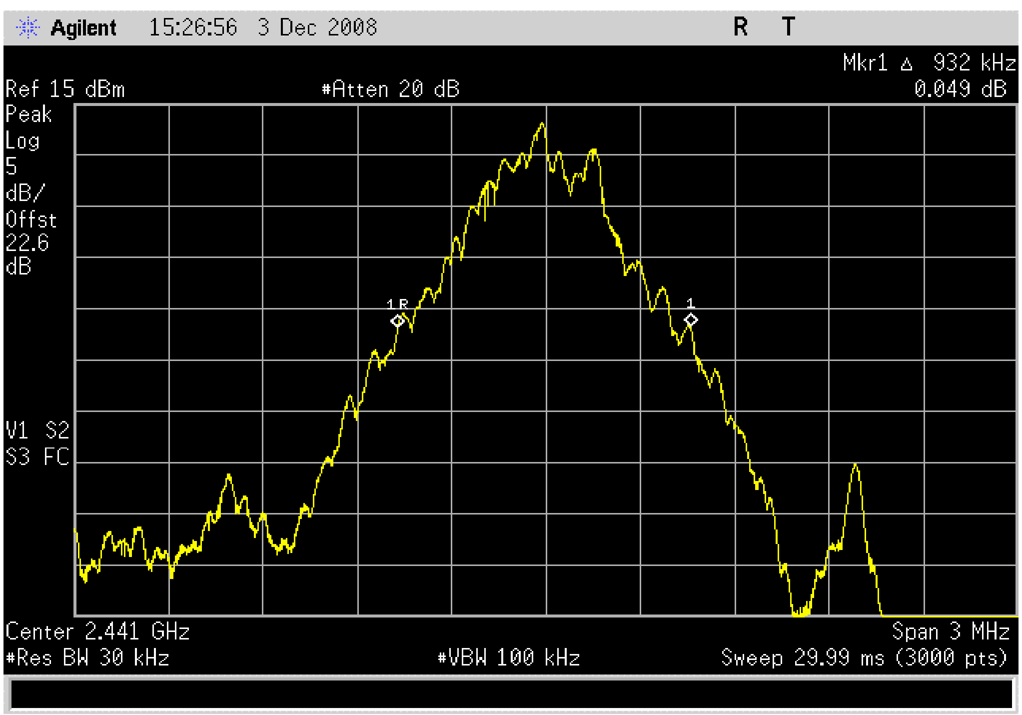
	Value	Limit	Results
Bluetooth, GFSK, DH5, Power (255, 30)			
Low Channel, 2402MHz	932 kHz	1.5 MHz	Pass
Mid Channel, 2441 MHz	932 kHz	1.5 MHz	Pass
High Channel, 2480 MHz	933 kHz	1.5 MHz	Pass
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78)			
Low Channel, 2402MHz	1.203 MHz	1.5 MHz	Pass
Mid Channel, 2441 MHz	1.202 MHz	1.5 MHz	Pass
High Channel, 2480 MHz	1.203 MHz	1.5 MHz	Pass
Bluetooth, 8-DPSK, 3DH5, Power (227, 78)			
Low Channel, 2402MHz	1.252 MHz	1.5 MHz	Pass
Mid Channel, 2441 MHz	1.246 MHz	1.5 MHz	Pass
High Channel, 2480 MHz	1.244 MHz	1.5 MHz	Pass

OCCUPIED BANDWIDTH

Bluetooth, GFSK, DH5, Power (255, 30), Low Channel, 2402MHz					
Result:	Pass	**Value:**	932 kHz	**Limit:**	1.5 MHz

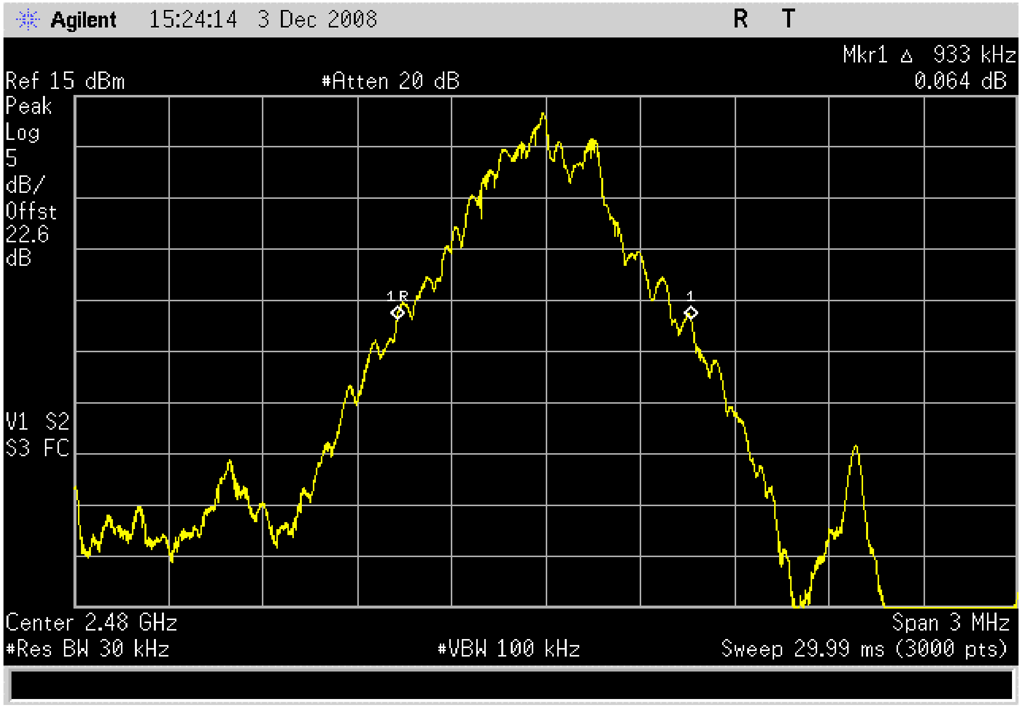


Bluetooth, GFSK, DH5, Power (255, 30), Mid Channel, 2441 MHz					
Result:	Pass	**Value:**	932 kHz	**Limit:**	1.5 MHz

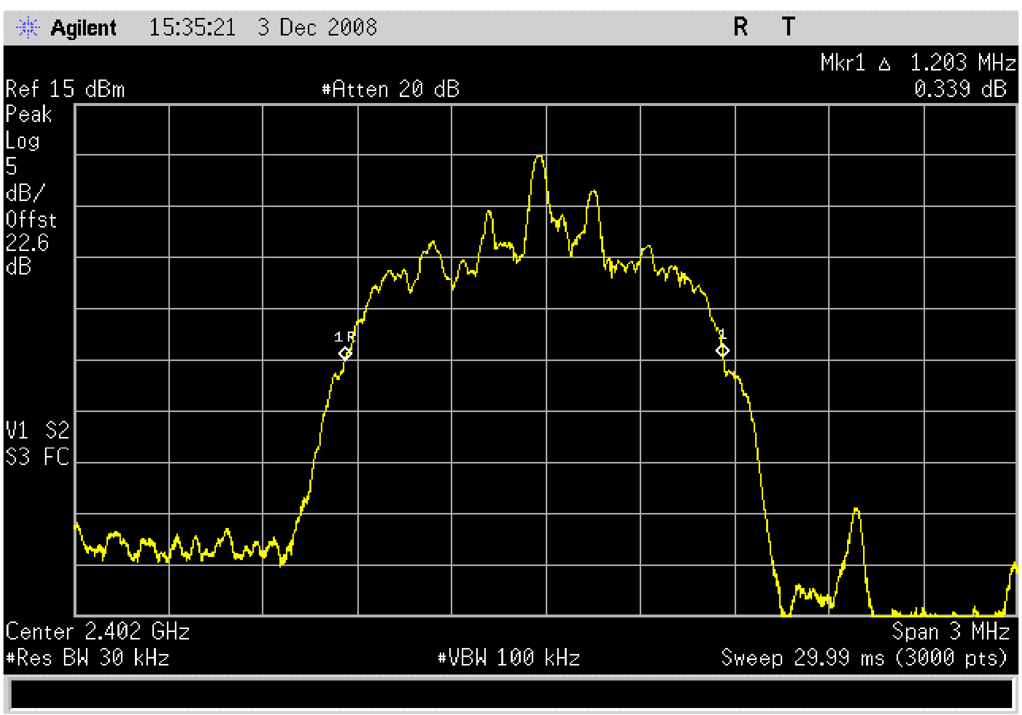


OCCUPIED BANDWIDTH

Bluetooth, GFSK, DH5, Power (255, 30), High Channel, 2480 MHz					
Result:	Pass	**Value:**	933 kHz	**Limit:**	1.5 MHz

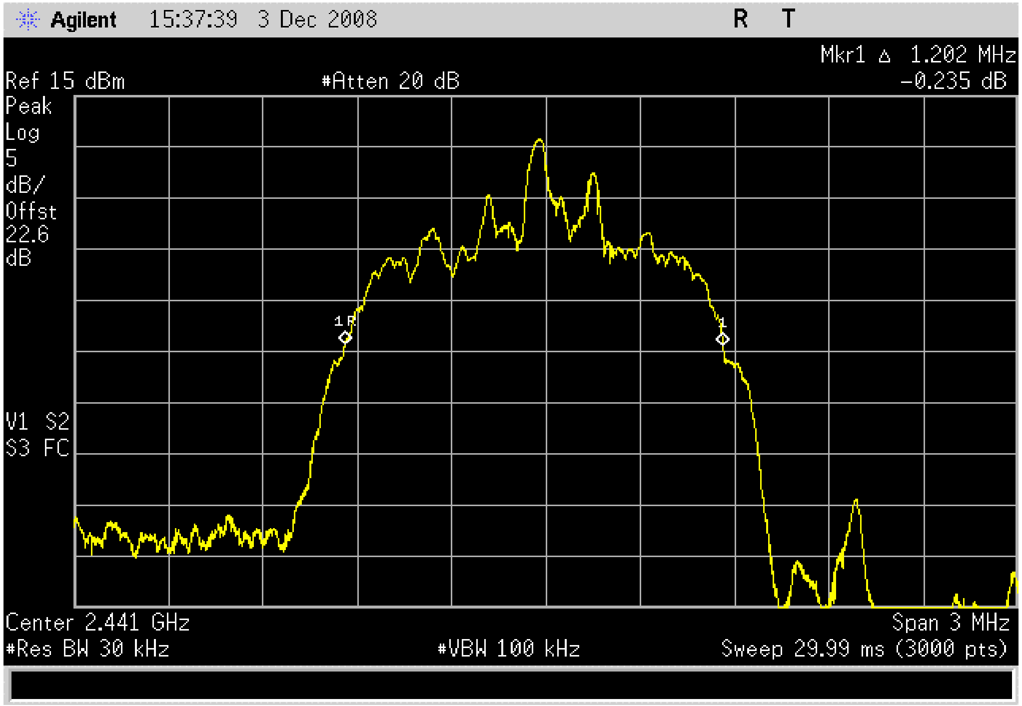


Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel, 2402MHz					
Result:	Pass	**Value:**	1.203 MHz	**Limit:**	1.5 MHz

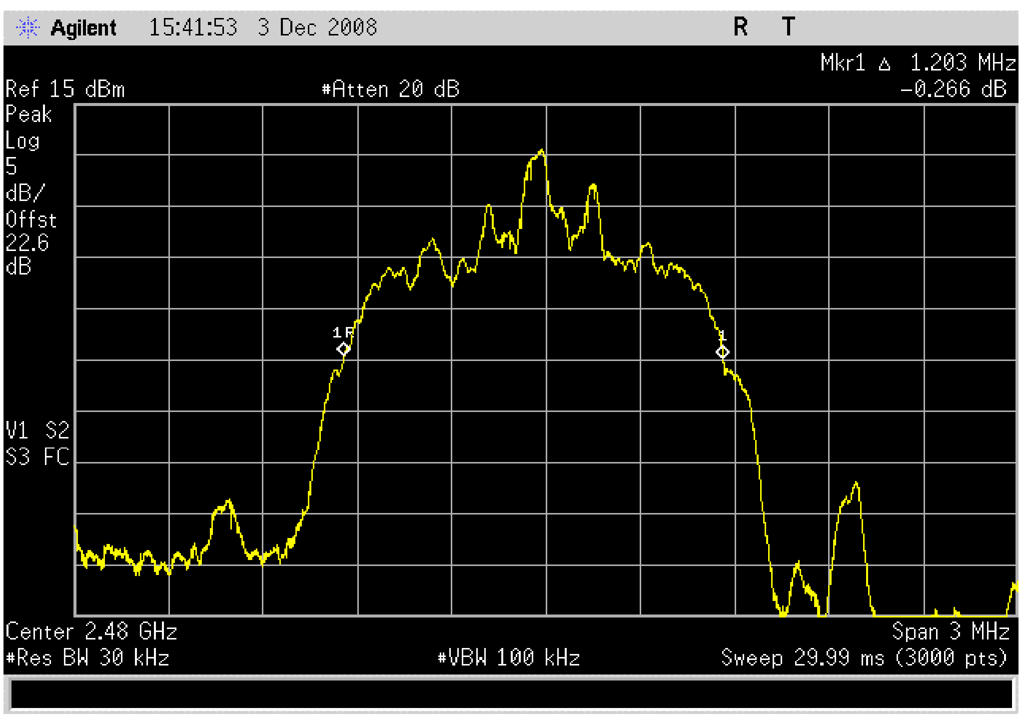


OCCUPIED BANDWIDTH

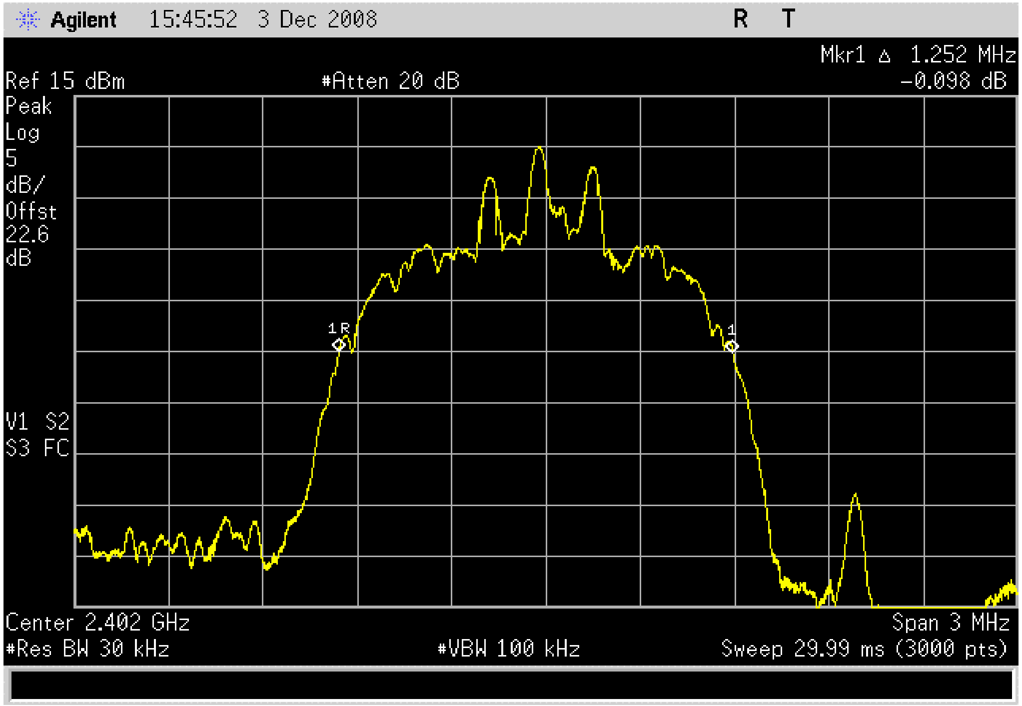
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Mid Channel, 2441 MHz					
Result:	Pass	**Value:**	1.202 MHz	**Limit:**	1.5 MHz



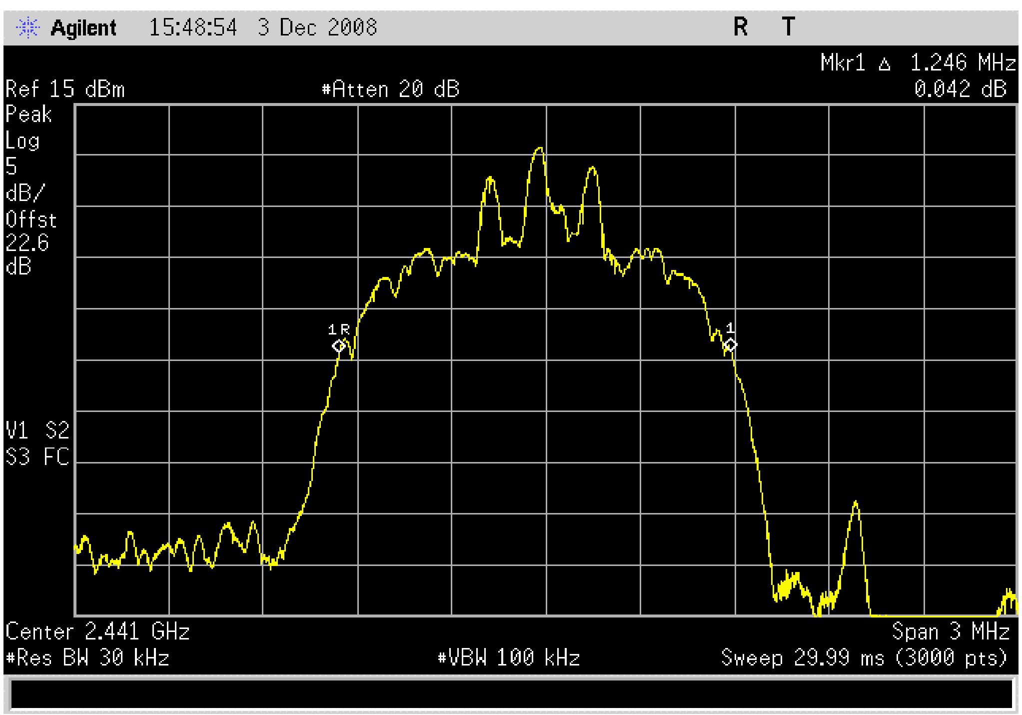
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel, 2480 MHz					
Result:	Pass	**Value:**	1.203 MHz	**Limit:**	1.5 MHz



Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel, 2402MHz					
Result:	Pass	**Value:**	1.252 MHz	**Limit:**	1.5 MHz

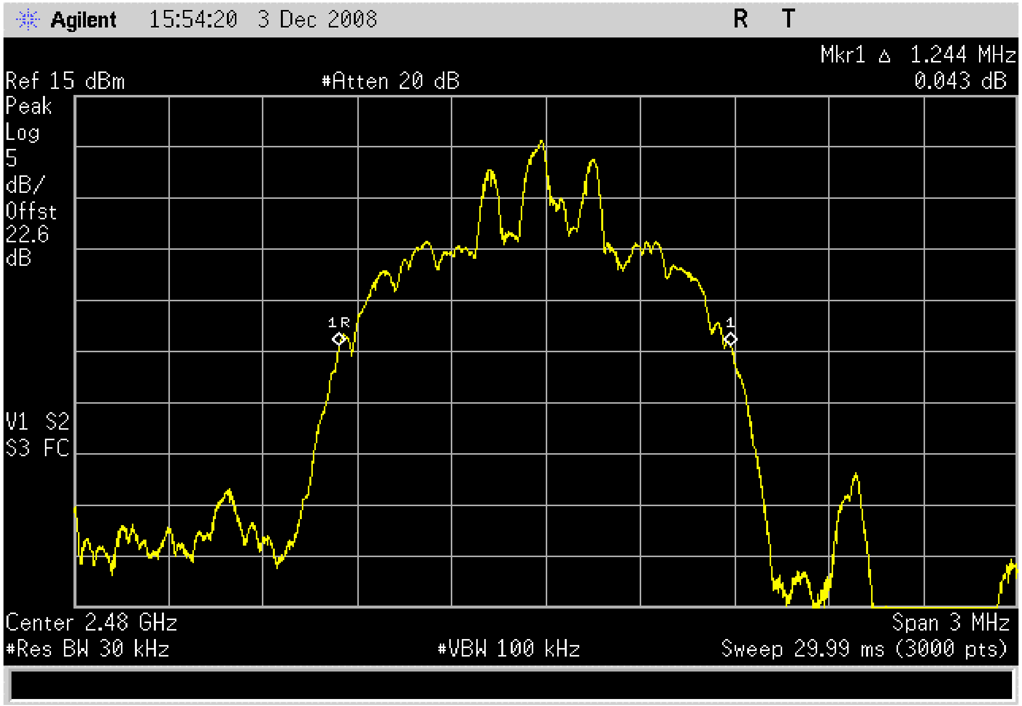


Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Mid Channel, 2441 MHz					
Result:	Pass	**Value:**	1.246 MHz	**Limit:**	1.5 MHz



OCCUPIED BANDWIDTH

Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel, 2480 MHz					
Result:	Pass	**Value:**	1.244 MHz	**Limit:**	1.5 MHz



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
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2007	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	6/27/2008	13
Power Meter	Gigatronics	8651A	SPM	12/7/2007	13
Power Sensor	Gigatronics	80701A	SPL	12/7/2007	13
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2007	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. . The EUT was transmitting in a no hop mode at its maximum data rate for each of the three different modulations available.

NORTHWEST
EMC

OUTPUT POWER

XMit 2007.06.13

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**			**Work Order:**	**SPTE0105**
Serial Number:	**None**			**Date:**	**12/03/08**
Customer:	**Spectrum Technology, Inc.**			**Temperature:**	**22°C**
Attendees:	**None**			**Humidity:**	**44%**
Project:	**None**			**Barometric Pres.:**	**30.32 in**
Tested by:	**Rod Peloquin**	**Power:**	**120VAC/60Hz**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2008	ANSI C63.4:2003 KDB No. 558074

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

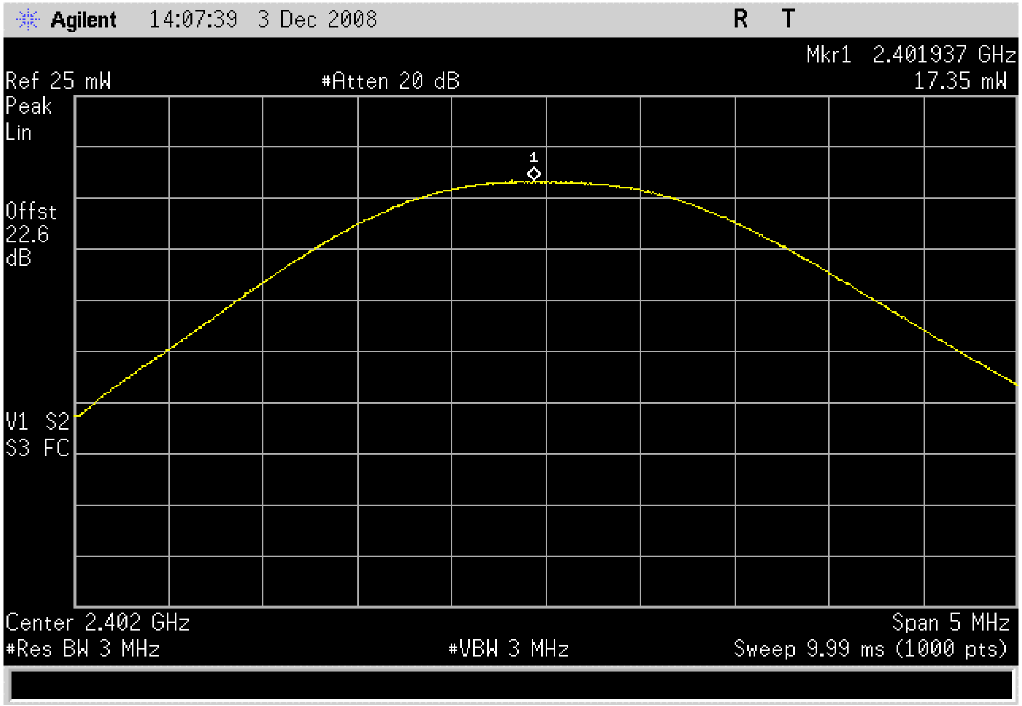
No Deviations

Configuration #	**1**	*Signature*

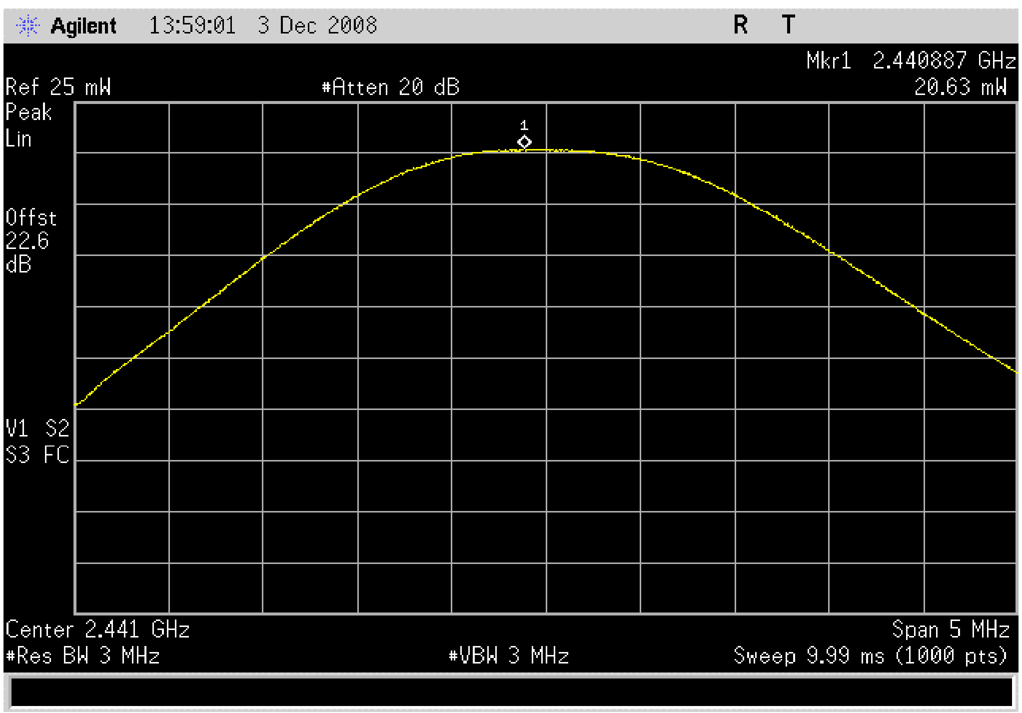
		Value	**Limit**	**Results**
Bluetooth, GFSK, DH5, Power (255, 30)				
	Low Channel	17.35 mW	1 W	Pass
	Mid Channel	20.63 mW	1 W	Pass
	High Channel	21.75 mW	1 W	Pass
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78)				
	Low Channel	10.00 mW	1 W	Pass
	Mid Channel	12.28 mW	1 W	Pass
	High Channel	11.13 mW	1 W	Pass
Bluetooth, 8-DPSK, 3DH5, Power (227, 78)				
	Low Channel	10.28 mW	1 W	Pass
	Mid Channel	12.27 mW	1 W	Pass
	High Channel	11.81 mW	1 W	Pass

OUTPUT POWER

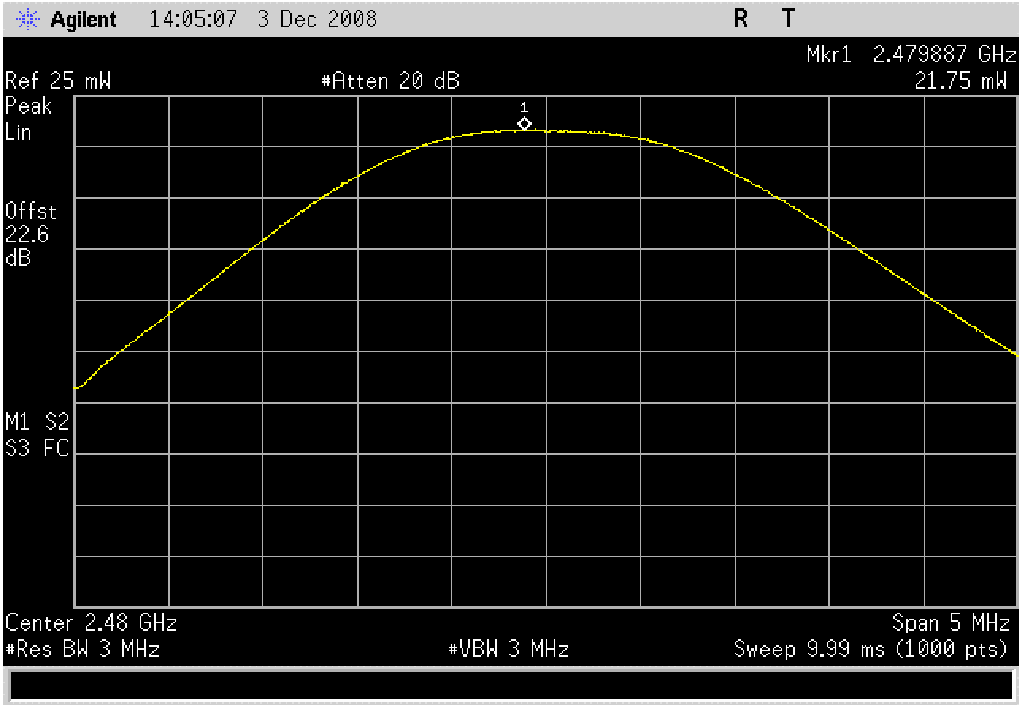
Bluetooth, GFSK, DH5, Power (255, 30), Low Channel					
Result:	Pass	**Value:**	17.35 mW	**Limit:**	1 W



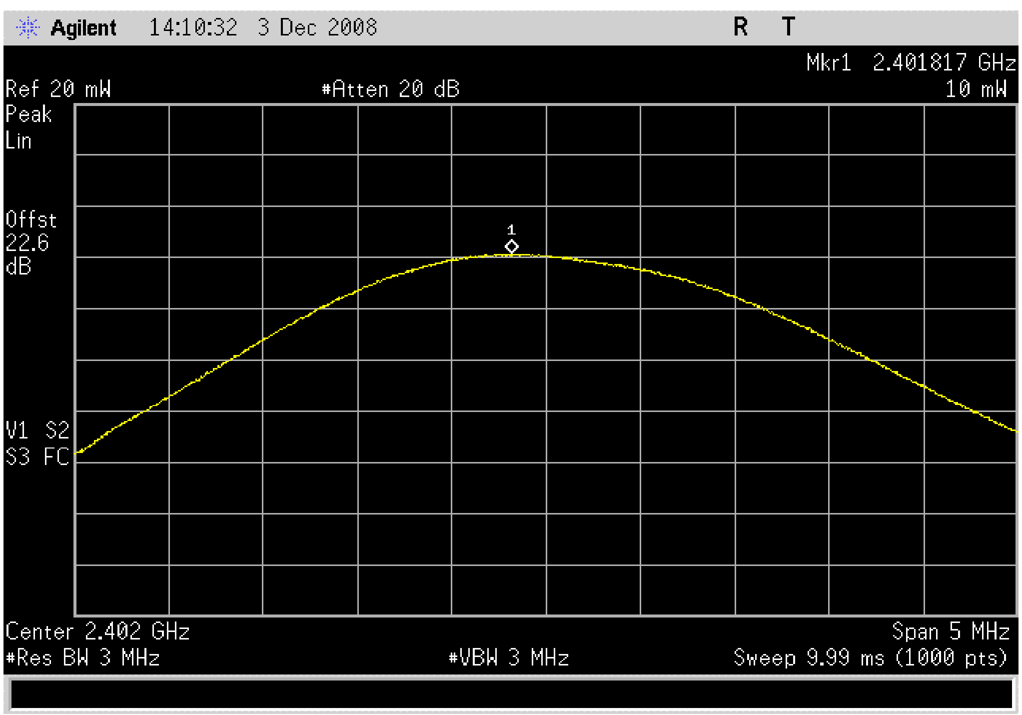
Bluetooth, GFSK, DH5, Power (255, 30), Mid Channel					
Result:	Pass	**Value:**	20.63 mW	**Limit:**	1 W



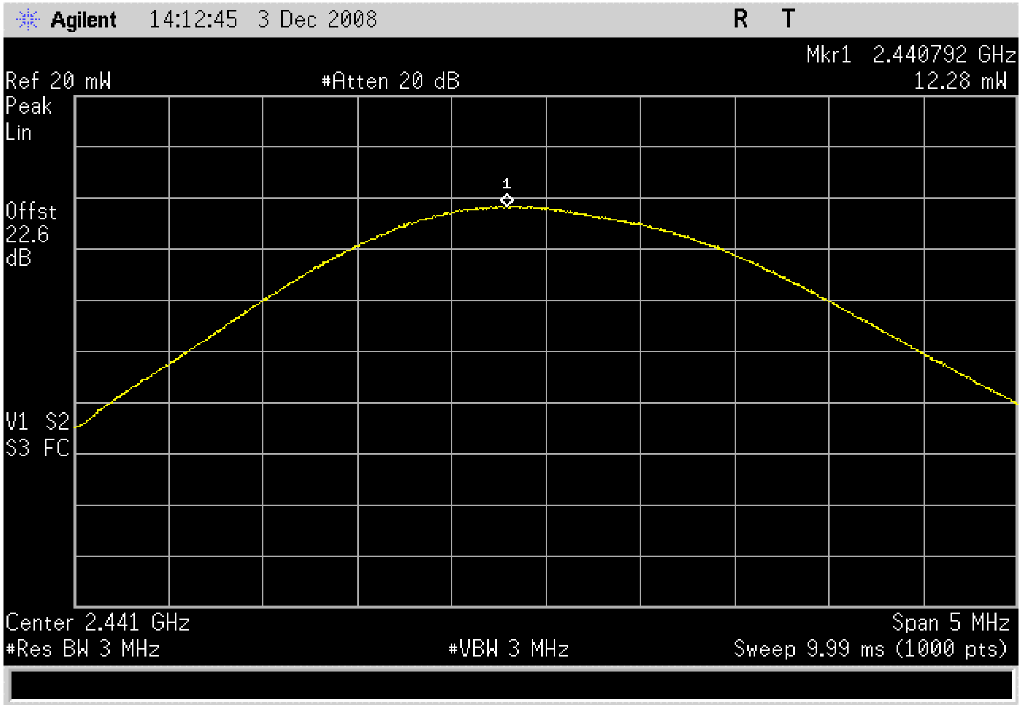
Bluetooth, GFSK, DH5, Power (255, 30), High Channel					
Result:	Pass	**Value:**	21.75 mW	**Limit:**	1 W



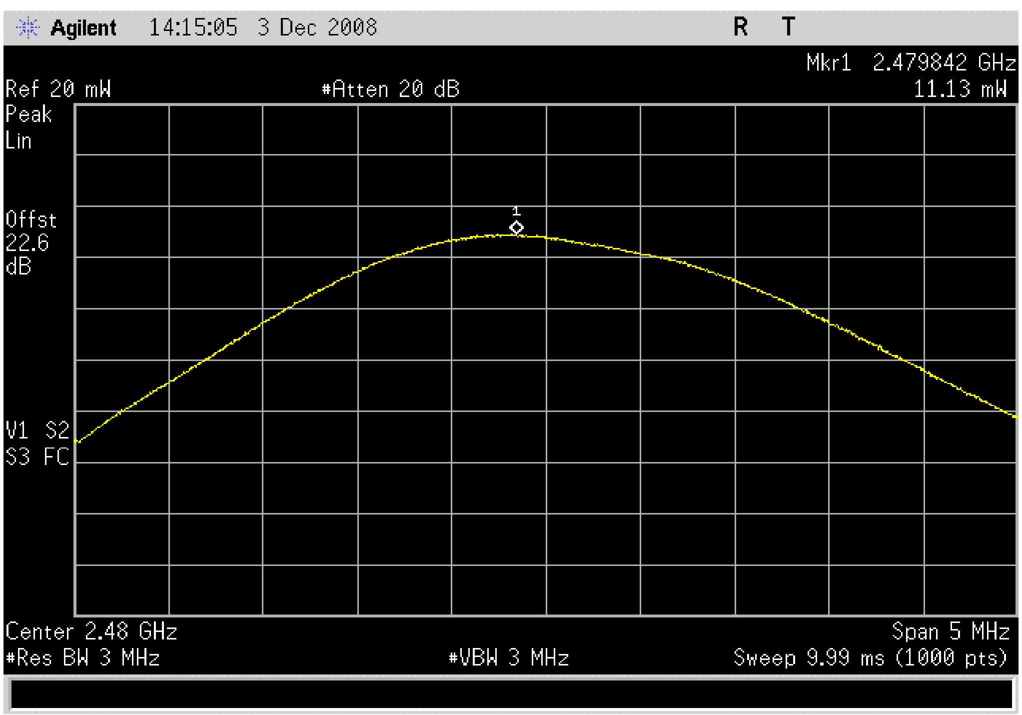
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel					
Result:	Pass	**Value:**	10.00 mW	**Limit:**	1 W



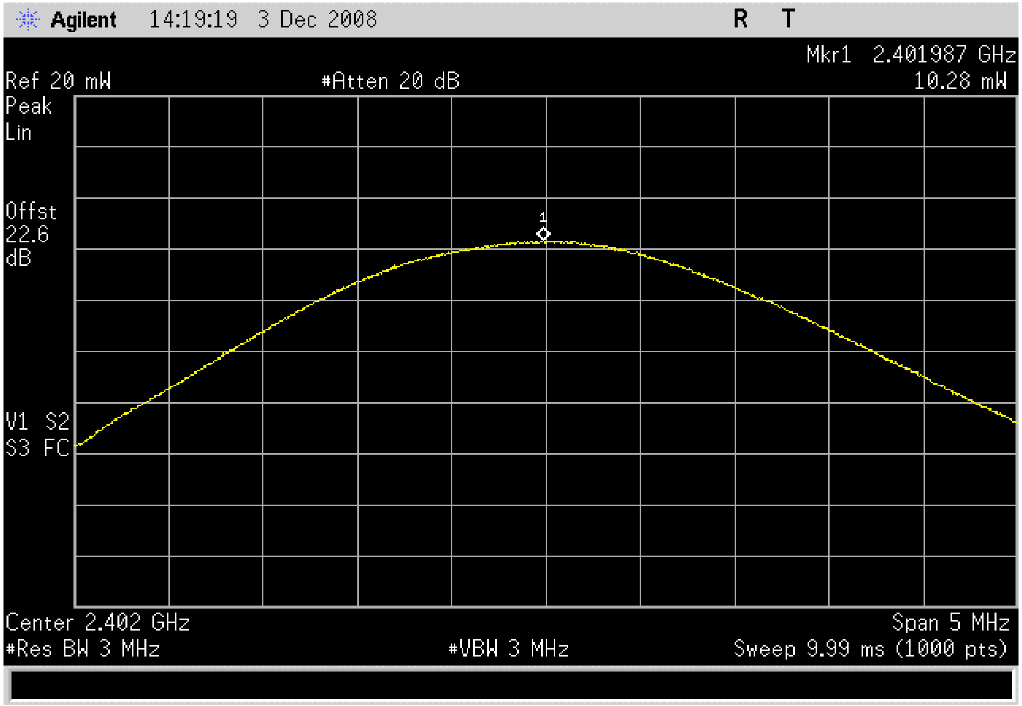
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Mid Channel		
Result: Pass	**Value:** 12.28 mW	**Limit:** 1 W



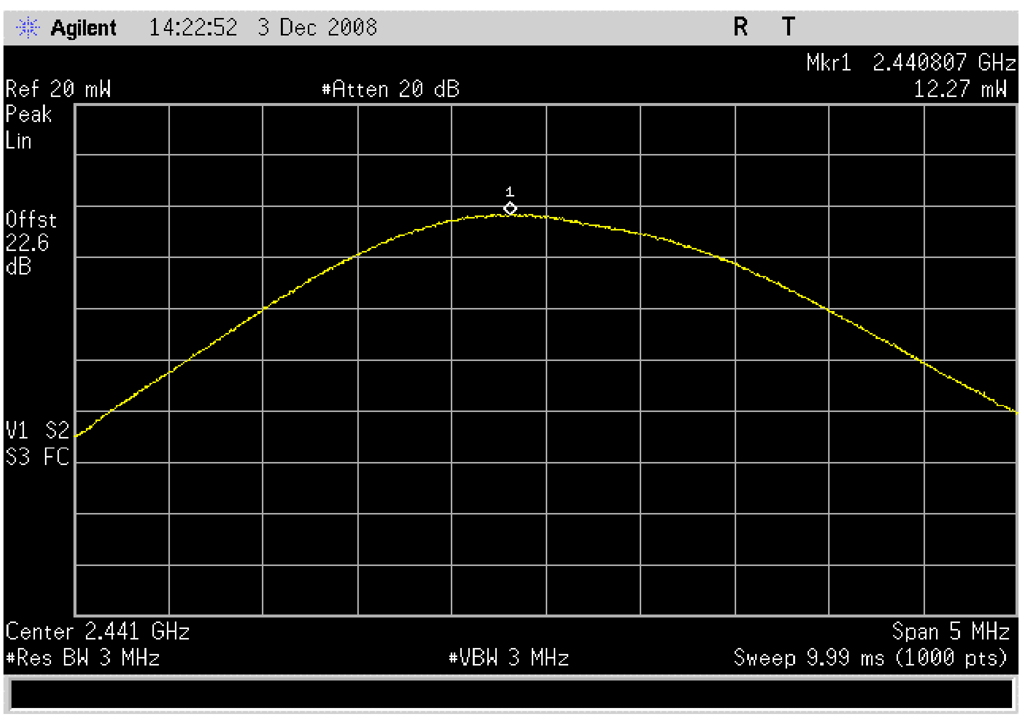
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel		
Result: Pass	**Value:** 11.13 mW	**Limit:** 1 W



Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel					
Result:	Pass	**Value:**	10.28 mW	**Limit:**	1 W

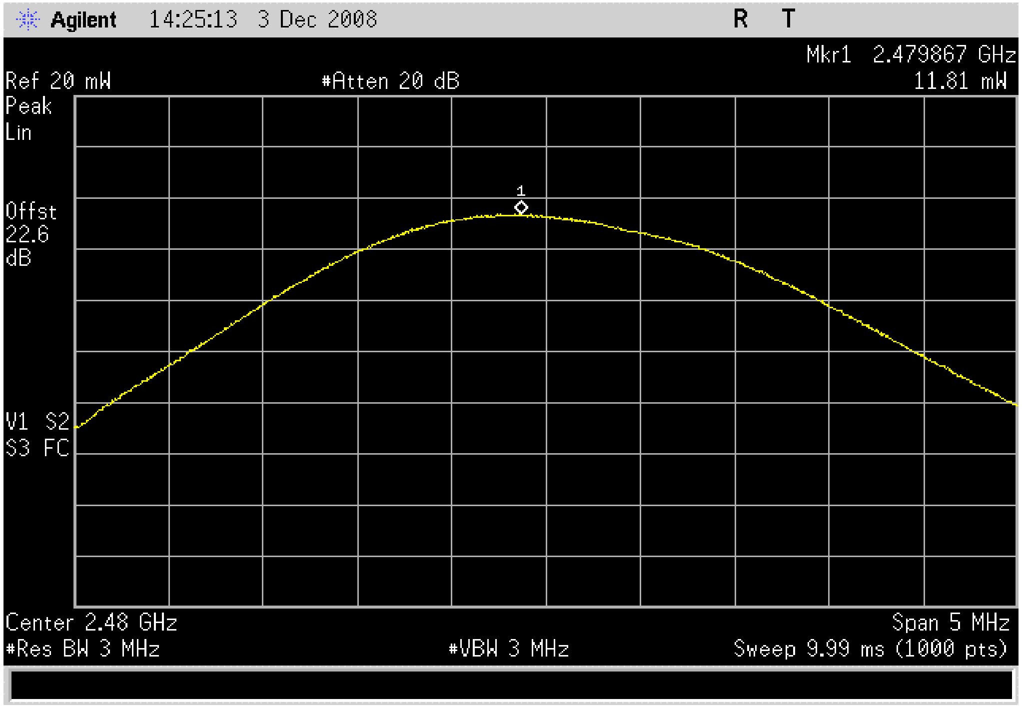


Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Mid Channel					
Result:	Pass	**Value:**	12.27 mW	**Limit:**	1 W



OUTPUT POWER

Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel					
Result:	Pass	**Value:**	11.81 mW	**Limit:**	1 W



BAND EDGE COMPLIANCE

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
Spectrum Analyzer	Agilent	E4407B	AAU	12/7/2007	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	6/27/2008	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The requirements of FCC 15.247(d) for emissions at least 20dB below the carrier in any 100kHz bandwidth outside the allowable band was measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 10 MHz below the band edge to 10 MHz above the band edge.

The EUT was transmitting at its maximum data rate using all three types of modulations available in Bluetooth EDR.

XMit 2007.06.13

BAND EDGE COMPLIANCE

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**			**Work Order:**	**SPTE0105**
Serial Number:	**None**			**Date:**	**12/03/08**
Customer:	**Spectrum Technology, Inc.**			**Temperature:**	**22°C**
Attendees:	**None**			**Humidity:**	**44%**
Project:	**None**			**Barometric Pres.:**	**30.32 in**
Tested by:	**Rod Peloquin**	**Power:**	**120VAC/60Hz**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2008	ANSI C63.4:2003 KDB No. 558074

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

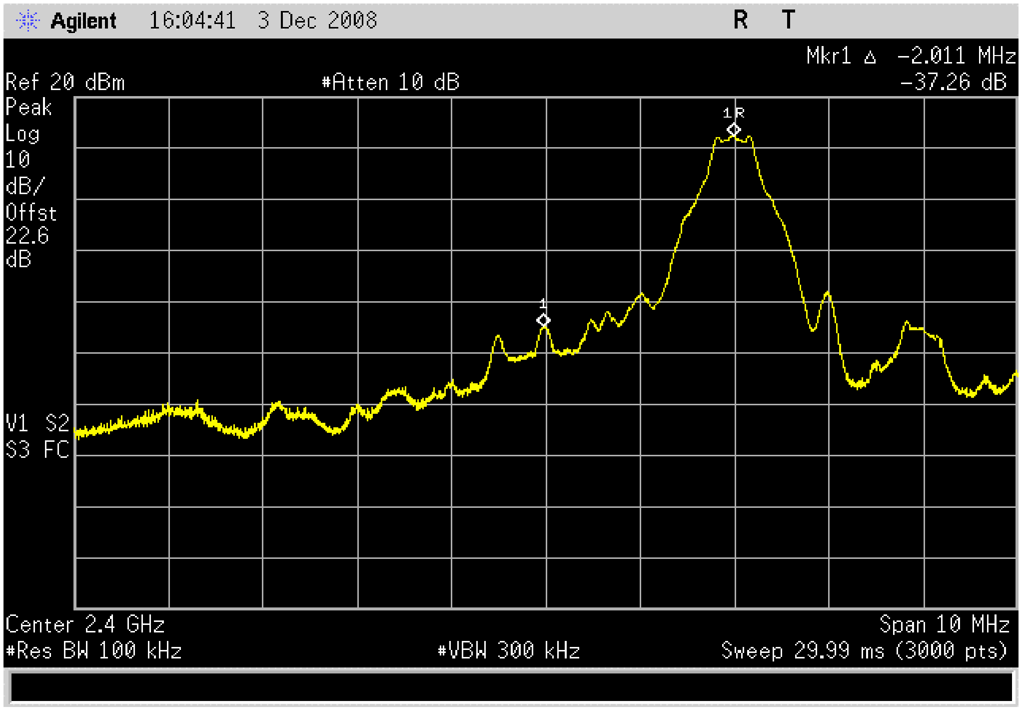
No Deviations

Configuration #	**1**	*Signature*

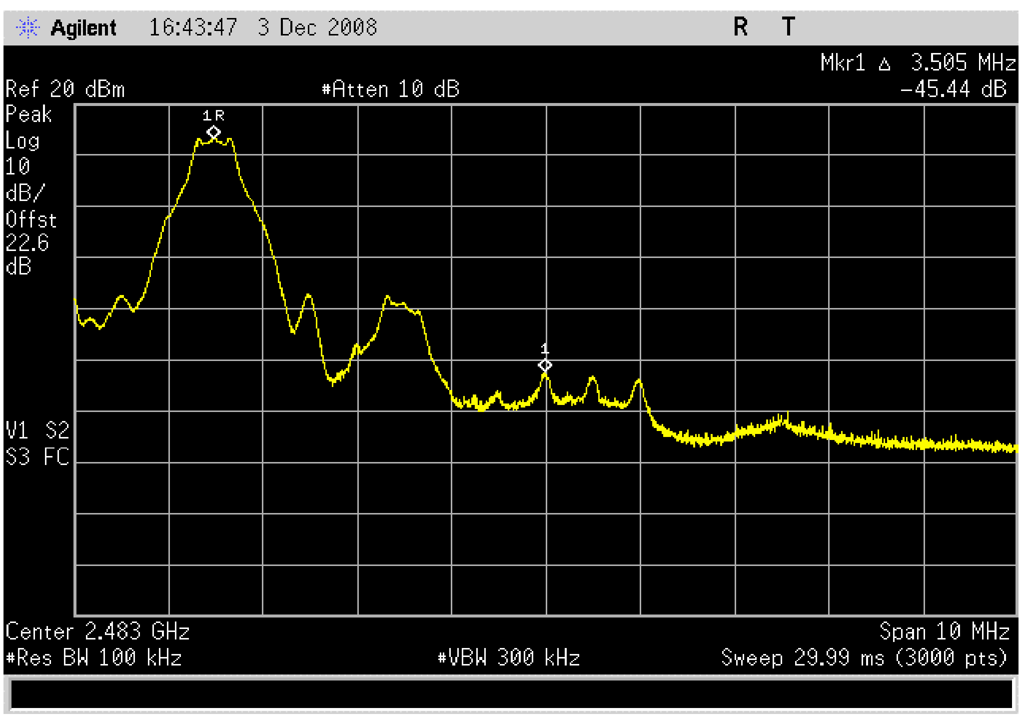
	Value	Limit	Results
Bluetooth, GFSK, DH5, Power (255, 30)			
Low Channel, 2402 MHz	-37.3 dBc	≤ -20 dBc	Pass
High Channel, 2480 MHz	-45.4 dBc	≤ -20 dBc	Pass
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78)			
Low Channel, 2402 MHz	-35.1 dBc	≤ -20 dBc	Pass
High Channel, 2480 MHz	-41.0 dBc	≤ -20 dBc	Pass
Bluetooth, 8-DPSK, 3DH5, Power (227, 78)			
Low Channel, 2402 MHz	-35.5 dBc	≤ -20 dBc	Pass
High Channel, 2480 MHz	-40.9 dBc	≤ -20 dBc	Pass

BAND EDGE COMPLIANCE

Bluetooth, GFSK, DH5, Power (255, 30), Low Channel, 2402 MHz					
Result:	Pass	**Value:**	-37.3 dBc	**Limit:**	≤ -20 dBc

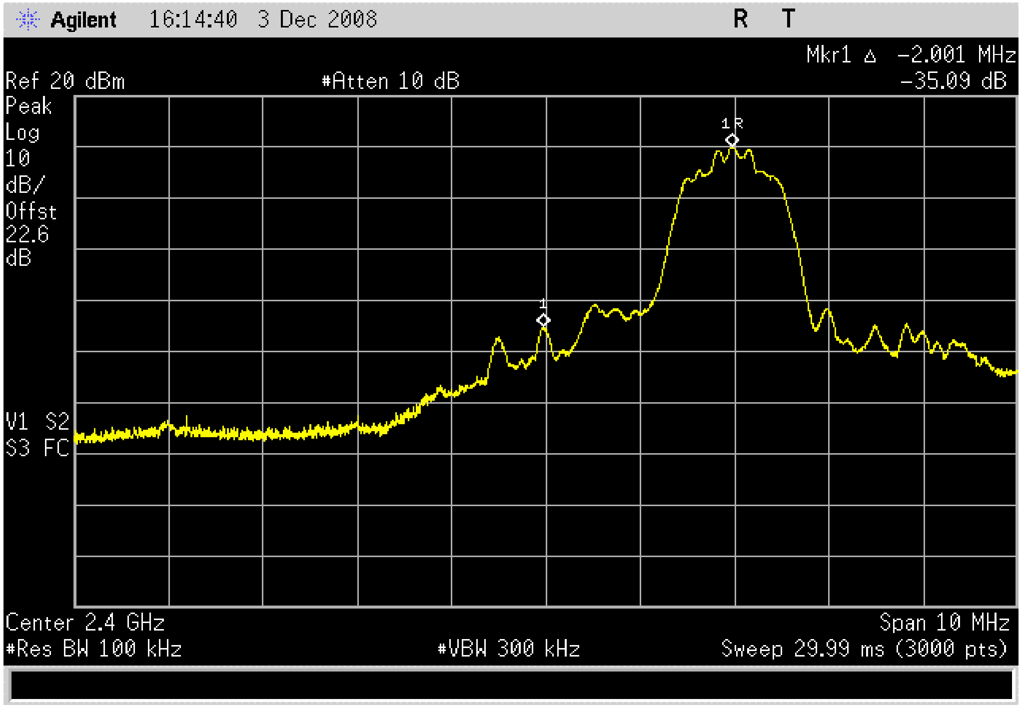


Bluetooth, GFSK, DH5, Power (255, 30), High Channel, 2480 MHz					
Result:	Pass	**Value:**	-45.4 dBc	**Limit:**	≤ -20 dBc

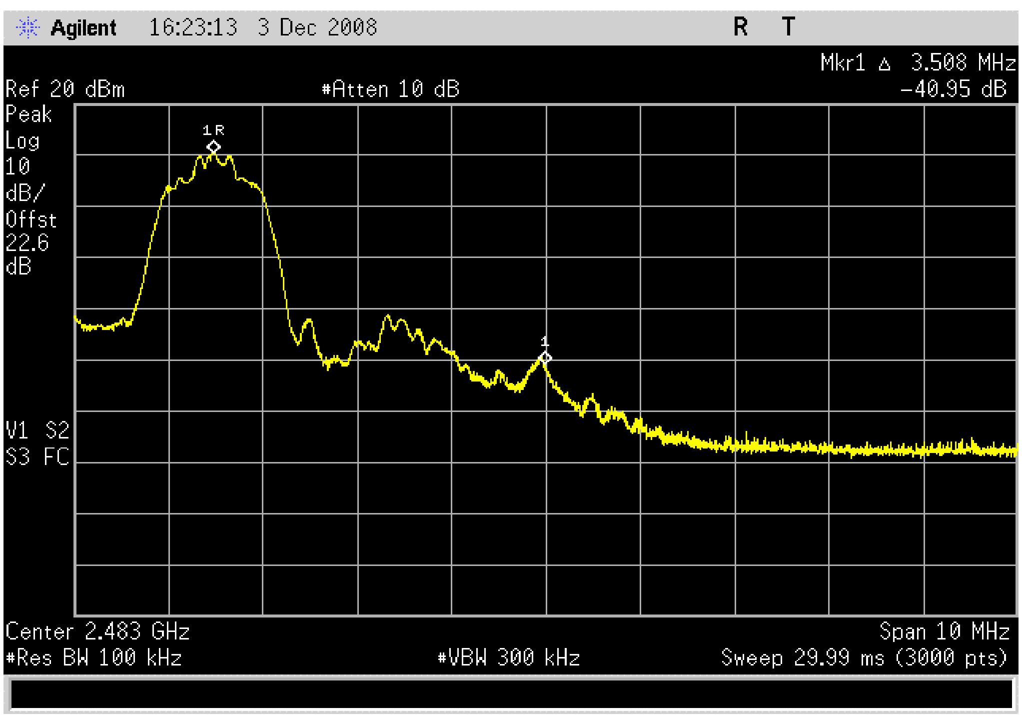


BAND EDGE COMPLIANCE

Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel, 2402 MHz					
Result:	Pass	**Value:**	-35.1 dBc	**Limit:**	≤ -20 dBc

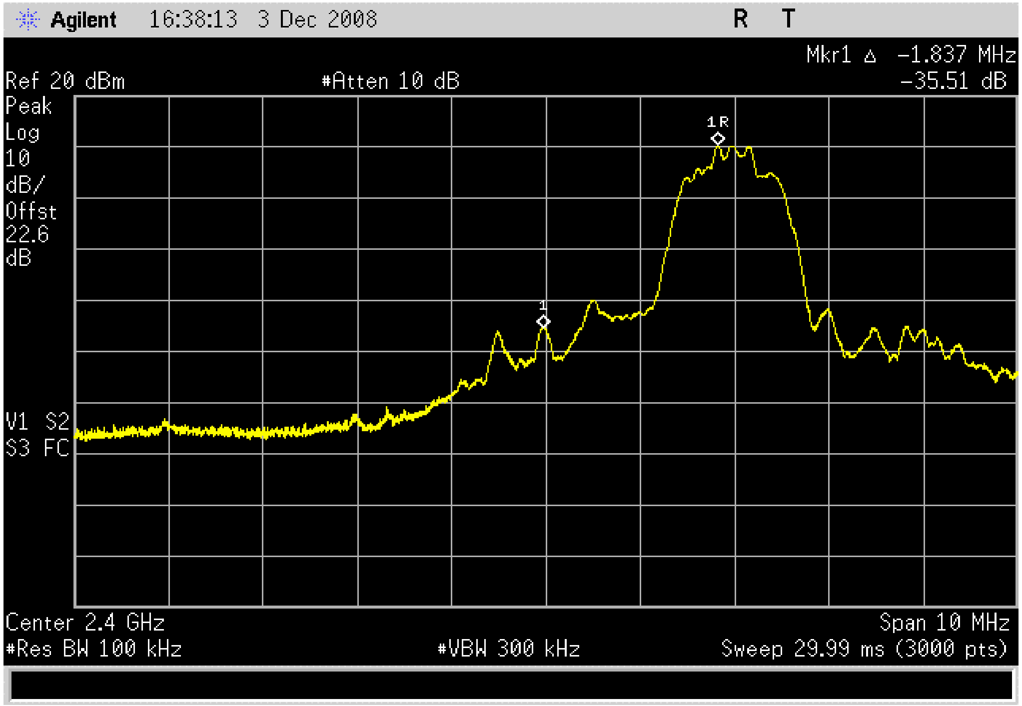


Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel, 2480 MHz					
Result:	Pass	**Value:**	-41.0 dBc	**Limit:**	≤ -20 dBc

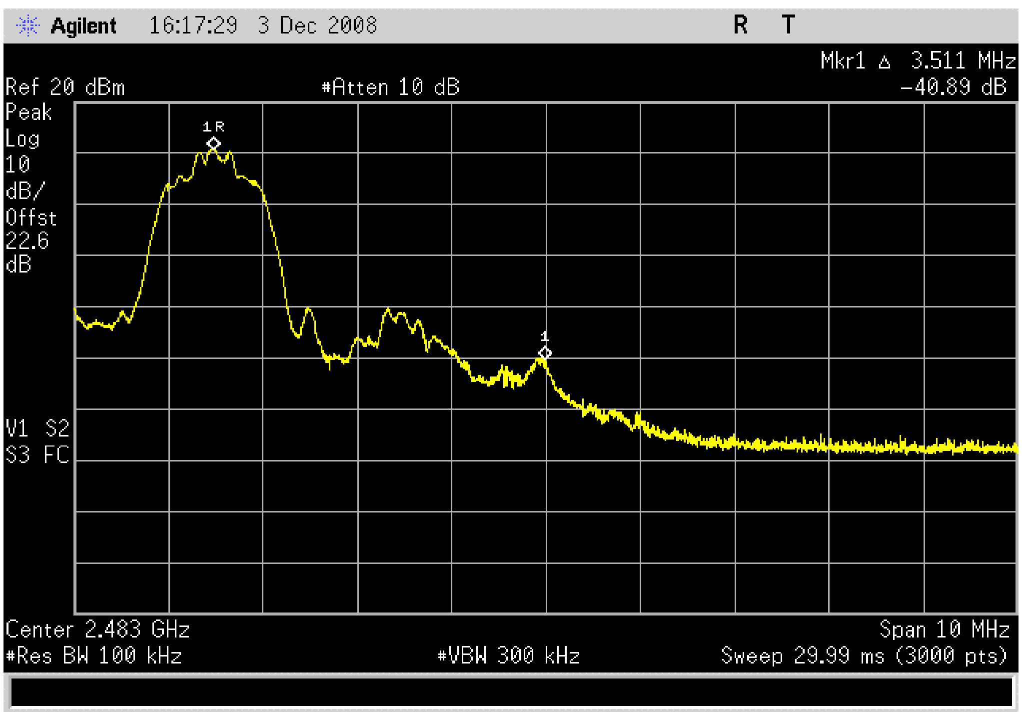


BAND EDGE COMPLIANCE

Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel, 2402 MHz					
Result:	Pass	**Value:**	-35.5 dBc	**Limit:**	≤ -20 dBc



Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel, 2480 MHz					
Result:	Pass	**Value:**	-40.9 dBc	**Limit:**	≤ -20 dBc



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
Spectrum Analyzer	Agilent	E4407B	AAU	12/7/2007	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	6/27/2008	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency.

NORTHWEST
EMC

SPURIOUS CONDUCTED EMISSIONS

XMit 2007.06.13

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**	**Work Order:**	**SPTE0105**
Serial Number:	**None**	**Date:**	**12/04/08**
Customer:	**Spectrum Technology, Inc.**	**Temperature:**	**22°C**
Attendees:	**None**	**Humidity:**	**44%**
Project:	**None**	**Barometric Pres.:**	**30.32 in**
Tested by:	**Rod Peloquin** Power: **120VAC/60Hz**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2008	ANSI C63.4:2003 KDB No. 558074

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

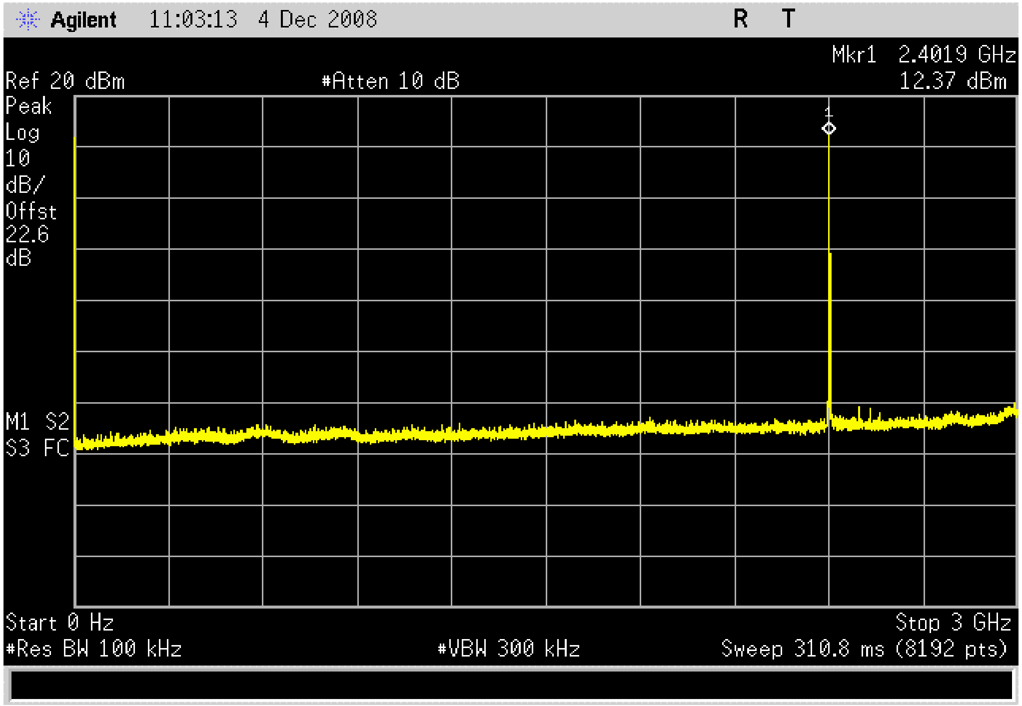
No Deviations

Configuration #	**1**	*Signature*

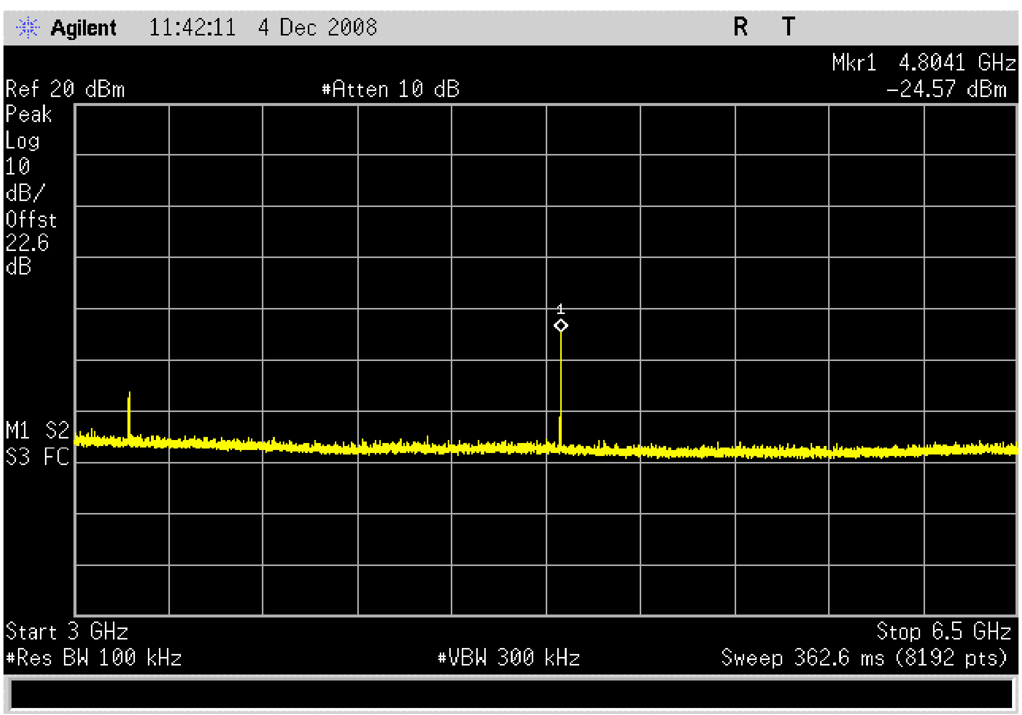
			Value	**Limit**	**Results**
Bluetooth, GFSK, DH5, Power (255, 30)					
	Low Channel, 2402MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	-36.9 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
	Mid Channel, 2441 MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	-40.9 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
	High Channel, 2480 MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	-42.6 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78)					
	Low Channel, 2402MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	< -40 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< 40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
	Mid Channel, 2441 MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	< -40 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
	High Channel, 2480 MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	< -40 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
Bluetooth, 8-DPSK, 3DH5, Power (227, 78)					
	Low Channel, 2402MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	< -40 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
	Mid Channel, 2441 MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	< -40 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
	High Channel, 2480 MHz				
		0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
		3 - 6.5 GHz	< -40 dBc	≤ -20 dBc	Pass
		6.5 - 12.8 GHz	< -40 dBc	≤ -20 dBc	Pass
		12.8 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass

SPURIOUS CONDUCTED EMISSIONS

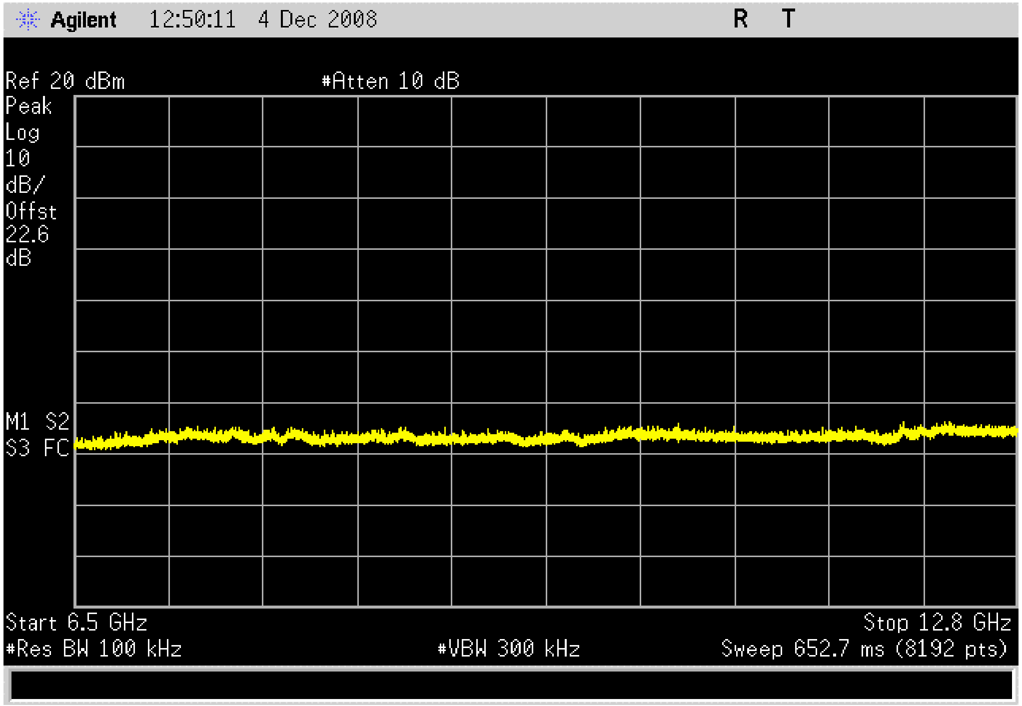
Bluetooth, GFSK, DH5, Power (255, 30), Low Channel, 2402MHz, 0 - 3 GHz		
Result: Pass	**Value:** < -40 dBc	**Limit:** ≤ -20 dBc



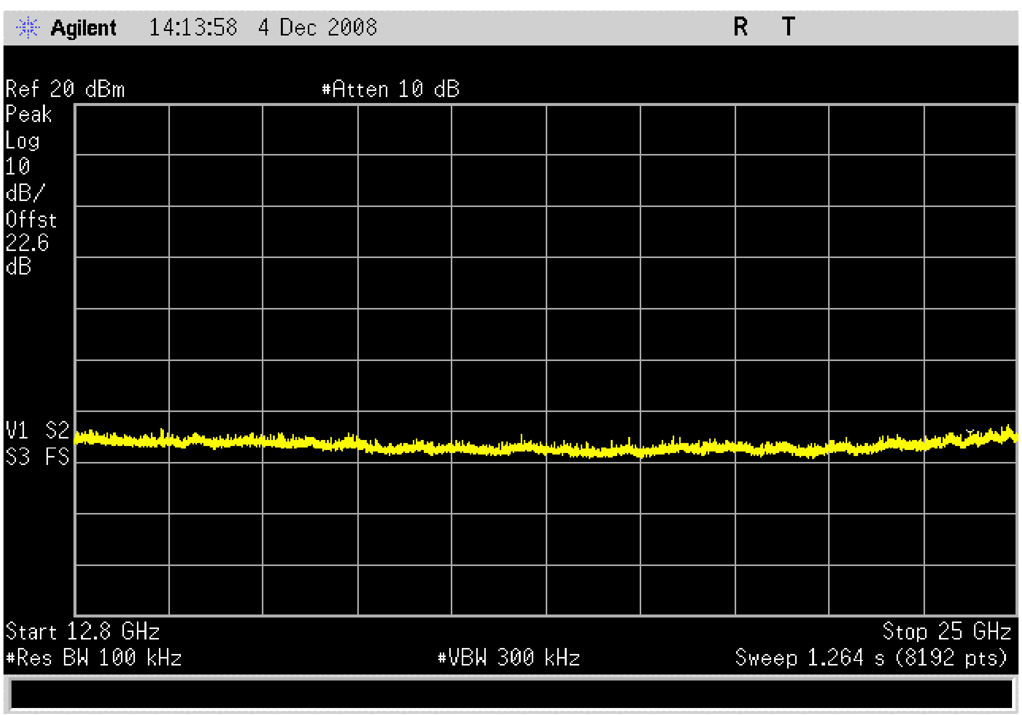
Bluetooth, GFSK, DH5, Power (255, 30), Low Channel, 2402MHz, 3 - 6.5 GHz		
Result: Pass	**Value:** -36.9 dBc	**Limit:** ≤ -20 dBc



Bluetooth, GFSK, DH5, Power (255, 30), Low Channel, 2402MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

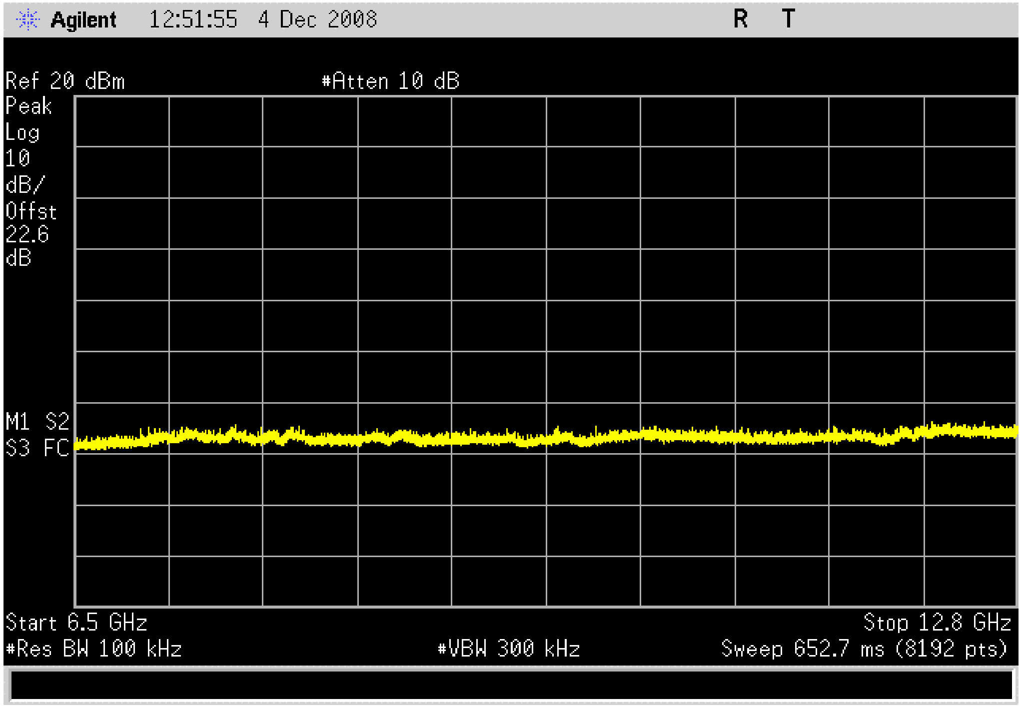


Bluetooth, GFSK, DH5, Power (255, 30), Low Channel, 2402MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

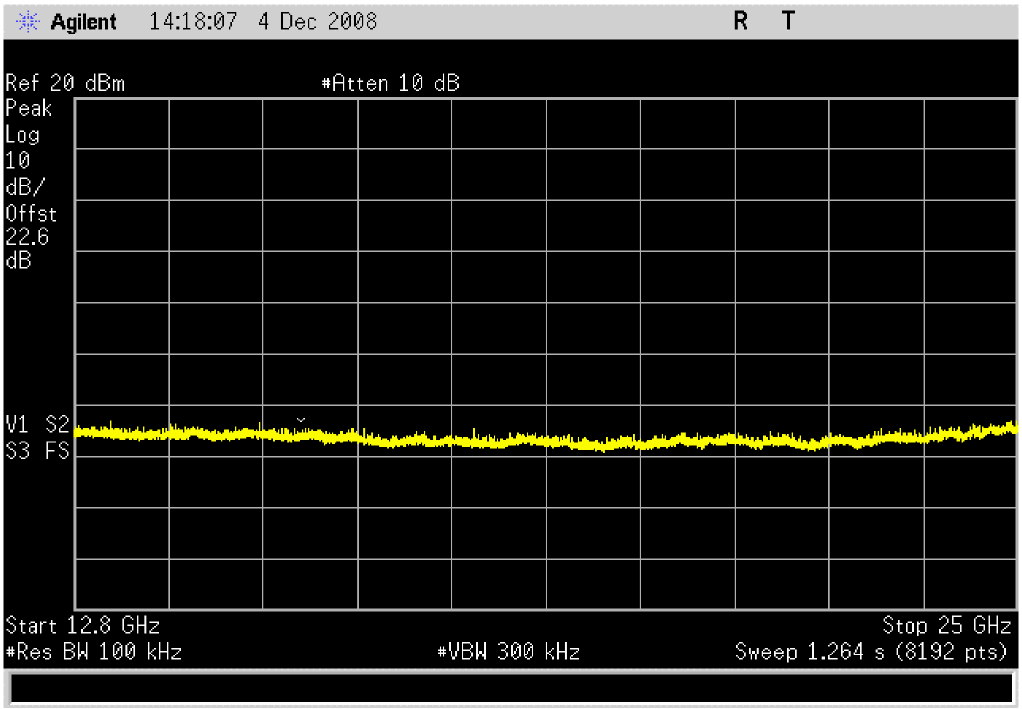


SPURIOUS CONDUCTED EMISSIONS

Bluetooth, GFSK, DH5, Power (255, 30), Mid Channel, 2441 MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

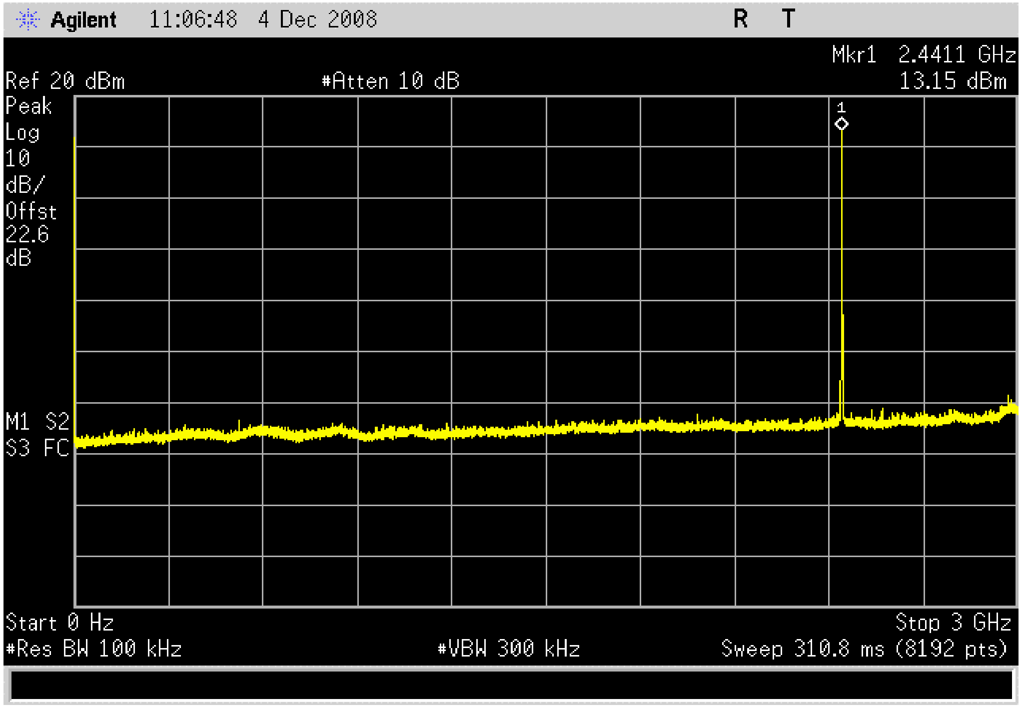


Bluetooth, GFSK, DH5, Power (255, 30), Mid Channel, 2441 MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

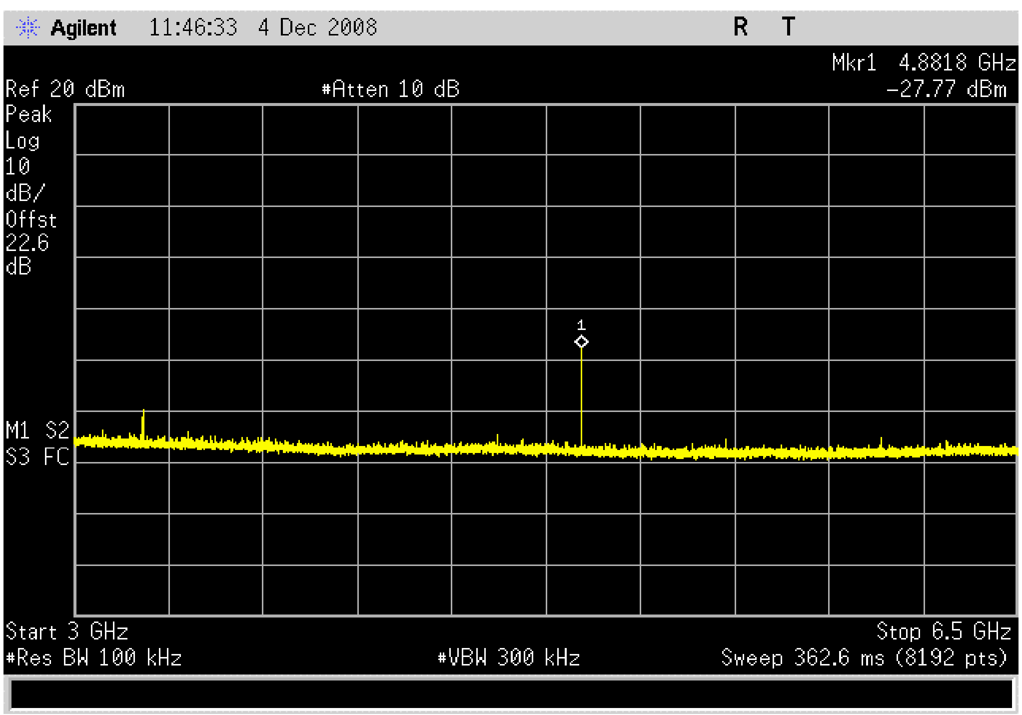


SPURIOUS CONDUCTED EMISSIONS

Bluetooth, GFSK, DH5, Power (255, 30), Mid Channel, 2441 MHz, 0 - 3 GHz		
Result: Pass	**Value:** < -40 dBc	**Limit:** ≤ -20 dBc

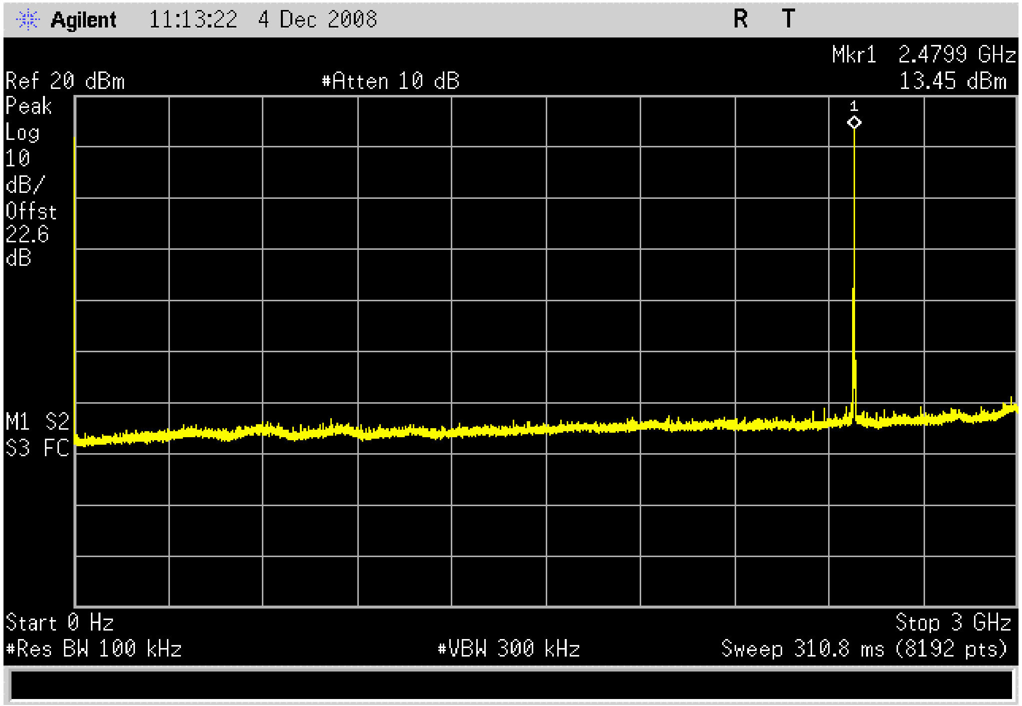


Bluetooth, GFSK, DH5, Power (255, 30), Mid Channel, 2441 MHz, 3 - 6.5 GHz		
Result: Pass	**Value:** -40.9 dBc	**Limit:** ≤ -20 dBc

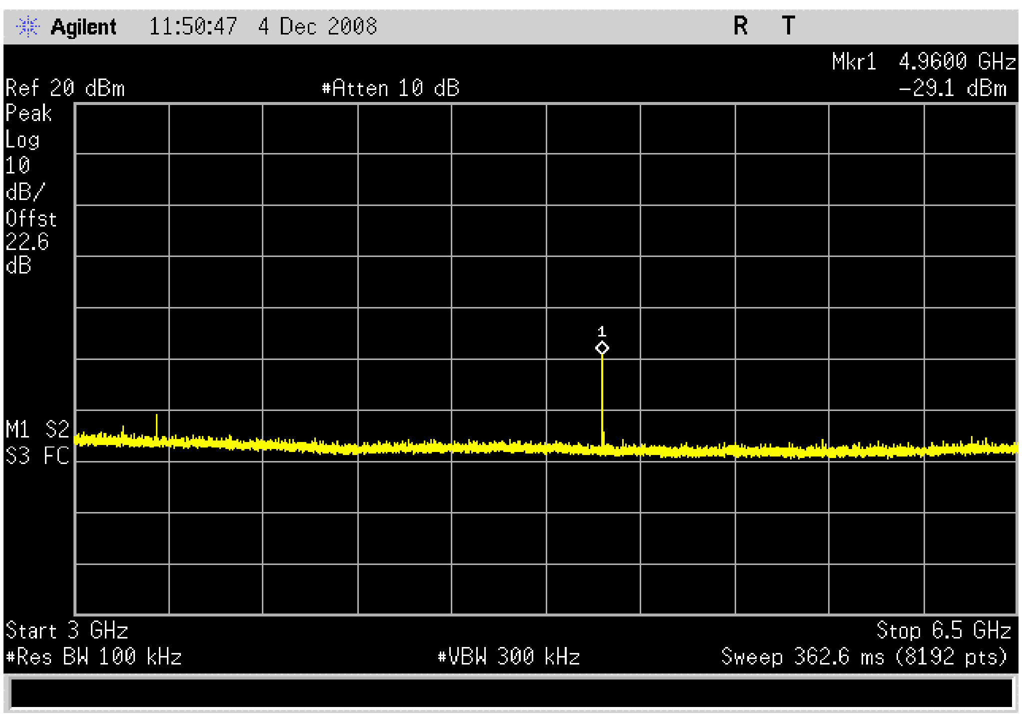


SPURIOUS CONDUCTED EMISSIONS

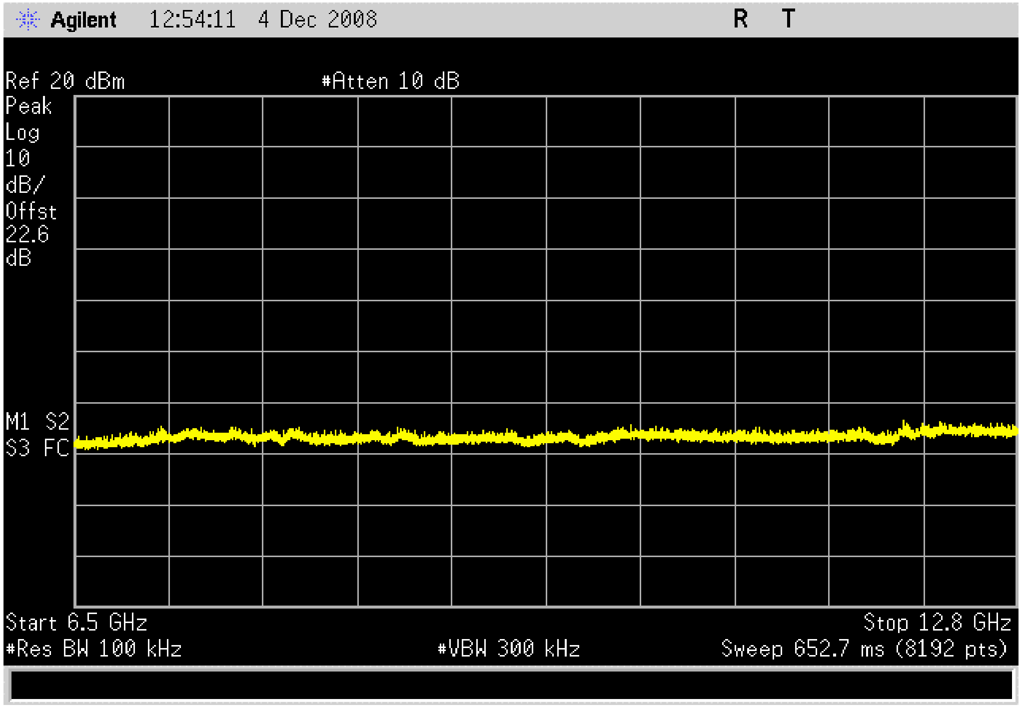
Bluetooth, GFSK, DH5, Power (255, 30), High Channel, 2480 MHz, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



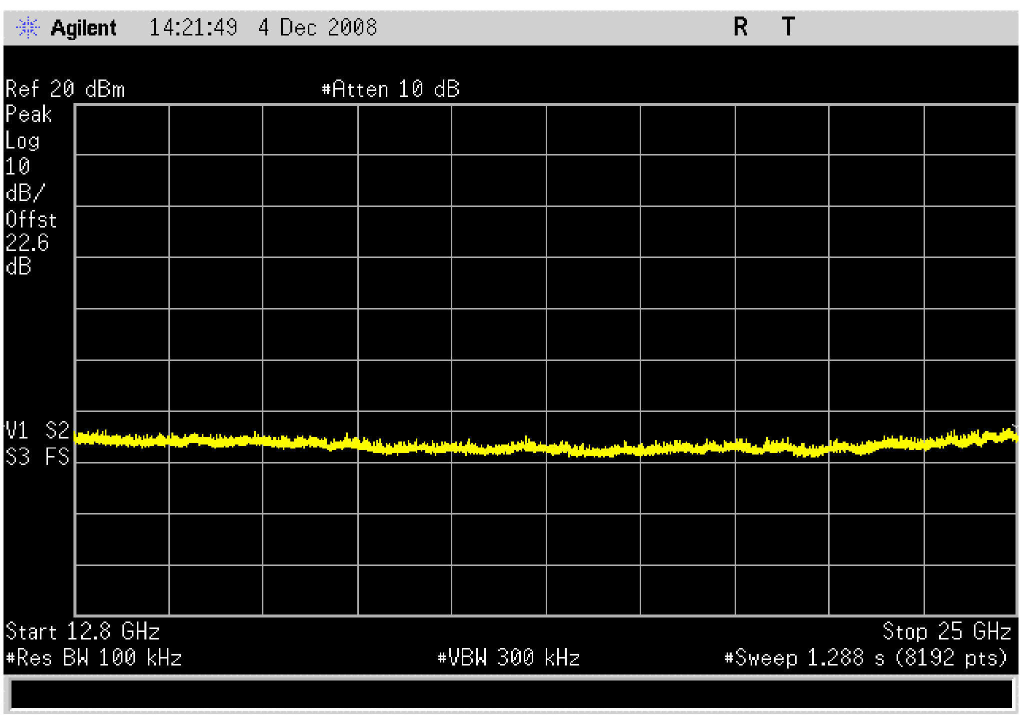
Bluetooth, GFSK, DH5, Power (255, 30), High Channel, 2480 MHz, 3 - 6.5 GHz					
Result:	Pass	**Value:**	-42.6 dBc	**Limit:**	≤ -20 dBc



Bluetooth, GFSK, DH5, Power (255, 30), High Channel, 2480 MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

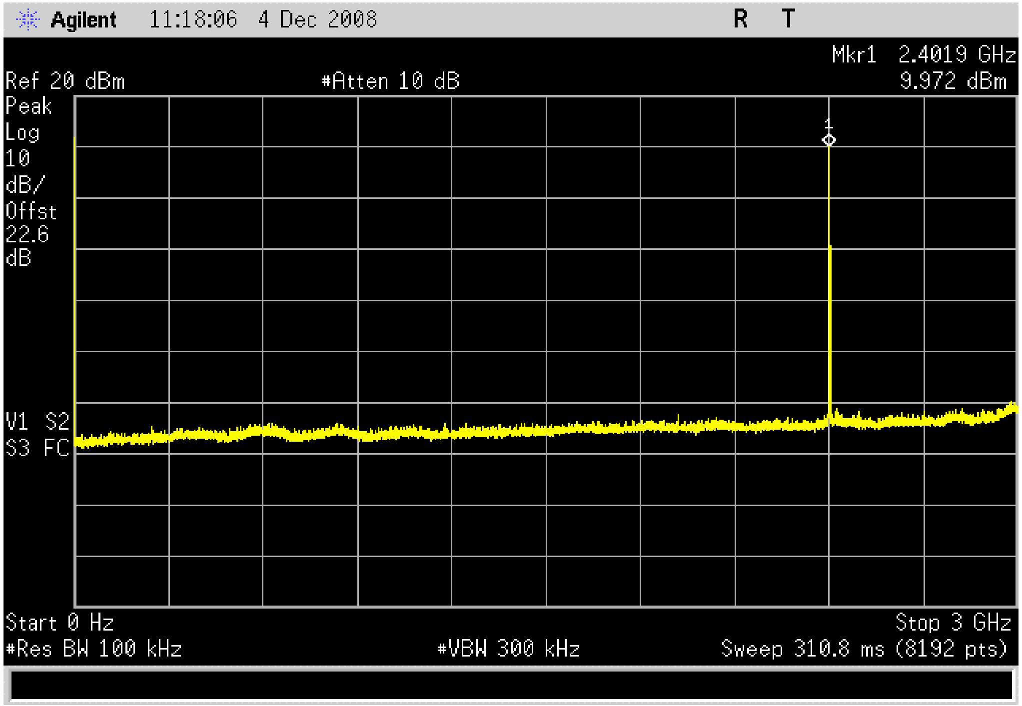


Bluetooth, GFSK, DH5, Power (255, 30), High Channel, 2480 MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

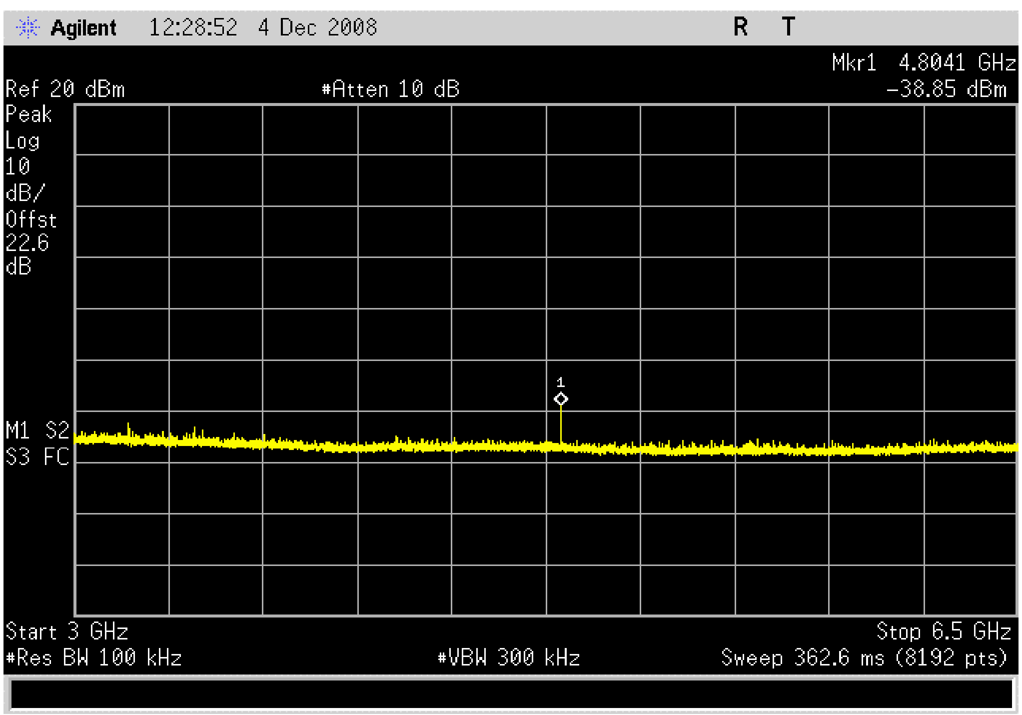


SPURIOUS CONDUCTED EMISSIONS

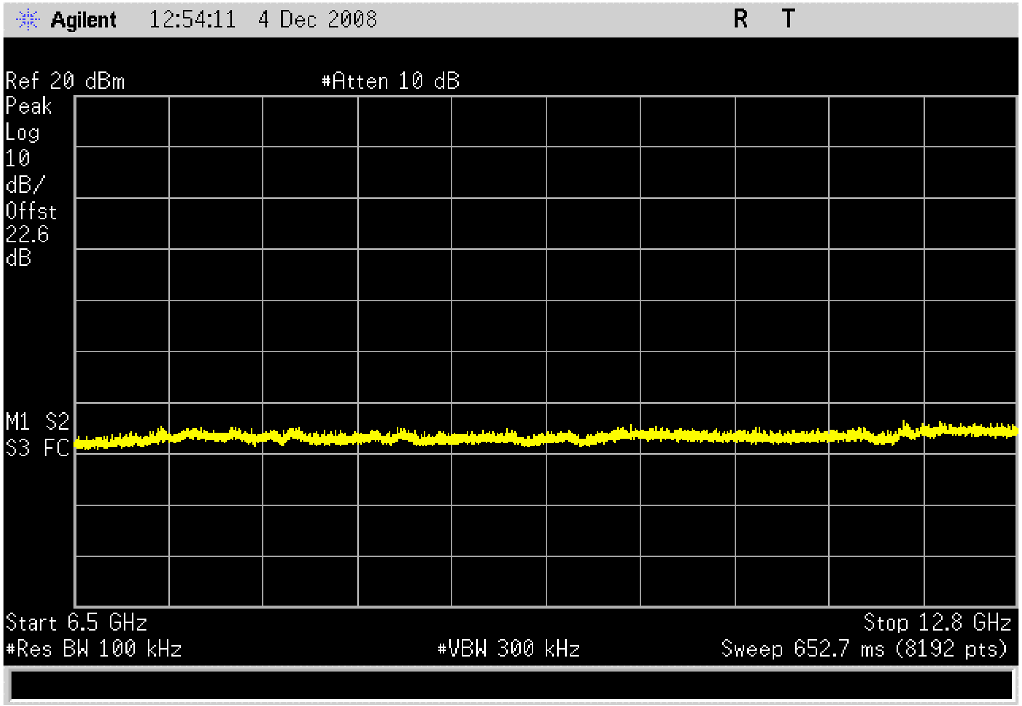
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel, 2402MHz, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



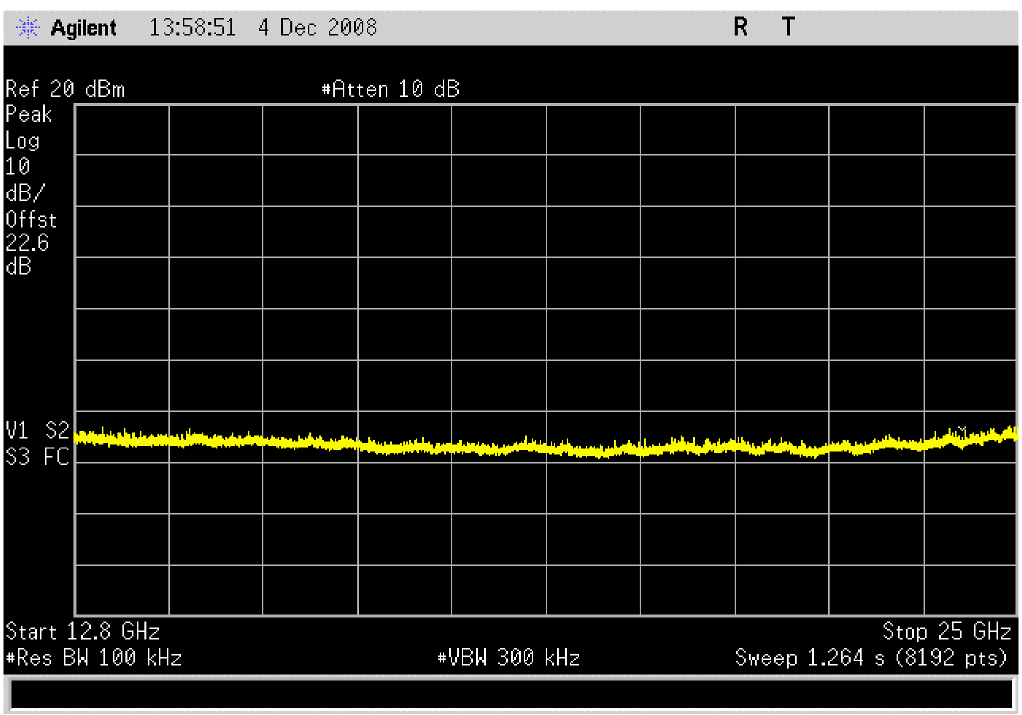
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel, 2402MHz, 3 - 6.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



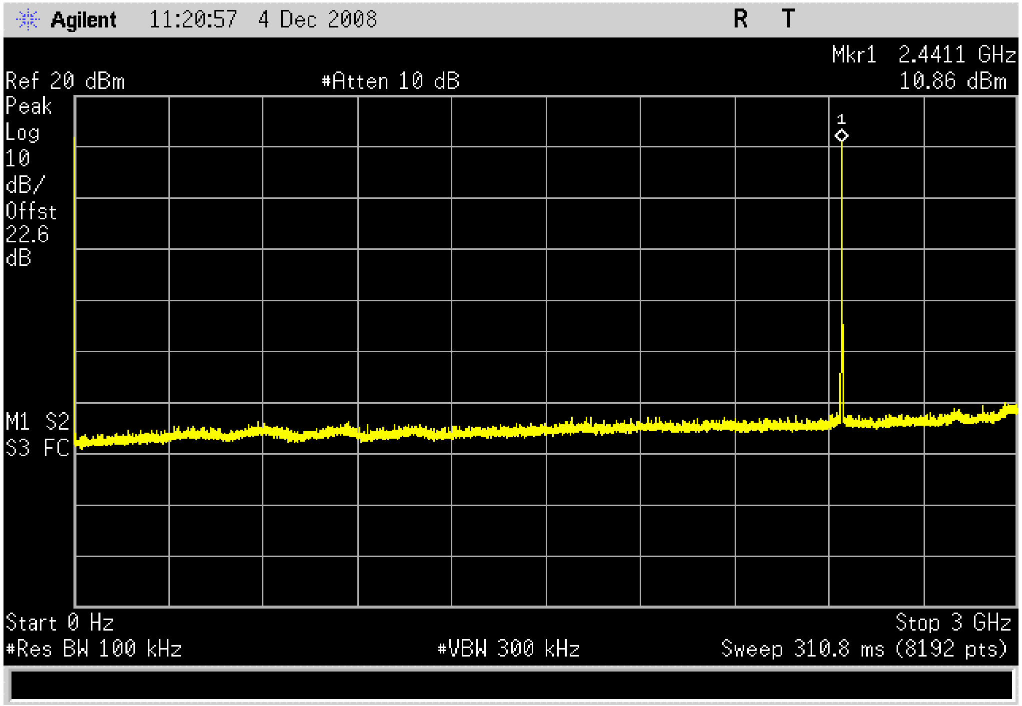
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel, 2402MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< 40 dBc	**Limit:**	≤ -20 dBc



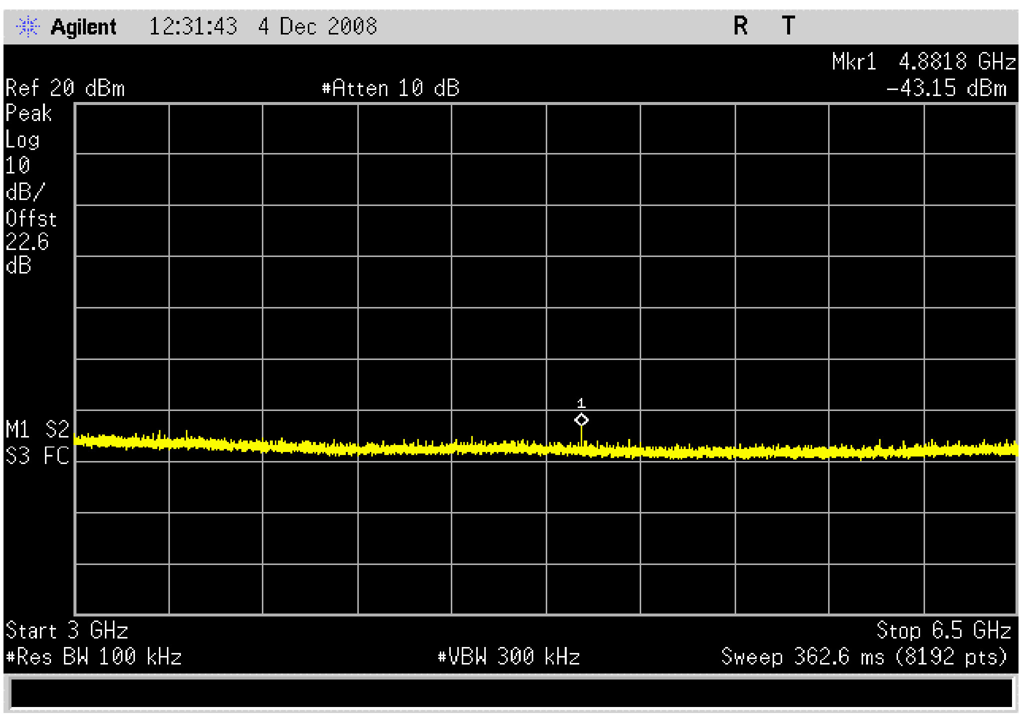
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel, 2402MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



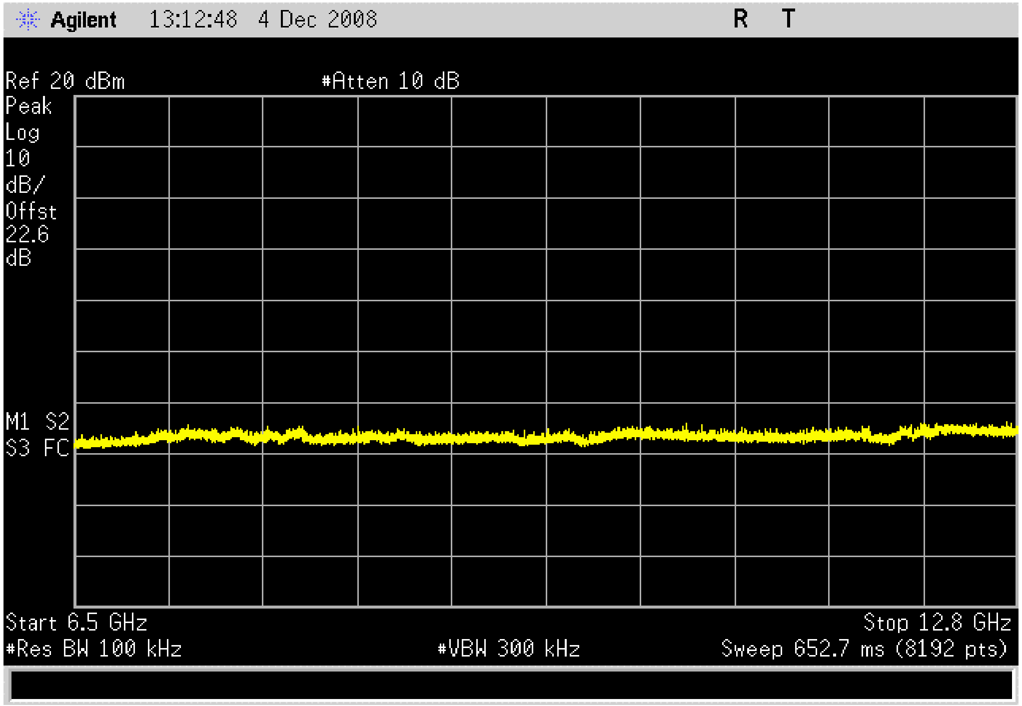
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Mid Channel, 2441 MHz, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



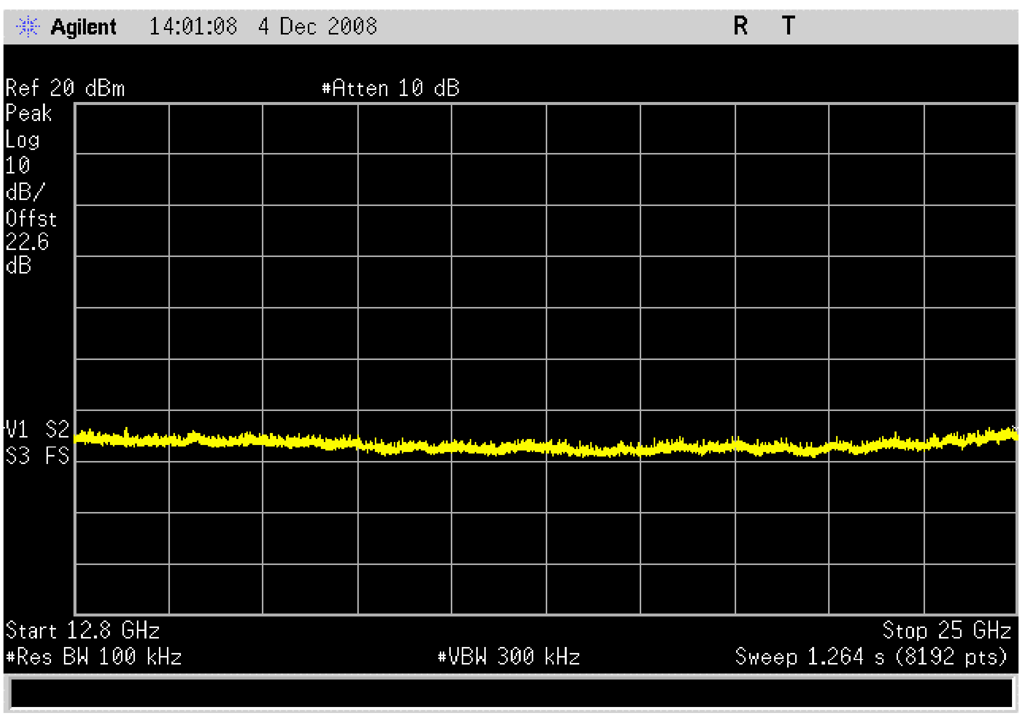
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Mid Channel, 2441 MHz, 3 - 6.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Mid Channel, 2441 MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

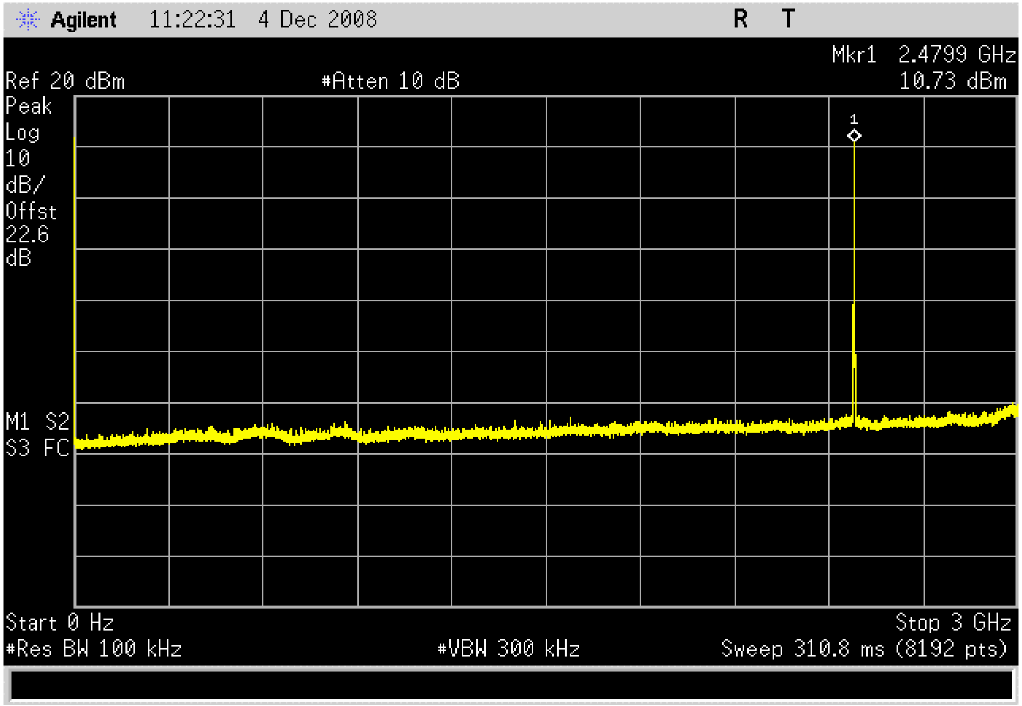


Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Mid Channel, 2441 MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

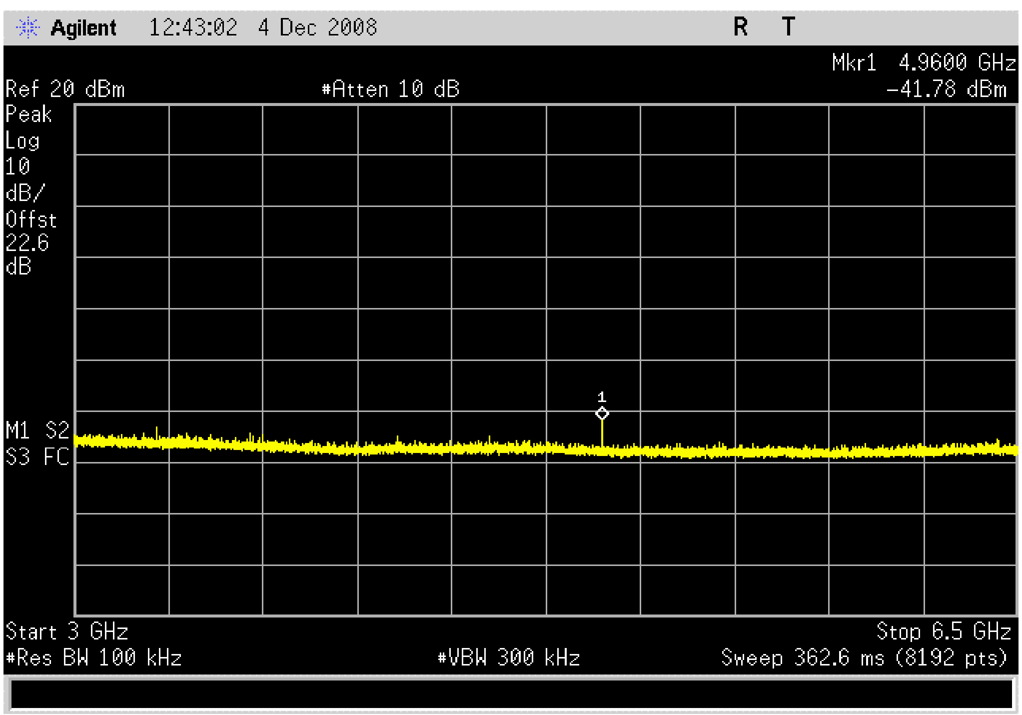


SPURIOUS CONDUCTED EMISSIONS

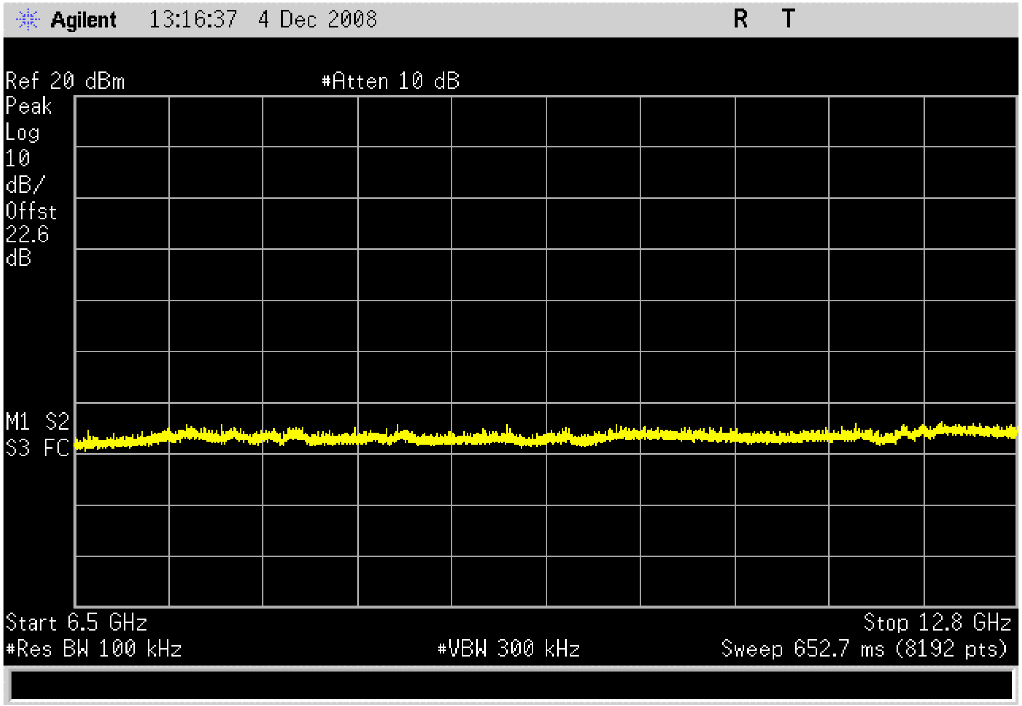
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel, 2480 MHz, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



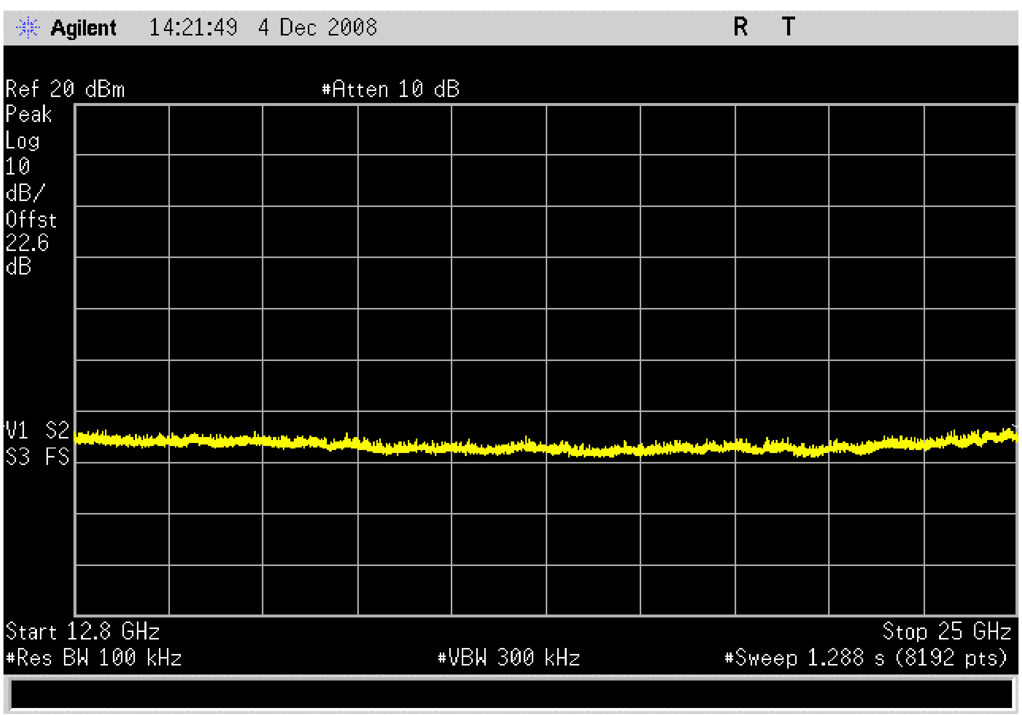
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel, 2480 MHz, 3 - 6.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel, 2480 MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

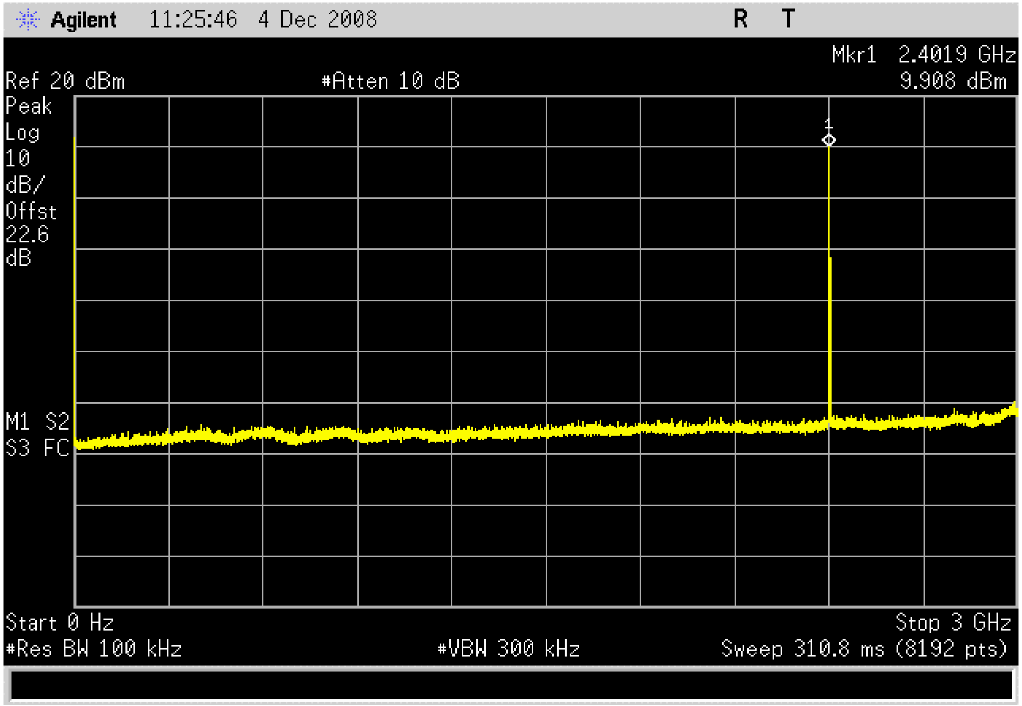


Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel, 2480 MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

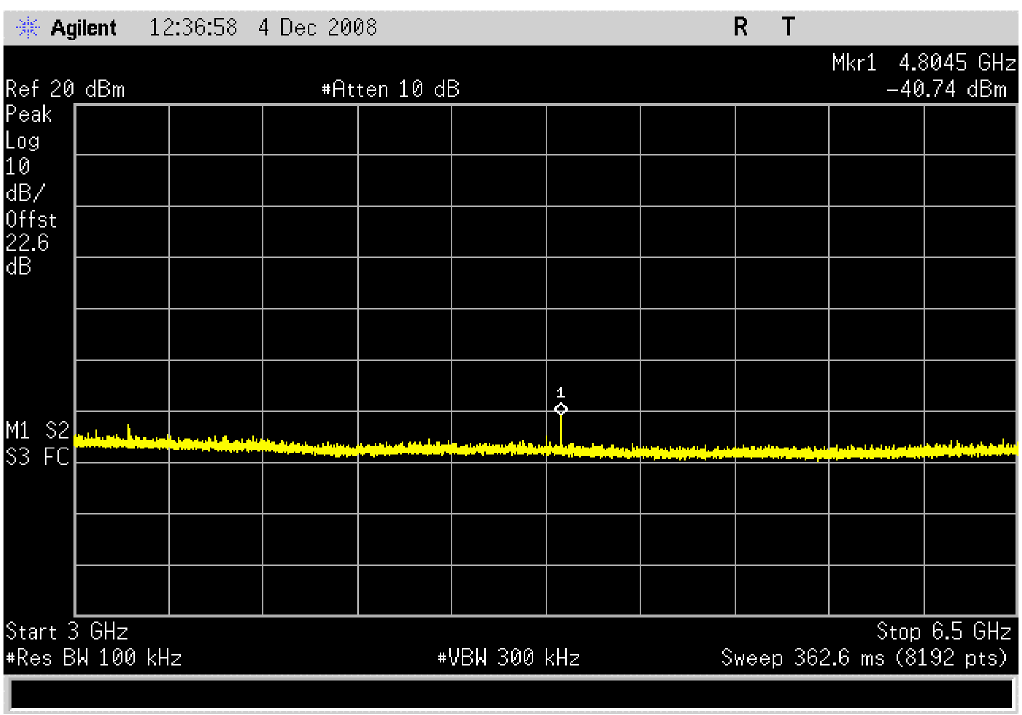


SPURIOUS CONDUCTED EMISSIONS

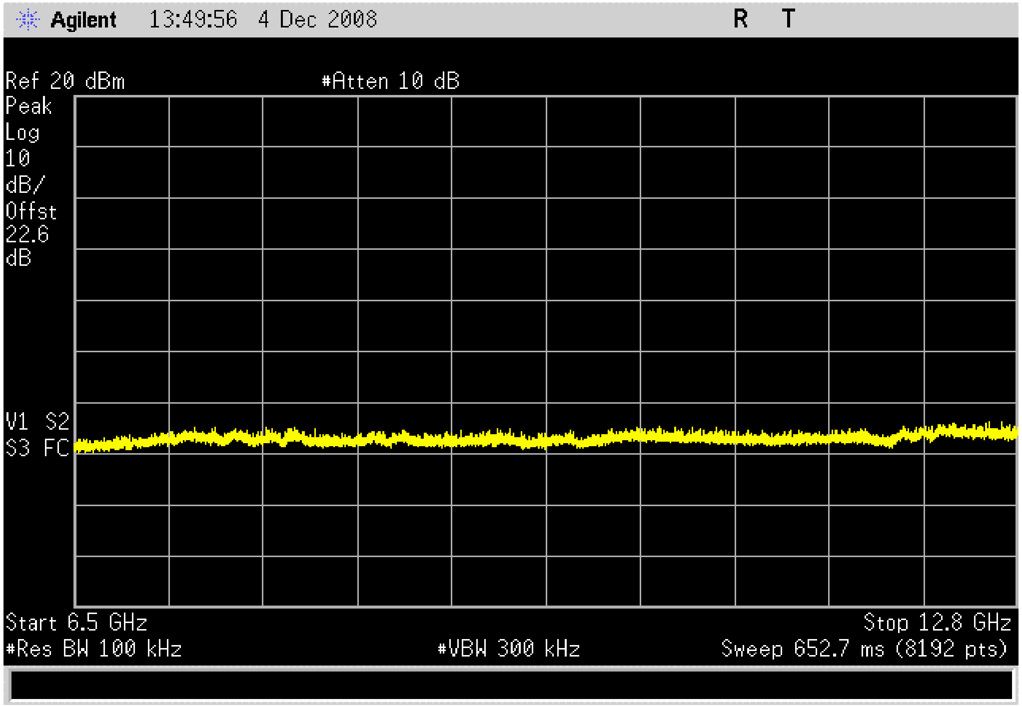
Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel, 2402MHz, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



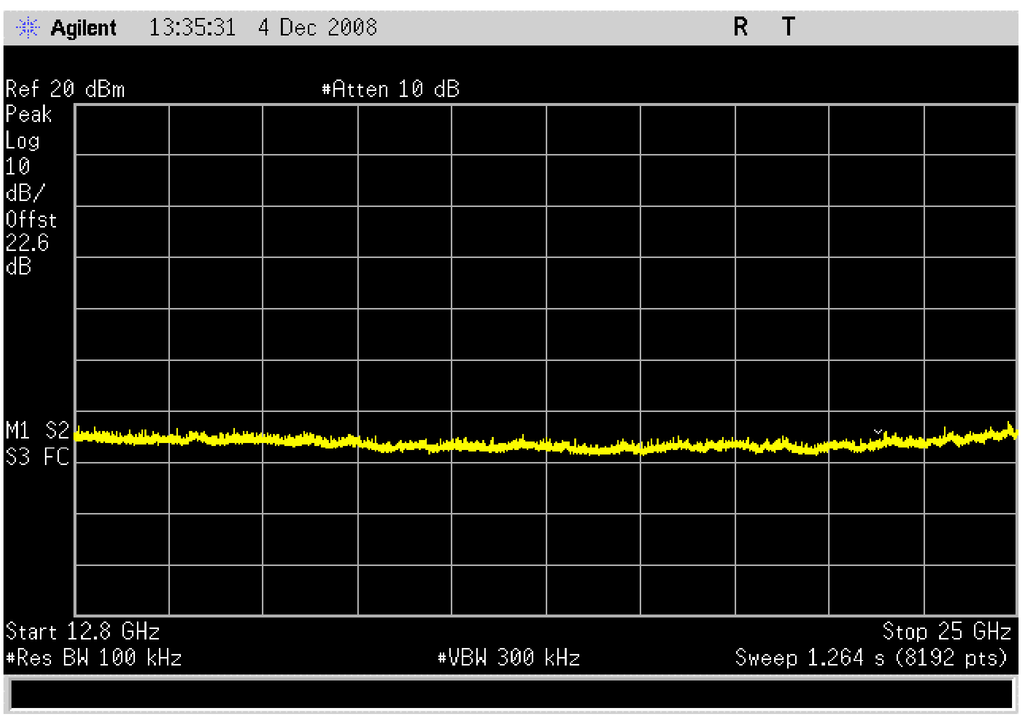
Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel, 2402MHz, 3 - 6.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



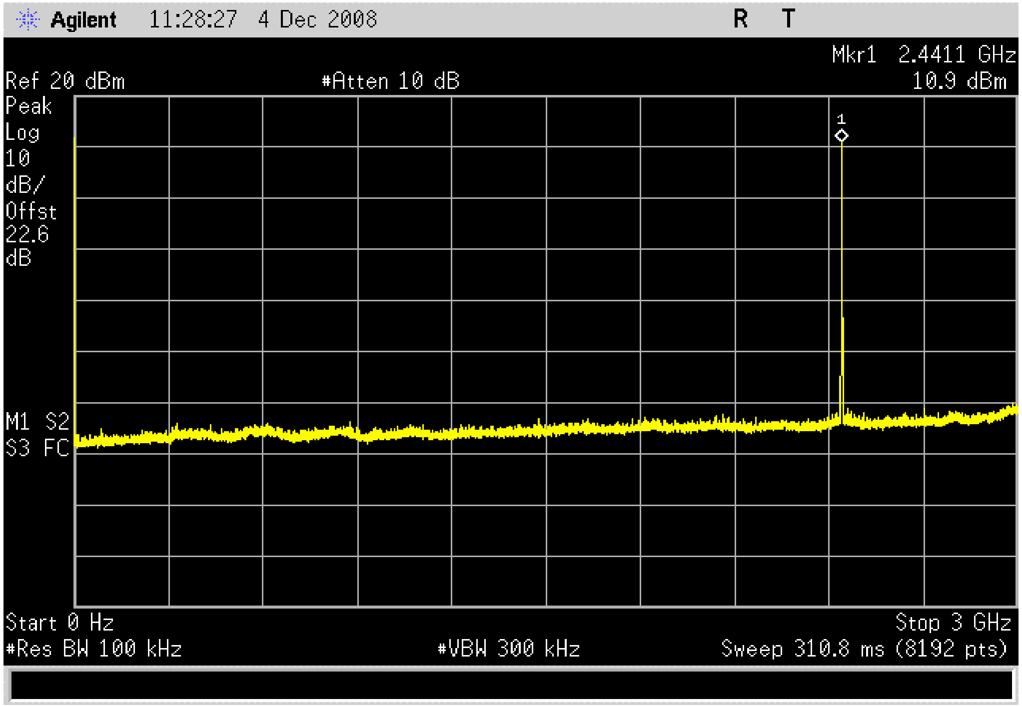
Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel, 2402MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



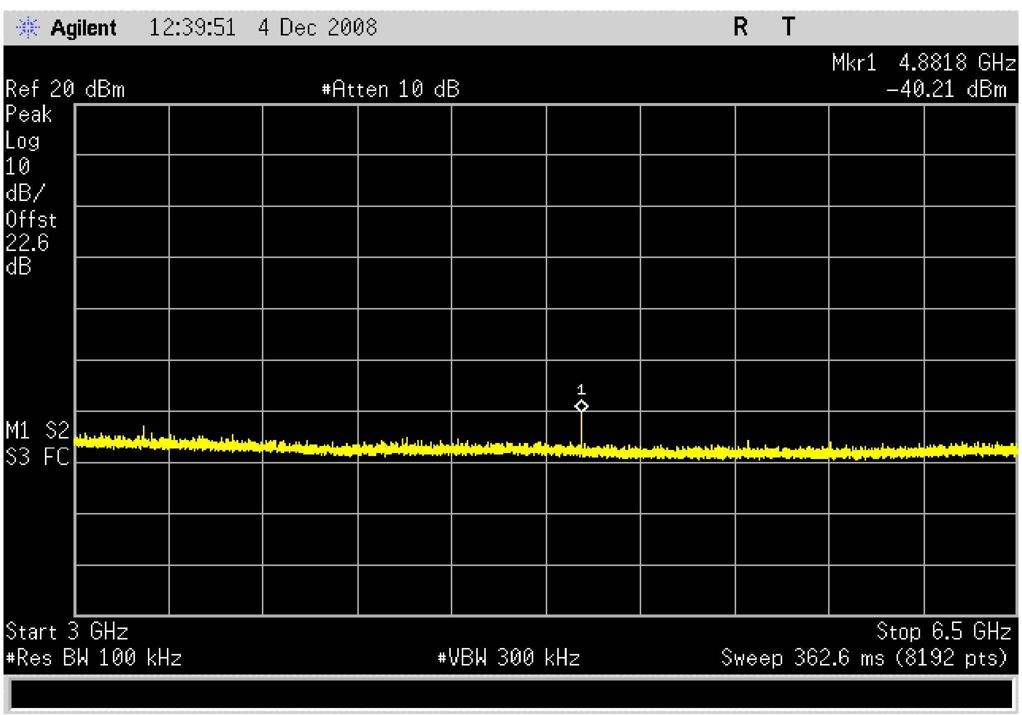
Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel, 2402MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Mid Channel, 2441 MHz, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

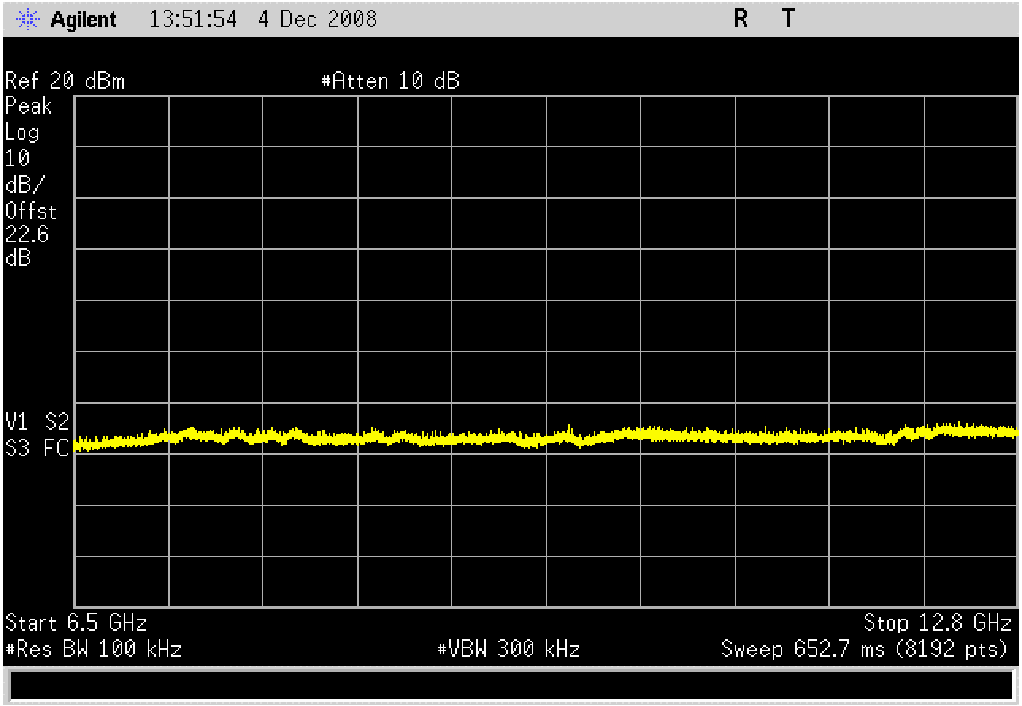


Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Mid Channel, 2441 MHz, 3 - 6.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

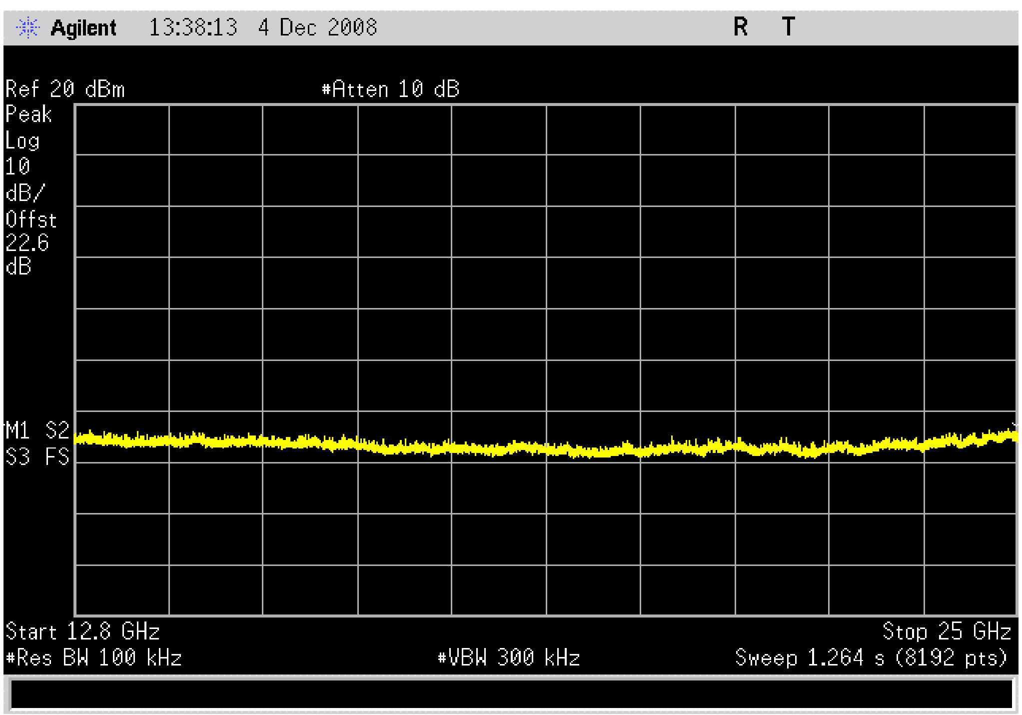


SPURIOUS CONDUCTED EMISSIONS

Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Mid Channel, 2441 MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

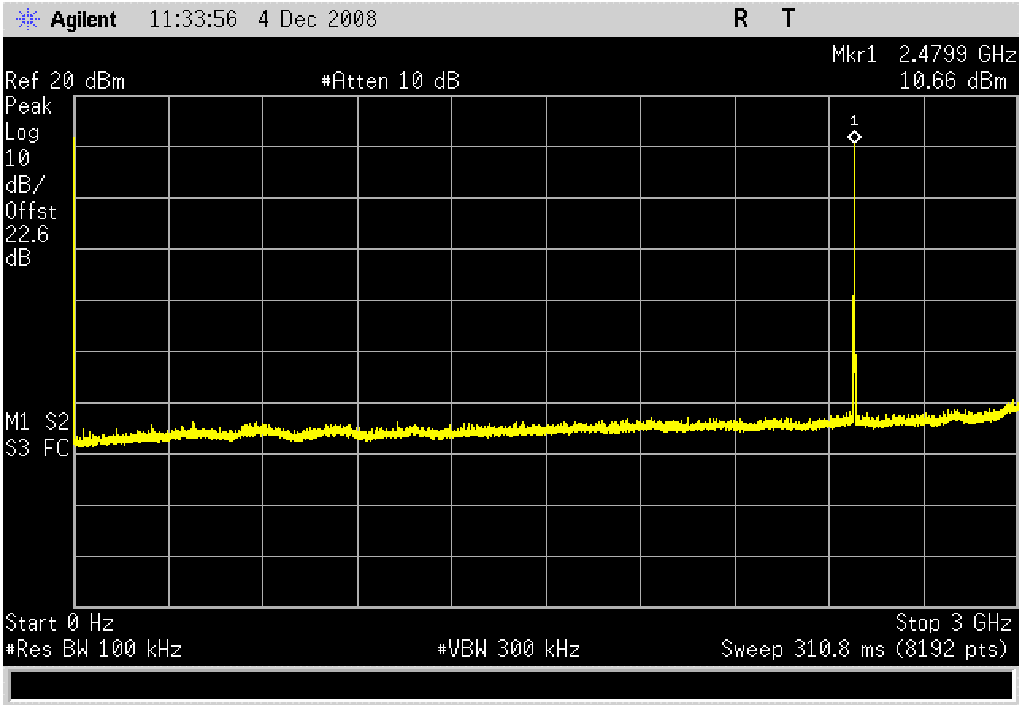


Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Mid Channel, 2441 MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

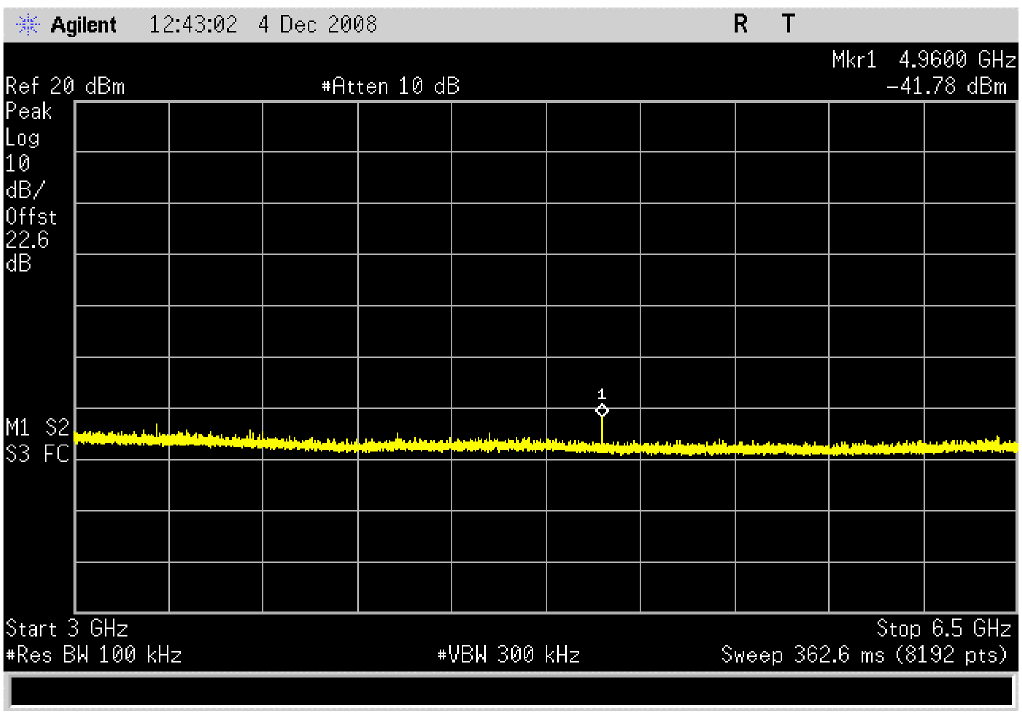


SPURIOUS CONDUCTED EMISSIONS

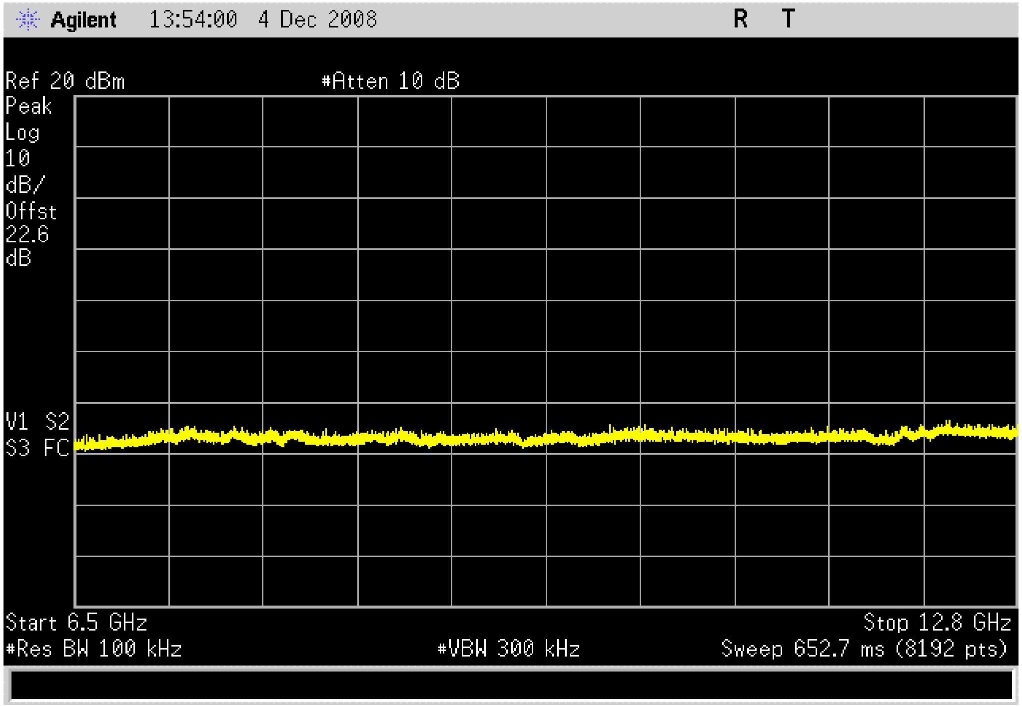
Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel, 2480 MHz, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



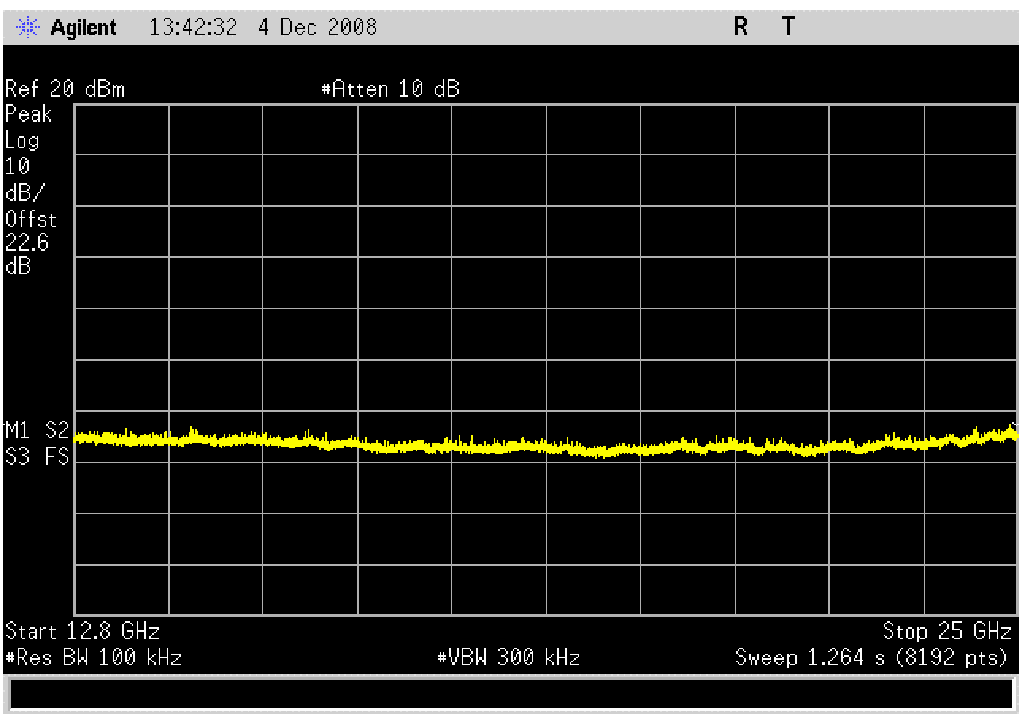
Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel, 2480 MHz, 3 - 6.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel, 2480 MHz, 6.5 - 12.8 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel, 2480 MHz, 12.8 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



POWER SPECTRAL DENSITY

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
Spectrum Analyzer	Agilent	E4407B	AAU	12/7/2007	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	6/27/2008	13
Power Meter	Gigatronics	8651A	SPM	12/7/2007	13
Power Sensor	Gigatronics	80701A	SPL	12/7/2007	13
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2007	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The peak power spectral density measurements were measured with the EUT set to low, mid, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate for each modulation type available. Per the procedure outlined in FCC KDB 558074, March 23, 2005, the spectrum analyzer was used as follows:

> The emission peak(s) were located and zoom in on within the passband. The resolution bandwidth was set to 3 kHz, the video bandwidth was set to greater than or equal to the resolution bandwidth. The sweep speed was set equal to the span divided by 3 kHz (sweep = (SPAN/3 kHz)). For example, given a span of 1.5 MHz, the sweep should be 1.5 x $10^6 \div 3 \times 10^3$ = 500 seconds. External attenuation was used and added to the reading. The following FCC procedure was used for modifying the power spectral density measurements:

“If the spectrum line spacing cannot be resolved on the available spectrum analyzer, the noise density function on most modern conventional spectrum analyzers will directly measure the noise power density normalized to a 1 Hz noise power bandwidth. Add 34.8 dB for correction to 3 kHz.”

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XMit 2007.06.13

POWER SPECTRAL DENSITY

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**			**Work Order:**	**SPTE0105**
Serial Number:	**None**			**Date:**	**12/04/08**
Customer:	**Spectrum Technology, Inc.**			**Temperature:**	**22°C**
Attendees:	**None**			**Humidity:**	**44%**
Project:	**None**			**Barometric Pres.:**	**30.32 in**
Tested by:	**Rod Peloquin**	**Power:**	**120VAC/60Hz**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2008	ANSI C63.4:2003 KDB No. 558074

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

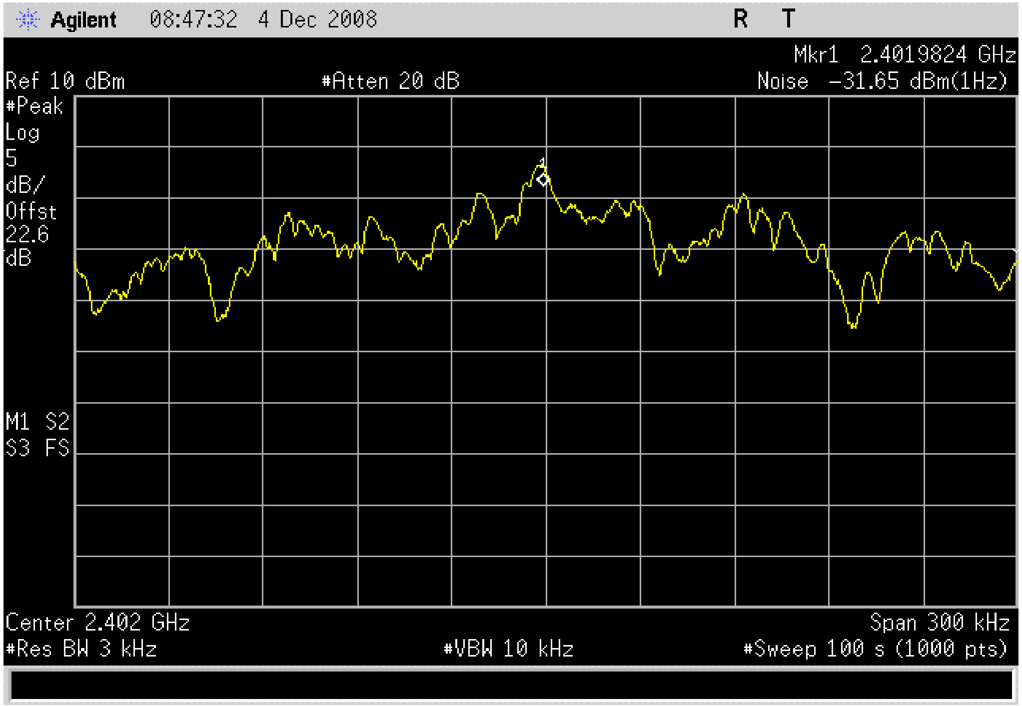
No Deviations

Configuration #	**1**	*Signature*

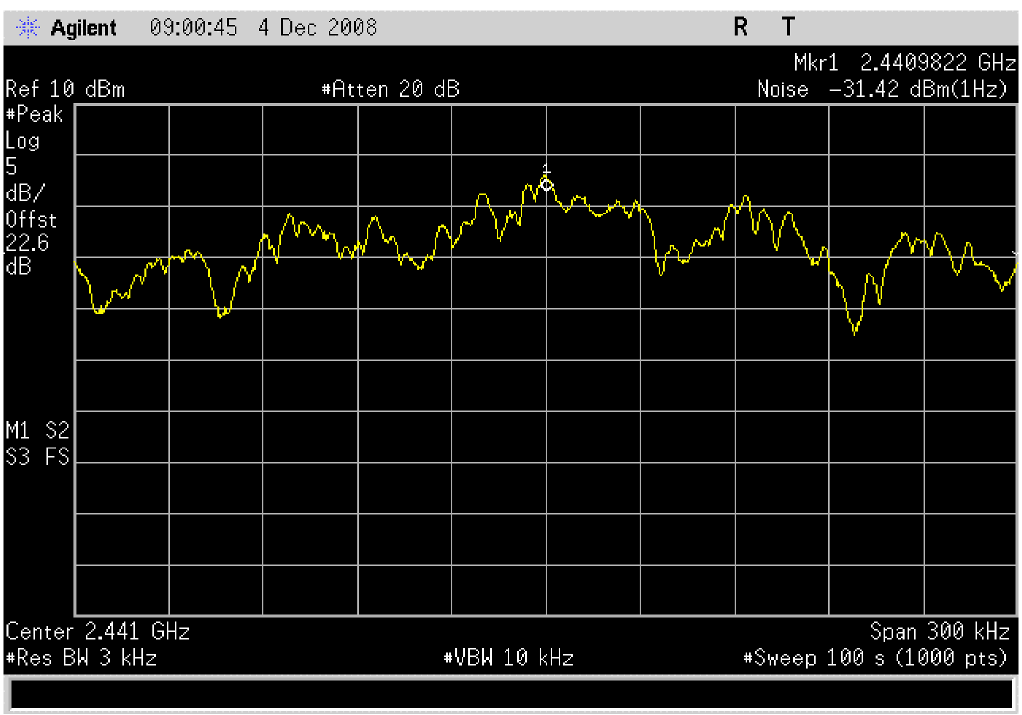
		Value	Limit	Results
Bluetooth, GFSK, DH5, Power (255, 30)				
	Low Channel	3.2 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	Mid Channel	3.4 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	High Channel	3.4 dBm / 3 kHz	8 dBm / 3 kHz	Pass
Bluetooth, 4-DQPSK, 2DH5, Power (227, 78)				
	Low Channel	0.6 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	Mid Channel	0.6 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	High Channel	-1.1 dBm / 3 kHz	8 dBm / 3 kHz	Pass
Bluetooth, 8-DPSK, 3DH5, Power (227, 78)				
	Low Channel	0.8 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	Mid Channel	1.2 dBm / 3 kHz	8 dBm / 3 kHz	Pass
	High Channel	-0.2 dBm / 3 kHz	8 dBm / 3 kHz	Pass

POWER SPECTRAL DENSITY

Bluetooth, GFSK, DH5, Power (255, 30), Low Channel					
Result:	Pass	**Value:**	3.2 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

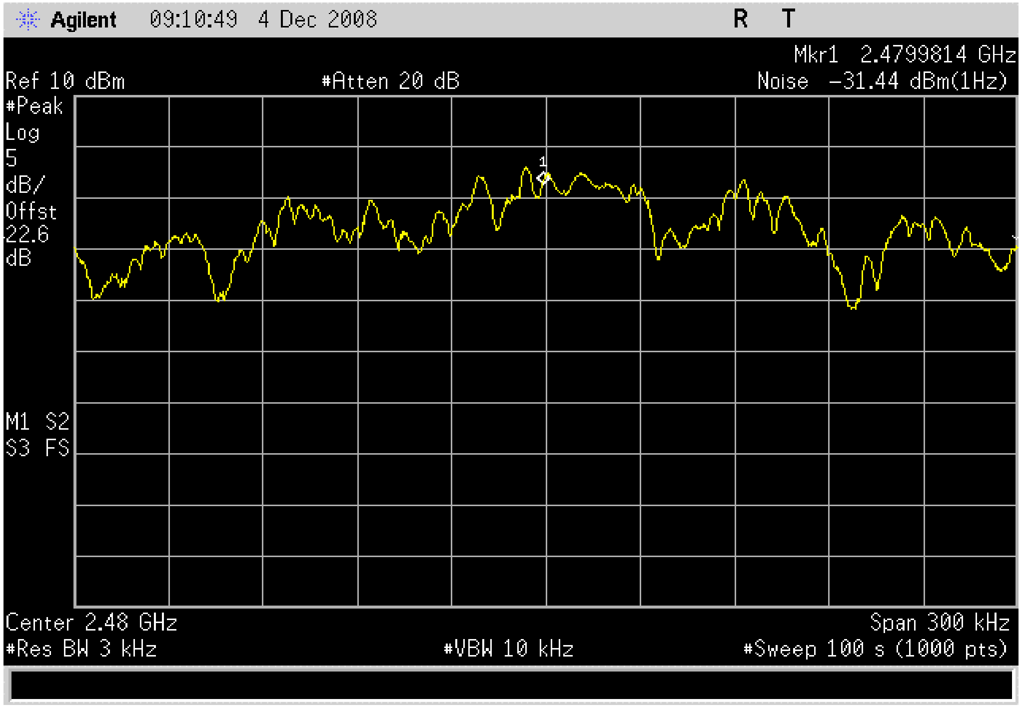


Bluetooth, GFSK, DH5, Power (255, 30), Mid Channel					
Result:	Pass	**Value:**	3.4 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

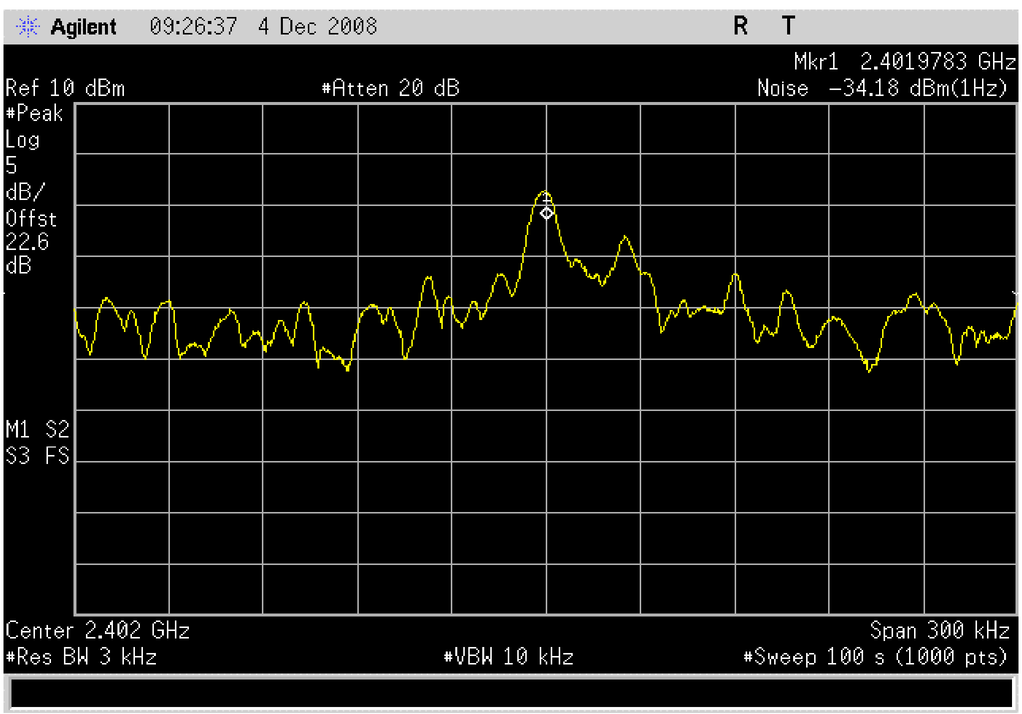


POWER SPECTRAL DENSITY

Bluetooth, GFSK, DH5, Power (255, 30), High Channel					
Result:	Pass	**Value:**	3.4 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

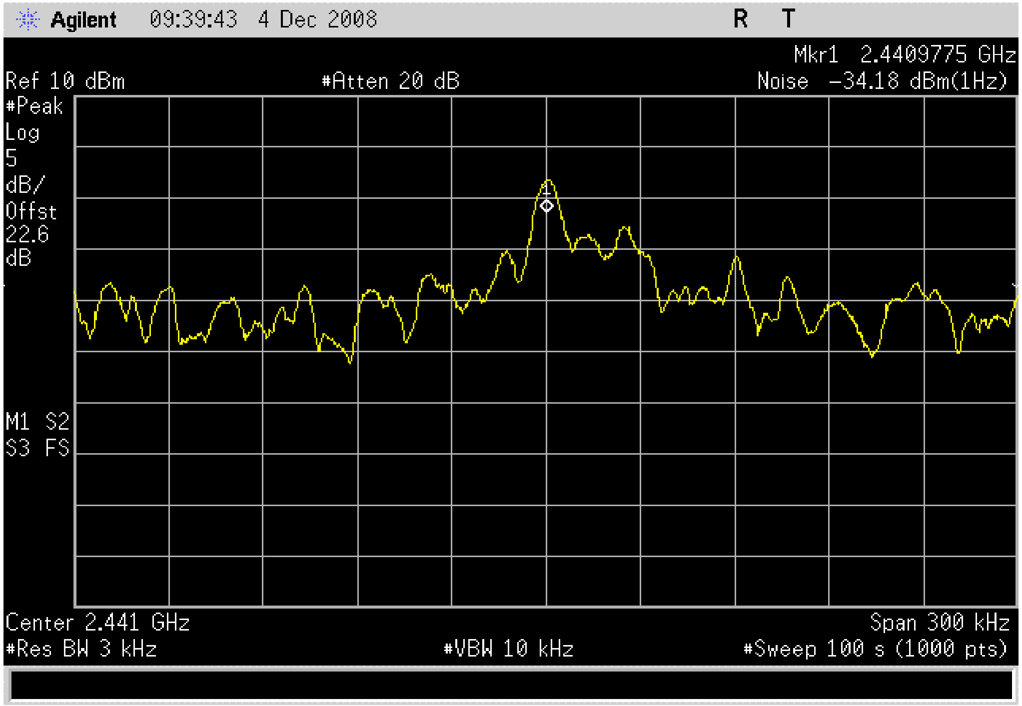


Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Low Channel					
Result:	Pass	**Value:**	0.6 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

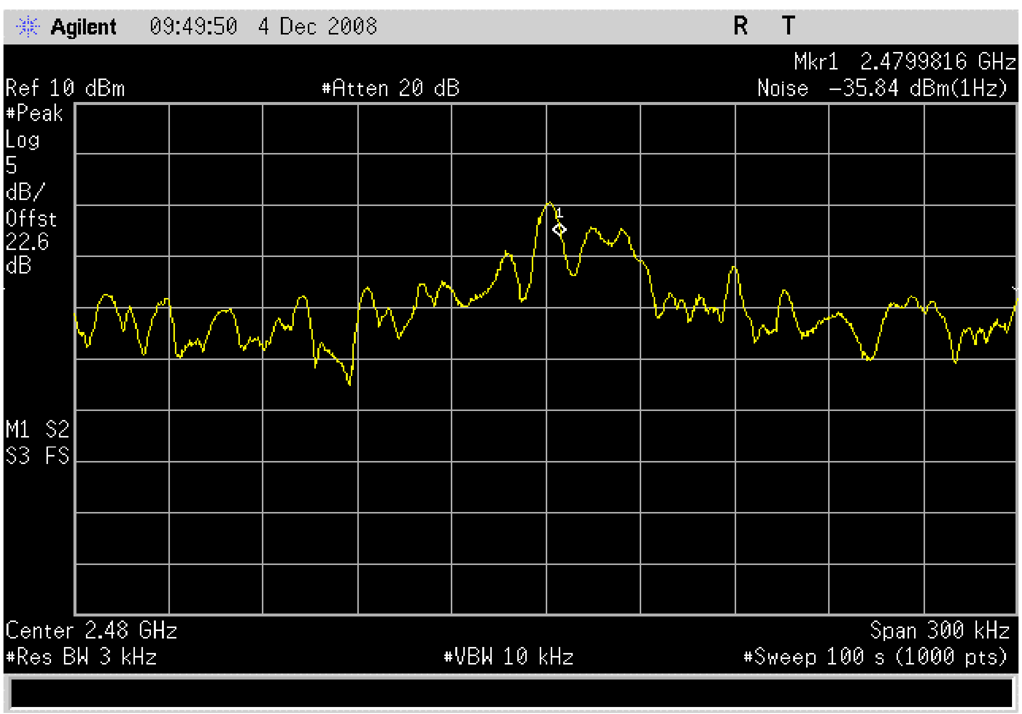


POWER SPECTRAL DENSITY

Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), Mid Channel					
Result:	Pass	**Value:**	0.6 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

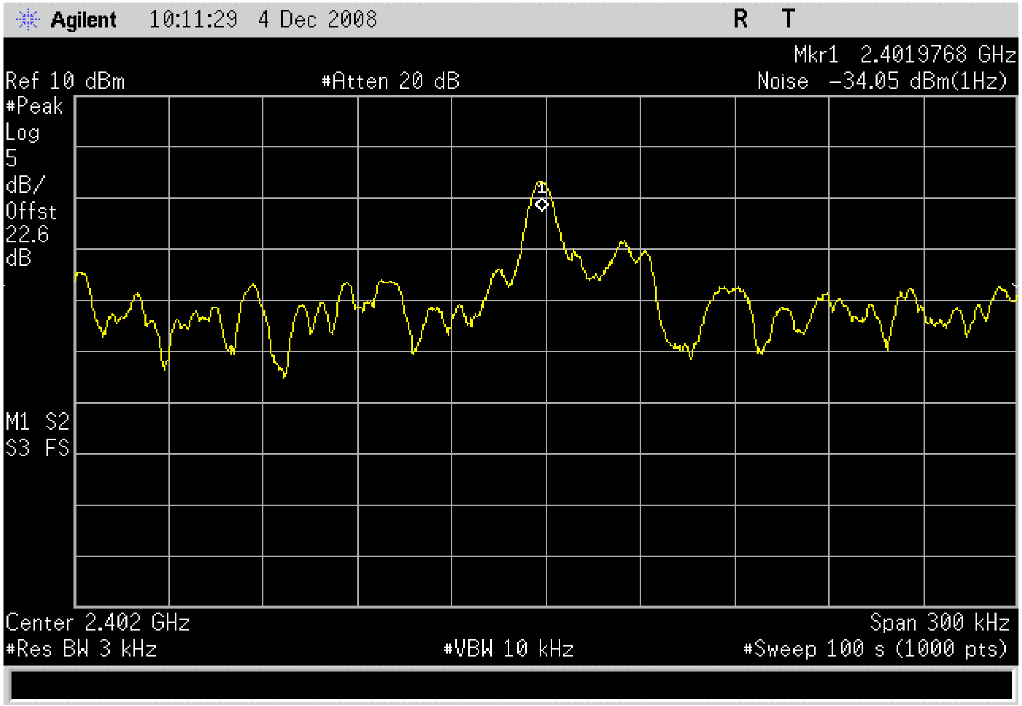


Bluetooth, 4-DQPSK, 2DH5, Power (227, 78), High Channel					
Result:	Pass	**Value:**	-1.1 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

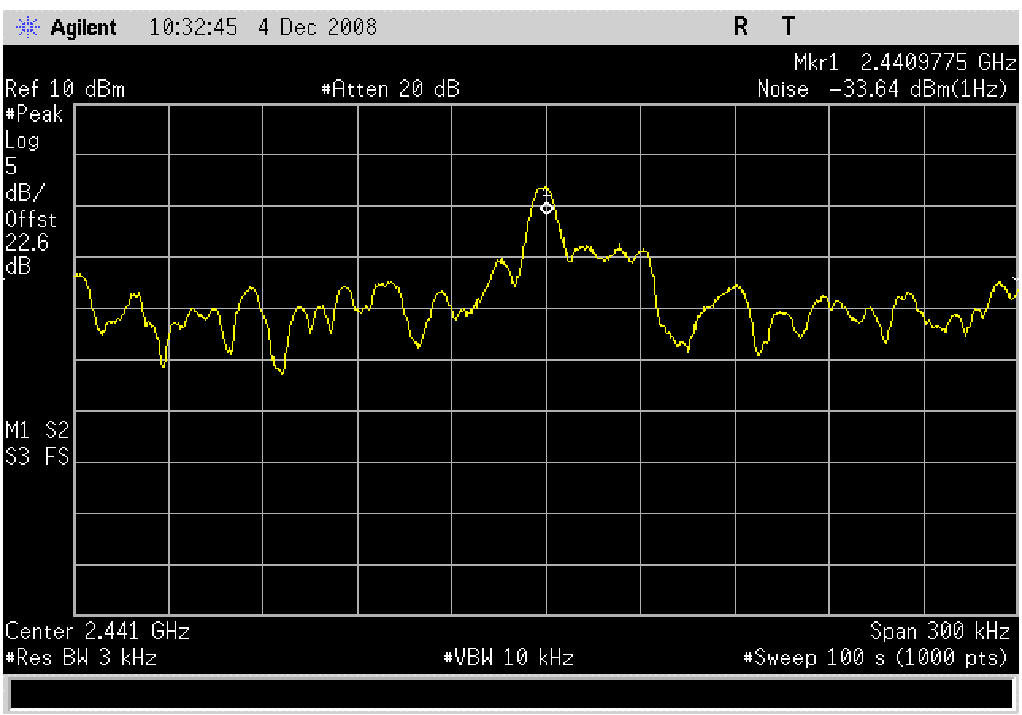


POWER SPECTRAL DENSITY

Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Low Channel					
Result:	Pass	**Value:**	0.8 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

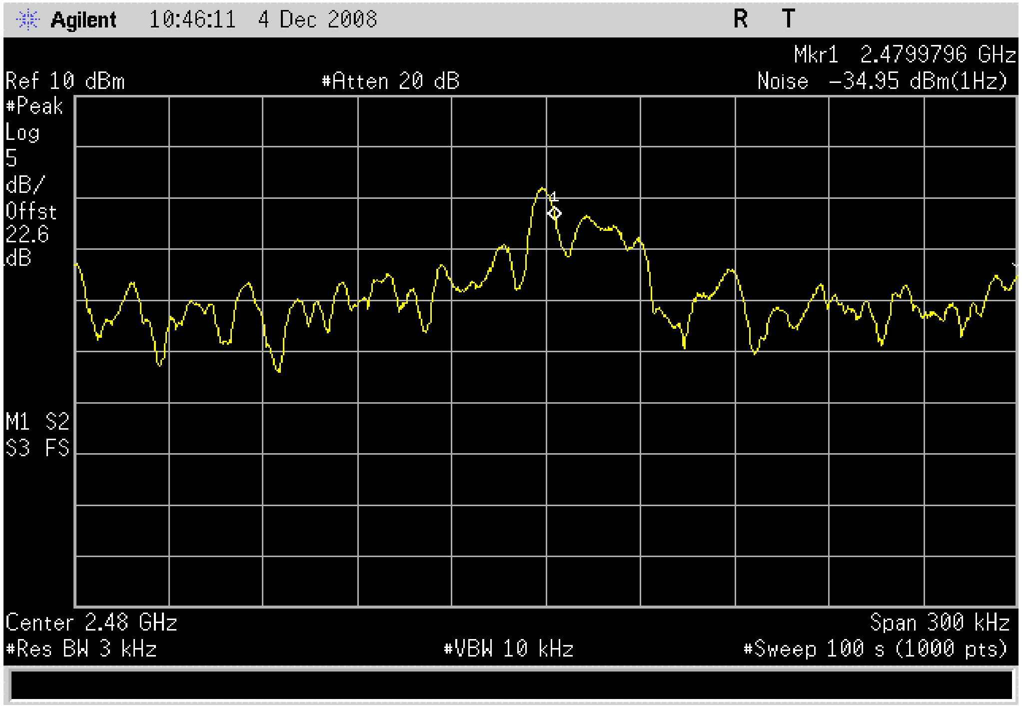


Bluetooth, 8-DPSK, 3DH5, Power (227, 78), Mid Channel					
Result:	Pass	**Value:**	1.2 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz



POWER SPECTRAL DENSITY

Bluetooth, 8-DPSK, 3DH5, Power (227, 78), High Channel					
Result:	Pass	**Value:**	-0.2 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz



SPURIOUS RADIATED 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

Continuous Tx Bluetooth,

MODE USED FOR FINAL DATA

Continuous Tx Bluetooth,

POWER SETTINGS INVESTIGATED

120V, 60Hz

POWER SETTINGS USED FOR FINAL DATA

120V, 60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency	30MHz	Stop Frequency	26GHz

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
EV01 Cables		Standard Gain Horns Cables	EVF	11/13/2008	13
Antenna, Horn	ETS	3160-07	AHU	NCR	0
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	6/30/2008	13
Antenna, Horn	EMCO	3115	AHC	8/12/2008	24
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	5/19/2008	13
EV01 Cables		Double Ridge Horn Cables	EVB	5/19/2008	13
Antenna, Biconilog	EMCO	3141	AXE	1/15/2008	24
Pre-Amplifier	Miteq	AM-1616-1000	AOL	5/19/2008	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVD	6/30/2008	13
Antenna, Horn	ETS	3160-08	AHV	NCR	0
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	12/2/2008	13
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
EV01 Cables		18-26GHz Standar Gain Horn Cable	EVD	12/2/2008	13
EV01 Cables		Bilog Cables	EVA	5/19/2008	13

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

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

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. 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 C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Per FCC Public Notice DA 00-705 (2000), “If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms). As seen on page 78 of SGS Report No: ER/2006/70001, the longest duration for a single pulse is 2.925 ms. The maximum high time in any 100 ms period is 11.85 ms. Therefore the duty cycle correction factor is –18.5 dB.

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SPURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**	**Work Order:**	**SPTE0102**
Serial Number:	**See Configurations**	**Date:**	**12/02/08**
Customer:	**Spectrum Technology, Inc.**	**Temperature:**	**21.8° C**
Attendees:	**Rod Munro**	**Humidity:**	**44%**
Project:	**None**	**Barometric Pres.:**	**1020.0mb**
Tested by:	**David Divergigelis** **Power:** **120V, 60Hz**	**Job Site:**	**EV01**

TEST SPECIFICATIONS	Test Method
FCC 15.247 (FHSS):2008	ANSI C63.4:2003, DA 00-705:2000

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

None

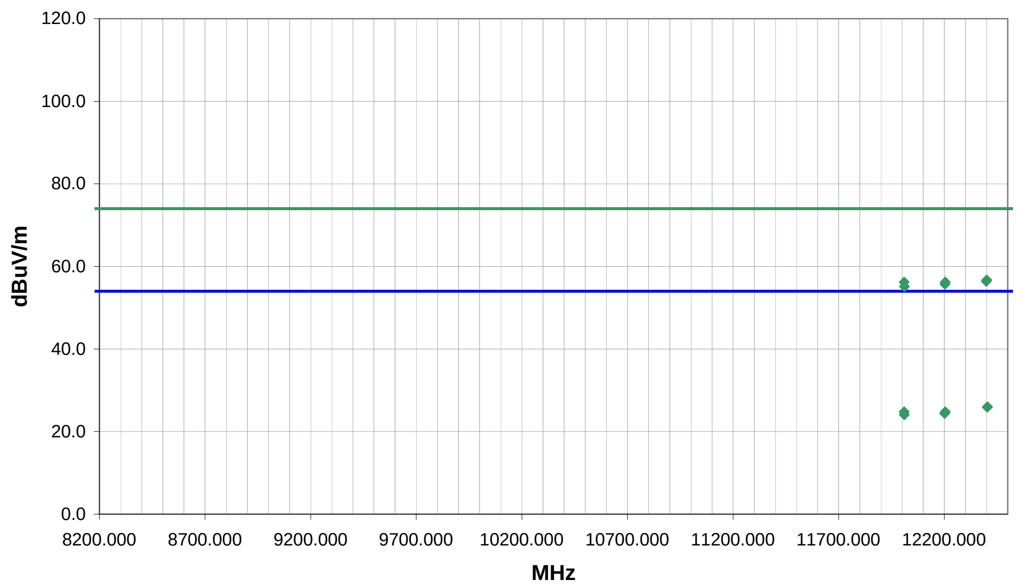
EUT OPERATING MODES

Continuous Tx Bluetooth,

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	15	
Configuration #	2	
Results	Pass	*Signature*



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Duty Cycle Correction (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
12400.570	36.2	20.5	284.0	1.0	3.0	0.0	H-Horn	PK	0.0	56.7	74.0	-17.3	DH5, High Channel
12398.130	35.9	20.5	183.0	1.0	3.0	0.0	V-Horn	PK	0.0	56.4	74.0	-17.6	DH5, High Channel
12009.460	37.0	19.2	278.0	1.2	3.0	0.0	V-Horn	PK	0.0	56.2	74.0	-17.8	DH5, Low Channel
12204.620	36.3	19.9	114.0	1.0	3.0	0.0	V-Horn	PK	0.0	56.2	74.0	-17.8	DH5, Mid Channel
12203.050	35.8	19.9	34.0	3.5	3.0	0.0	H-Horn	PK	0.0	55.7	74.0	-18.3	DH5, Mid Channel
12011.390	35.9	19.2	120.0	1.6	3.0	0.0	H-Horn	PK	0.0	55.1	74.0	-18.9	DH5, Low Channel
12404.450	24.0	20.5	284.0	1.0	3.0	0.0	H-Horn	AV	-18.5	26.0	54.0	-28.0	DH5, High Channel
12403.130	23.9	20.5	183.0	1.0	3.0	0.0	V-Horn	AV	-18.5	25.9	54.0	-28.1	DH5, High Channel
12009.490	24.1	19.2	278.0	1.2	3.0	0.0	V-Horn	AV	-18.5	24.8	54.0	-29.2	DH5, Low Channel
12204.220	23.4	19.9	114.0	1.0	3.0	0.0	V-Horn	AV	-18.5	24.8	54.0	-29.2	DH5, Mid Channel
12201.170	23.0	19.9	34.0	3.5	3.0	0.0	H-Horn	AV	-18.5	24.4	54.0	-29.6	DH5, Mid Channel
12010.330	23.4	19.2	120.0	1.6	3.0	0.0	H-Horn	AV	-18.5	24.1	54.0	-29.9	DH5, Low Channel

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SPURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**	**Work Order:**	**SPTE0102**
Serial Number:	**See Configurations**	**Date:**	**12/02/08**
Customer:	**Spectrum Technology, Inc.**	**Temperature:**	**20.8° C**
Attendees:	**Rod Munro**	**Humidity:**	**42%**
Project:	**None**	**Barometric Pres.:**	**1027.6mb**
Tested by:	**Dan Haas** **Power:** **120V, 60Hz**	**Job Site:**	**EV01**

TEST SPECIFICATIONS	Test Method
FCC 15.247 (FHSS):2007	ANSI C63.4:2003, DA 00-705:2000

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	**Test Distance (m)**	3

COMMENTS

None

EUT OPERATING MODES

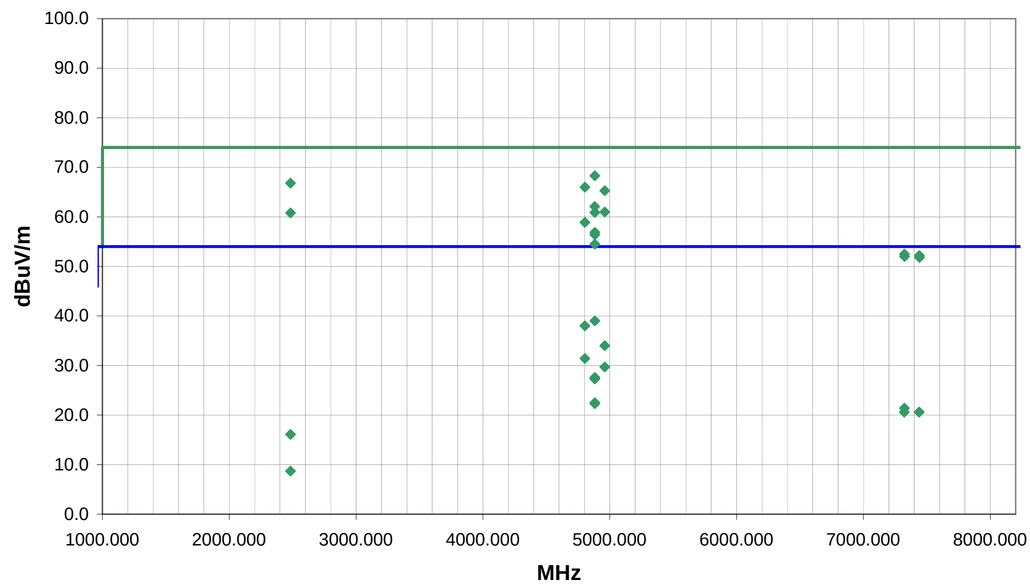
Continuous Tx Bluetooth,

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	**16**
Configuration #	**3**
Results	**Pass**

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Duty Cycle Correction (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
4881.745	58.5	9.8	252.0	1.0	3.0	0.0	V-Horn	PK	0.0	68.3	74.0	-5.7	Mid channel, DH5
2483.501	44.6	2.2	10.0	1.0	3.0	20.0	V-Horn	PK	0.0	66.8	74.0	-7.2	High channel, DH5
4804.320	56.5	9.5	323.0	1.0	3.0	0.0	V-Horn	PK	0.0	66.0	74.0	-8.0	Low channel, DH5
4960.185	55.2	10.1	230.0	1.6	3.0	0.0	V-Horn	PK	0.0	65.3	74.0	-8.7	High channel, DH5
4881.215	52.3	9.8	135.0	2.3	3.0	0.0	V-Horn	PK	0.0	62.1	74.0	-11.9	Mid channel, 3DH5
4959.755	50.9	10.1	-1.0	1.6	3.0	0.0	H-Horn	PK	0.0	61.0	74.0	-13.0	High channel, DH5
4881.760	51.1	9.8	251.0	1.0	3.0	0.0	V-Horn	PK	0.0	60.9	74.0	-13.1	Mid channel, 2DH5
2483.501	38.6	2.2	312.0	1.5	3.0	20.0	H-Horn	PK	0.0	60.8	74.0	-13.2	High channel, DH5
4881.995	47.7	9.8	252.0	1.0	3.0	0.0	V-Horn	AV	-18.5	39.0	54.0	-15.0	Mid channel, DH5
4804.350	49.4	9.5	24.0	1.3	3.0	0.0	H-Horn	PK	0.0	58.9	74.0	-15.1	Low channel, DH5
4804.005	47.0	9.5	323.0	1.0	3.0	0.0	V-Horn	AV	-18.5	38.0	54.0	-16.0	Low channel, DH5
4881.760	47.1	9.8	360.0	1.5	3.0	0.0	H-Horn	PK	0.0	56.9	74.0	-17.1	Mid channel, 3DH5
4881.890	46.6	9.8	360.0	2.2	3.0	0.0	H-Horn	PK	0.0	56.4	74.0	-17.6	Mid channel, 2DH5
4881.605	44.7	9.8	195.0	1.5	3.0	0.0	H-Horn	PK	0.0	54.5	74.0	-19.5	Mid channel, DH5
4960.000	42.4	10.1	230.0	1.6	3.0	0.0	V-Horn	AV	-18.5	34.0	54.0	-20.0	High channel, DH5
7323.255	36.9	15.6	23.0	1.0	3.0	0.0	V-Horn	PK	0.0	52.5	74.0	-21.5	Mid channel, DH5
7440.130	36.4	15.8	269.0	2.1	3.0	0.0	V-Horn	PK	0.0	52.2	74.0	-21.8	High channel, DH5
7323.995	36.4	15.6	91.0	1.0	3.0	0.0	H-Horn	PK	0.0	52.0	74.0	-22.0	Mid channel, DH5
7441.355	36.0	15.8	279.0	1.8	3.0	0.0	H-Horn	PK	0.0	51.8	74.0	-22.2	High channel, DH5
4804.000	40.4	9.5	24.0	1.3	3.0	0.0	H-Horn	AV	-18.5	31.4	54.0	-22.6	Low channel, DH5
4960.025	38.1	10.1	-1.0	1.6	3.0	0.0	H-Horn	AV	-18.5	29.7	54.0	-24.3	High channel, DH5
4882.050	36.3	9.8	251.0	1.0	3.0	0.0	V-Horn	AV	-18.5	27.6	54.0	-26.4	Mid channel, 2DH5
4881.995	36.0	9.8	135.0	2.3	3.0	0.0	V-Horn	AV	-18.5	27.3	54.0	-26.7	Mid channel, 3DH5
4882.005	36.0	9.8	195.0	1.5	3.0	0.0	H-Horn	AV	-18.5	27.3	54.0	-26.7	Mid channel, DH5
4882.015	31.2	9.8	360.0	1.5	3.0	0.0	H-Horn	AV	-18.5	22.5	54.0	-31.5	Mid channel, 3DH5
4882.025	31.0	9.8	360.0	2.2	3.0	0.0	H-Horn	AV	-18.5	22.3	54.0	-31.7	Mid channel, 2DH5
7322.990	24.3	15.6	23.0	1.0	3.0	0.0	V-Horn	AV	-18.5	21.4	54.0	-32.6	Mid channel, DH5
7321.155	23.5	15.6	91.0	1.0	3.0	0.0	H-Horn	AV	-18.5	20.6	54.0	-33.4	Mid channel, DH5
7439.070	23.3	15.8	279.0	1.8	3.0	0.0	H-Horn	AV	-18.5	20.6	54.0	-33.4	High channel, DH5
7439.295	23.3	15.8	269.0	2.1	3.0	0.0	V-Horn	AV	-18.5	20.6	54.0	-33.4	High channel, DH5
2483.501	32.4	2.2	10.0	1.0	3.0	20.0	V-Horn	AV	-18.5	16.1	54.0	-37.9	High channel, DH5
2483.501	25.0	2.2	312.0	1.5	3.0	20.0	H-Horn	AV	-18.5	8.7	54.0	-45.3	High channel, DH5

NORTHWEST

EMC

SPURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	**GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth**	**Work Order:**	**SPTE0102**
Serial Number:	**See Configurations**	**Date:**	**12/02/08**
Customer:	**Spectrum Technology, Inc.**	**Temperature:**	**20.8° C**
Attendees:	**Rod Munro**	**Humidity:**	**42%**
Project:	**None**	**Barometric Pres.:**	**1027.6mb**
Tested by:	**Dan Haas** **Power:** **120V, 60Hz**	**Job Site:**	**EV01**

TEST SPECIFICATIONS — Test Method

FCC 15.247 (FHSS):2007 — ANSI C63.4:2003, DA 00-705:2000

TEST PARAMETERS

Antenna Height(s) (m) 1 - 4   **Test Distance (m)** 3

COMMENTS

None

EUT OPERATING MODES

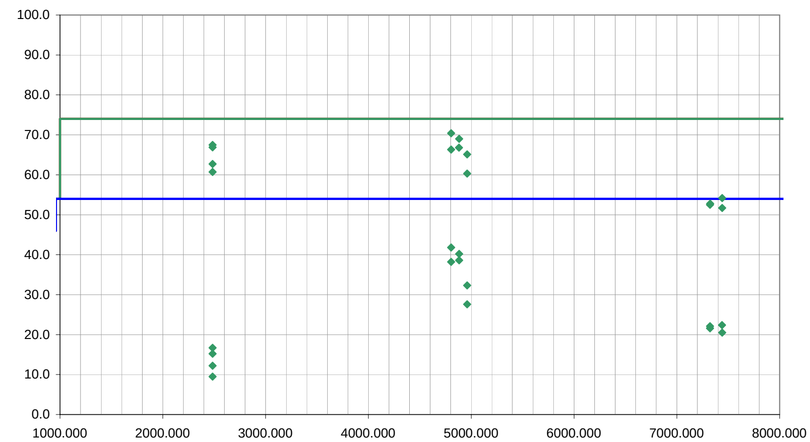
Continuous Tx Bluetooth,

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	**17**
Configuration #	**2**
Results	**Pass**

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Duty Cycle Correction (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
4804.620	60.9	9.5	321.0	1.0	3.0	0.0	H-Horn	PK	0.0	70.4	74.0	-3.6	Low channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4882.340	59.2	9.8	353.0	1.5	3.0	0.0	H-Horn	PK	0.0	69.0	74.0	-5.0	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
2483.501	45.3	2.2	336.0	1.0	3.0	20.0	H-Horn	PK	0.0	67.5	74.0	-6.5	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
2483.501	44.7	2.2	332.0	1.0	3.0	20.0	H-Horn	PK	0.0	66.9	74.0	-7.1	High channel, DH5, Laptop base vertical, display face-down, stand-alone.
4880.795	57.0	9.8	358.0	2.3	3.0	0.0	V-Horn	PK	0.0	66.8	74.0	-7.2	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4804.330	56.8	9.5	346.0	1.0	3.0	0.0	V-Horn	PK	0.0	66.3	74.0	-7.7	Low channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4959.665	55.0	10.1	330.0	1.0	3.0	0.0	H-Horn	PK	0.0	65.1	74.0	-8.9	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
2483.501	40.5	2.2	4.0	1.3	3.0	20.0	V-Horn	PK	0.0	62.7	74.0	-11.3	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4804.010	50.8	9.5	321.0	1.0	3.0	0.0	H-Horn	AV	-18.5	41.8	54.0	-12.2	Low channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
2483.501	38.5	2.2	360.0	1.6	3.0	20.0	V-Horn	PK	0.0	60.7	74.0	-13.3	High channel, DH5, Laptop base vertical, display face-down, stand-alone.
4960.285	50.2	10.1	361.0	1.4	3.0	0.0	V-Horn	PK	0.0	60.3	74.0	-13.7	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4882.000	48.9	9.8	353.0	1.5	3.0	0.0	H-Horn	AV	-18.5	40.2	54.0	-13.8	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4882.025	47.3	9.8	358.0	2.3	3.0	0.0	V-Horn	AV	-18.5	38.6	54.0	-15.4	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4804.030	47.2	9.5	346.0	1.0	3.0	0.0	V-Horn	AV	-18.5	38.2	54.0	-15.8	Low channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7440.535	38.4	15.8	10.0	1.0	3.0	0.0	V-Horn	PK	0.0	54.2	74.0	-19.8	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7323.790	37.2	15.6	3.0	1.0	3.0	0.0	V-Horn	PK	0.0	52.8	74.0	-21.2	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7323.220	36.9	15.6	42.0	1.0	3.0	0.0	H-Horn	PK	0.0	52.5	74.0	-21.5	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4960.005	40.7	10.1	330.0	1.0	3.0	0.0	H-Horn	AV	-18.5	32.3	54.0	-21.7	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7441.300	35.9	15.8	262.0	3.6	3.0	0.0	H-Horn	PK	0.0	51.7	74.0	-22.3	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
4960.000	36.0	10.1	361.0	1.4	3.0	0.0	V-Horn	AV	-18.5	27.6	54.0	-26.4	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7440.045	25.1	15.8	10.0	1.0	3.0	0.0	V-Horn	AV	-18.5	22.4	54.0	-31.6	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7322.970	25.0	15.6	3.0	1.0	3.0	0.0	V-Horn	AV	-18.5	22.1	54.0	-31.9	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7322.885	24.5	15.6	42.0	1.0	3.0	0.0	H-Horn	AV	-18.5	21.6	54.0	-32.4	Mid channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
7440.180	23.2	15.8	262.0	3.6	3.0	0.0	H-Horn	AV	-18.5	20.5	54.0	-33.5	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
2483.501	33.0	2.2	336.0	1.0	3.0	20.0	H-Horn	AV	-18.5	16.7	54.0	-37.3	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
2483.501	31.5	2.2	332.0	1.0	3.0	20.0	H-Horn	AV	-18.5	15.2	54.0	-38.8	High channel, DH5, Laptop base vertical, display face-down, stand-alone.
2483.501	28.5	2.2	4.0	1.3	3.0	20.0	V-Horn	AV	-18.5	12.2	54.0	-41.8	High channel, DH5, Laptop on it's side, Bluetooth antenna up, stand-alone.
2483.501	25.8	2.2	360.0	1.6	3.0	20.0	V-Horn	AV	-18.5	9.5	54.0	-44.5	High channel, DH5, Laptop base vertical, display face-down, stand-alone.

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

Continuous TX Bluetooth, High Channel.
Continuous TX Bluetooth, Mid Channel.
Continuous TX Bluetooth, Low Channel.

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SPTE0102 - 2

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
LISN	Solar	9252-50-R-24-BNC	LIR	1/4/2008	13 mo
LISN	Solar	9252-50-R-24-BNC	LIP	1/4/2008	13 mo
EV07 Cables		Conducted Cables	EVG	5/2/2008	13 mo
High Pass Filter	T.T.E.	7766	HFG	2/5/2008	13 mo
Attenuator	Coaxicom	66702 2910-20	ATO	6/30/2008	13 mo
Receiver	Rohde & Schwarz	ESCI	ARH	8/28/2008	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

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

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

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

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2008.07.07
Version 2008.3.31

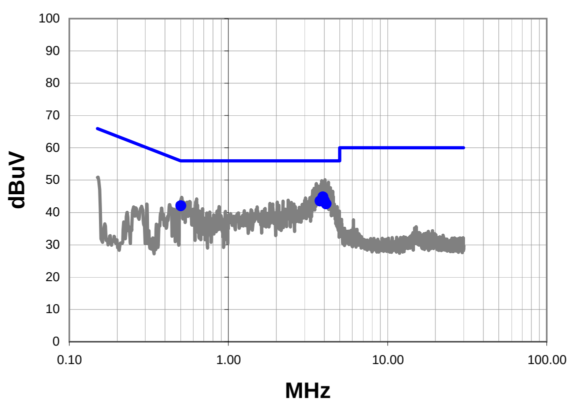
Work Order:	SPTE0102	**Date:**	12/03/08	
Project:	None	**Temperature:**	20.8° C	
Job Site:	EV07	**Humidity:**	42.4	
Serial Number:	See Configurations	**Barometric Pres.:**	1027.6mb	**Tested by:** David DiVergigelis

EUT:	GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth
Configuration:	2
Customer:	Spectrum Technology, Inc.
Attendees:	Rod Munro
EUT Power:	120VAC/60Hz
Operating Mode:	Continuous TX Bluetooth, Low Channel.
Deviations:	No deviations.
Comments:	None

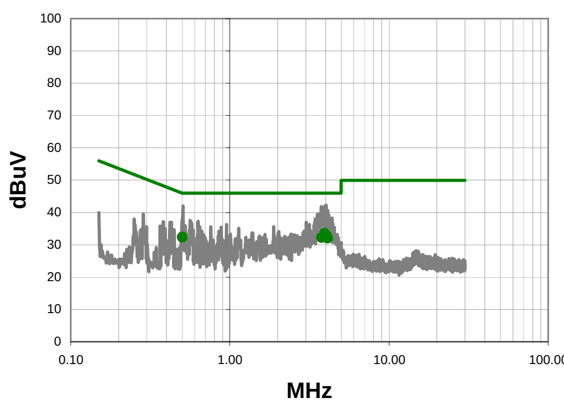
Test Specifications	**Test Method**
FCC 15.207:2008	ANSI C63.4:2003

Run #	3	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.936	24.2	20.6	44.8	56.0	-11.2
4.004	23.1	20.6	43.7	56.0	-12.3
3.764	22.9	20.6	43.5	56.0	-12.5
4.044	22.6	20.6	43.2	56.0	-12.8
4.124	22.0	20.6	42.6	56.0	-13.4
0.503	21.2	20.9	42.1	56.0	-13.9

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.936	12.9	20.6	33.5	46.0	-12.5
4.004	12.3	20.6	32.9	46.0	-13.1
4.044	12.2	20.6	32.8	46.0	-13.2
0.503	11.5	20.9	32.4	46.0	-13.6
3.764	11.6	20.6	32.2	46.0	-13.8
4.124	11.4	20.6	32.0	46.0	-14.0

AC POWERLINE CONDUCTED EMISSIONS

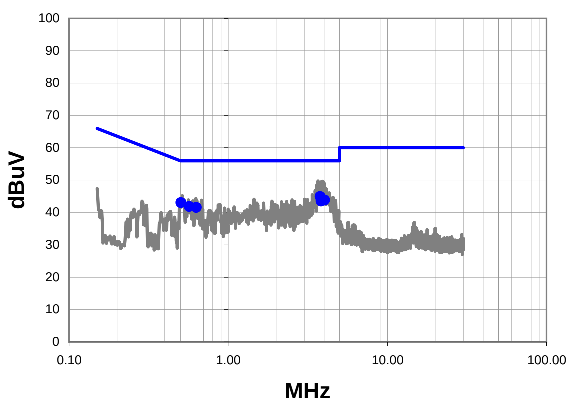
PSA-ESCI 2008.07.07
Version 2008.3.31

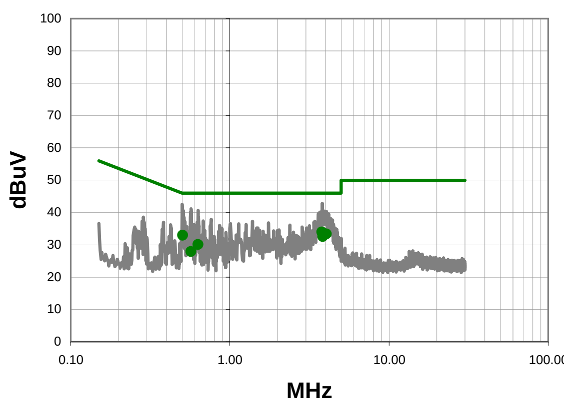
Work Order:	SPTE0102	**Date:**	12/03/08	
Project:	None	**Temperature:**	20.8° C	
Job Site:	EV07	**Humidity:**	42.4	
Serial Number:	See Configurations	**Barometric Pres.:**	1027.6mb	**Tested by:** David DiVergigelis

EUT:	GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth
Configuration:	2
Customer:	Spectrum Technology, Inc.
Attendees:	Rod Munro
EUT Power:	120VAC/60Hz
Operating Mode:	Continuous TX Bluetooth, Low Channel.
Deviations:	No deviations.
Comments:	None

Test Specifications	Test Method
FCC 15.207:2008	ANSI C63.4:2003

Run #	4	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.796	24.3	20.6	44.9	56.0	-11.1
4.040	23.2	20.6	43.8	56.0	-12.2
3.836	22.9	20.6	43.5	56.0	-12.5
0.506	22.1	20.9	43.0	56.0	-13.0
0.570	21.0	20.8	41.8	56.0	-14.2
0.631	20.7	20.8	41.5	56.0	-14.5

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.796	13.3	20.6	33.9	46.0	-12.1
4.040	12.7	20.6	33.3	46.0	-12.7
0.506	12.1	20.9	33.0	46.0	-13.0
3.836	11.9	20.6	32.5	46.0	-13.5
0.631	9.3	20.8	30.1	46.0	-15.9
0.570	7.0	20.8	27.8	46.0	-18.2

NORTHWEST
EMC

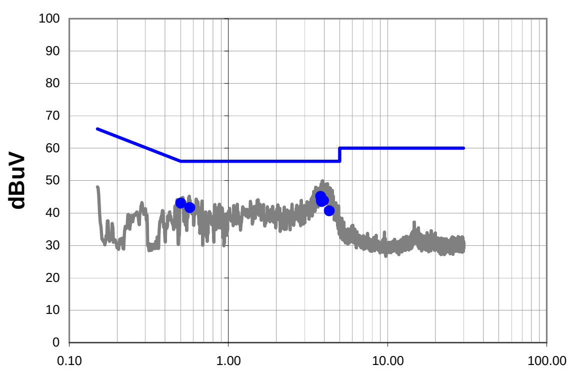
AC POWERLINE CONDUCTED EMISSIONS

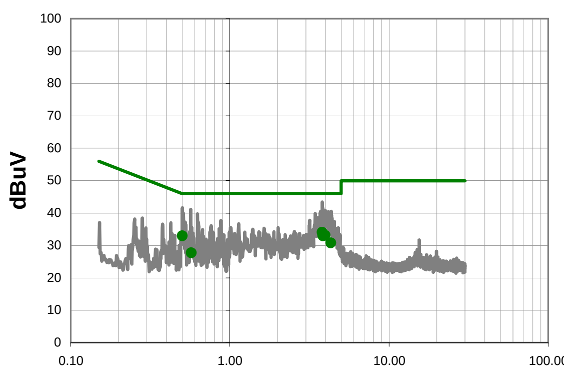
PSA-ESCI 2008.07.07
Version 2008.3.31

Work Order:	SPTE0102	**Date:**	12/03/08	
Project:	None	**Temperature:**	20.8° C	
Job Site:	EV07	**Humidity:**	42.4	
Serial Number:	See Configurations	**Barometric Pres.:**	1027.6mb	**Tested by:** David DiVergigelis
EUT:	GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth			
Configuration:	2			
Customer:	Spectrum Technology, Inc.			
Attendees:	Rod Munro			
EUT Power:	120VAC/60Hz			
Operating Mode:	Continuous TX Bluetooth, Mid Channel.			
Deviations:	No deviations.			
Comments:	None			

Test Specifications	**Test Method**
FCC 15.207:2008	ANSI C63.4:2003

Run #	5	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.804	24.5	20.6	45.1	56.0	-10.9
3.976	23.2	20.6	43.8	56.0	-12.2
3.844	23.2	20.6	43.8	56.0	-12.2
3.860	22.9	20.6	43.5	56.0	-12.5
0.504	22.1	20.9	43.0	56.0	-13.0
0.572	20.8	20.8	41.6	56.0	-14.4
4.316	20.0	20.6	40.6	56.0	-15.4

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.804	13.4	20.6	34.0	46.0	-12.0
3.976	12.5	20.6	33.1	46.0	-12.9
3.844	12.4	20.6	33.0	46.0	-13.0
0.504	12.1	20.9	33.0	46.0	-13.0
3.860	12.3	20.6	32.9	46.0	-13.1
4.316	10.1	20.6	30.7	46.0	-15.3
0.572	6.8	20.8	27.6	46.0	-18.4

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2008.07.07
Version 2008.3.31

Work Order:	SPTE0102	**Date:**	12/03/08		
Project:	None	**Temperature:**	20.8° C		
Job Site:	EV07	**Humidity:**	42.4		
Serial Number:	See Configurations	**Barometric Pres.:**	1027.6mb	**Tested by:**	David DiVergigelis

EUT: GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth

Configuration: 2

Customer: Spectrum Technology, Inc.

Attendees: Rod Munro

EUT Power: 120VAC/60Hz

Operating Mode: Continuous TX Bluetooth, Mid Channel.

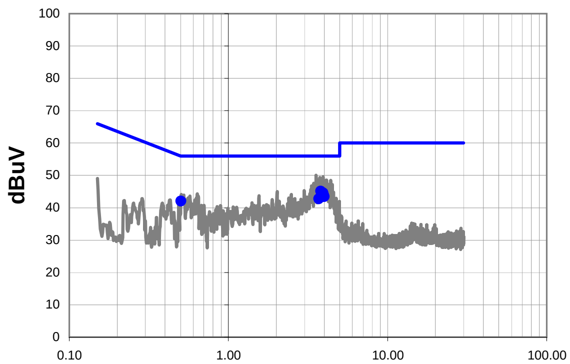
Deviations: No deviations.

Comments: None

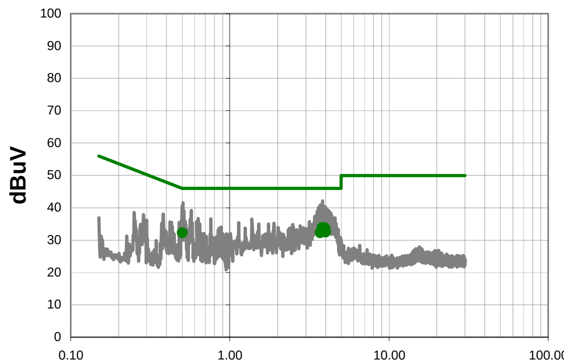
Test Specifications	**Test Method**
FCC 15.207:2008	ANSI C63.4:2003

Run #	6	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.808	24.5	20.6	45.1	56.0	-10.9
3.936	24.0	20.6	44.6	56.0	-11.4
3.964	23.3	20.6	43.9	56.0	-12.1
4.012	22.8	20.6	43.4	56.0	-12.6
3.696	22.1	20.6	42.7	56.0	-13.3
0.503	21.2	20.9	42.1	56.0	-13.9

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.936	13.2	20.6	33.8	46.0	-12.2
3.808	13.2	20.6	33.8	46.0	-12.2
3.964	12.9	20.6	33.5	46.0	-12.5
4.012	11.8	20.6	32.4	46.0	-13.6
0.503	11.4	20.9	32.3	46.0	-13.7
3.696	11.6	20.6	32.2	46.0	-13.8

AC POWERLINE CONDUCTED EMISSIONS

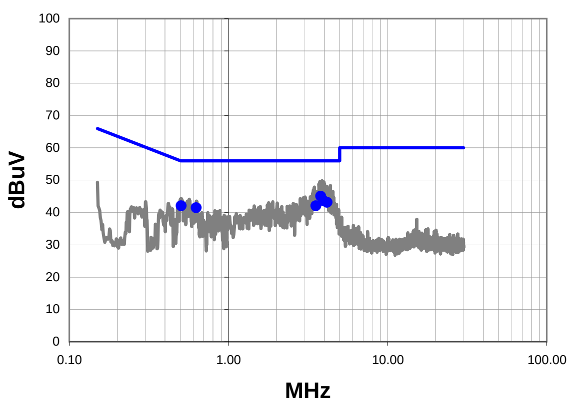
Work Order:	SPTE0102	**Date:**	12/03/08		
Project:	None	**Temperature:**	20.8° C		
Job Site:	EV07	**Humidity:**	42.4		
Serial Number:	See Configurations	**Barometric Pres.:**	1027.6mb	**Tested by:**	David DiVergigelis

EUT:	GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth
Configuration:	2
Customer:	Spectrum Technology, Inc.
Attendees:	Rod Munro
EUT Power:	120VAC/60Hz
Operating Mode:	Continuous TX Bluetooth, High Channel.
Deviations:	No deviations.
Comments:	None

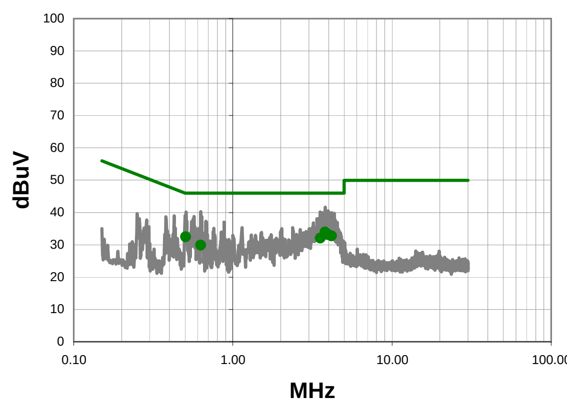
Test Specifications	**Test Method**
FCC 15.207:2008	ANSI C63.4:2003

Run #	7	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.804	24.4	20.6	45.0	56.0	-11.0
3.960	23.0	20.6	43.6	56.0	-12.4
4.172	22.5	20.6	43.1	56.0	-12.9
0.505	21.2	20.9	42.1	56.0	-13.9
3.548	21.4	20.6	42.0	56.0	-14.0
0.629	20.6	20.8	41.4	56.0	-14.6

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.804	13.3	20.6	33.9	46.0	-12.1
3.960	12.5	20.6	33.1	46.0	-12.9
4.172	12.1	20.6	32.7	46.0	-13.3
0.505	11.6	20.9	32.5	46.0	-13.5
3.548	11.4	20.6	32.0	46.0	-14.0
0.629	9.1	20.8	29.9	46.0	-16.1

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2008.07.07
Version 2008.3.31

Work Order:	SPTE0102	**Date:**	12/03/08	
Project:	None	**Temperature:**	20.8° C	
Job Site:	EV07	**Humidity:**	42.4	
Serial Number:	See Configurations	**Barometric Pres.:**	1027.6mb	**Tested by:** David DiVergigelis

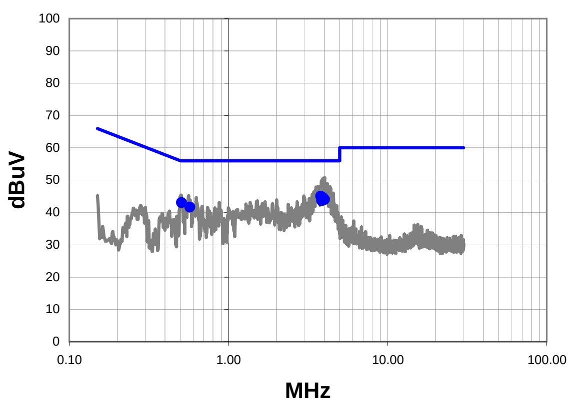
EUT:	GD8000 PC with IX-512AN WLAN, and IX-WT11 Bluetooth
Configuration:	2
Customer:	Spectrum Technology, Inc.
Attendees:	Rod Munro
EUT Power:	120VAC/60Hz
Operating Mode:	Continuous TX Bluetooth, High Channel.
Deviations:	No deviations.
Comments:	None

Test Specifications
FCC 15.207:2008

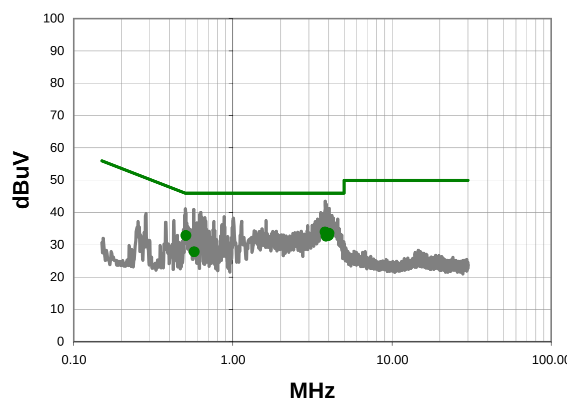
Test Method
ANSI C63.4:2003

Run #	8	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.800	24.4	20.6	45.0	56.0	-11.0
3.928	24.0	20.6	44.6	56.0	-11.4
4.032	23.4	20.6	44.0	56.0	-12.0
3.996	23.3	20.6	43.9	56.0	-12.1
3.864	23.0	20.6	43.6	56.0	-12.4
0.508	22.1	20.9	43.0	56.0	-13.0
0.572	20.8	20.8	41.6	56.0	-14.4

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.800	13.3	20.6	33.9	46.0	-12.1
3.928	13.0	20.6	33.6	46.0	-12.4
4.032	12.9	20.6	33.5	46.0	-12.5
0.508	12.0	20.9	32.9	46.0	-13.1
3.996	12.2	20.6	32.8	46.0	-13.2
3.864	12.0	20.6	32.6	46.0	-13.4
0.572	6.9	20.8	27.7	46.0	-18.3

BLUETOOTH APPROVALS

FCC Procedure Received from Joe Dichoso on 2-15-02

The following exhibit indicates the FCC Spread Spectrum requirements in Section 15.247 for devices meeting the Bluetooth Specifications in the 2.4 GHz band as of February 2001 operating in the USA. The purpose of this exhibit is to help expedite the approval process for Bluetooth devices. This exhibit provides items that vary for each device and also provides a list of items that are common to Bluetooth devices that explains the remaining requirements. The list of common items can be submitted for each application for equipment authorization. This exhibit only specifies requirements in Section 15.247, requirements in other rule Sections for intentional radiators such as in Section 15.203 or 15.207 must be also be addressed. A Bluetooth device is a FHSS transmitter in the data mode and applies as a Hybrid spread spectrum device in the acquisition mode.

For each individual device, the following items, 1-7 will vary from one device to another and must be submitted.

1) The occupied bandwidth in Section 15.247(a)(1)(ii).
2) Conducted output power specified in Section 15.247(b)(1).
3) EIRP limit in Section 15.247(b)(3).
4) RF safety requirement in Section 15.247(b)(4)
5) Spurious emission limits in Section 15.247(c).
6) Processing gain and requirements for Hybrids in Section 15.247(f) in the acquisition mode.
7) Power spectral density requirement in Section 15.247(f) in the acquisition mode.

For all devices, the following items, 1-12, are common to all Bluetooth devices and will not vary from one device to another. This list can be copied into the filing.

1 Output power and channel separation of a Bluetooth device in the different operating modes:

The different operating modes (data-mode, acquisition-mode) of a Bluetooth device don't influence the output power and the channel spacing. There is only one transmitter which is driven by identical input parameters concerning these two parameters.
Only a different hopping sequence will be used. For this reason, the RF parameters in one op-mode is sufficient.

2 Frequency range of a Bluetooth device:

The maximum frequency of the device is: **2402 – 2480 M**Hz.
This is according the Bluetooth Core Specification V 1.0B (+ critical errata) for devices which will be operated in the USA. Other frequency ranges (e.g. for Spain, France, Japan) which are allowed according the Core Specification must **not be** supported by the device.

3 Co-ordination of the hopping sequence in data mode to avoid simultaneous occupancy by multiple transmitters:

Bluetooth units which want to communicate with other units must be organized in a structure called piconet. This piconet consist of max. 8 Bluetooth units. One unit is the master the other seven are the slaves. The master co-ordinates frequency occupation in this piconet for all units. As the master hop sequence is derived from it's BD address which is unique for every Bluetooth device, additional masters intending to establish new piconets will always use different hop sequences.

4 Example of a hopping sequence in data mode:

Example of a 79 hopping sequence in data mode:
40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54, 67,
56, 37, 60, 39, 58, 69, 62, 71, 64, 25, 68, 27, 66, 57, 70, 59,
72, 29, 76, 31, 74, 61, 78, 63, 01, 41, 05, 43, 03, 73, 07, 75,
09, 45, 13, 47, 11, 77, 15, 00, 64, 49, 66, 53, 68, 02, 70, 06,
01, 51, 03, 55, 05, 04

5 Equally average use of frequencies in data mode and short transmissions:

The generation of the hopping sequence in connection mode depends essentially on two input values:

1. LAP/UAP of the master of the connection
2. Internal master clock

The LAP (lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24 MSB's of the 48 BD_ADDRESS. The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronization with other units, only the offsets are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5 µs. The clock has a cycle of about one day (23h30). In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire LAP (24 bits), 4 LSB's (4 bits) (Input 1) and the 27 MSB's of the clock (Input 2) are used. With this input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions, the Bluetooth system has the following behavior:
The first connection between the two devices is established, a hopping sequence is generated. For transmitting the wanted data, the complete hopping sequence is not used and the connection ends. The second connection will be established. A new hopping sequence is generated. Due to the fact that the Bluetooth clock has a different value, because the period between the two transmission is longer (and it cannot be shorter) than the minimum resolution of the clock (312.5 µs). The hopping sequence will always differ from the first one.

6 Receiver input bandwidth, synchronization and repeated single or multiple packets:

The input bandwidth of the receiver is 1 MHz.

In every connection, one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence (see chapter 5). The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g. single or multi-slot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing is according to the packet type of the connection. Also, the slave of the connection uses these settings. Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence

7 Dwell time in data mode

The dwell time of 0.3797s within a 30 second period in data mode is independent from the packet type (packet length). The calculation for a 30 second period is a follows:
Dwell time = time slot length * hop rate / number of hopping channels *30s
Example for a DH1 packet (with a maximum length of one time slot)
Dwell time = 625 µs * 1600 1/s / 79 * 30s = 0.3797s (in a 30s period)

For multi-slot packet the hopping is reduced according to the length of the packet.
Example for a DH5 packet (with a maximum length of five time slots)
Dwell time = 5 * 625 µs * 1600 * 1/5 *1/s / 79 * 30s = 0.3797s (in a 30s period)
This is according the Bluetooth Core Specification V 1.0B (+ critical errata) for all Bluetooth devices. Therefore, all Bluetooth devices **comply** with the FCC dwell time requirement in the data mode.
This was checked during the Bluetooth Qualification tests.
The Dwell time in hybrid mode is approximately 2.6 mS (in a 12.8s period)

8 Channel Separation in hybrid mode

The nominal channel spacing of the Bluetooth system is 1Mhz independent of the operating mode.
The maximum “initial carrier frequency tolerance” which is allowed for Bluetooth is fcenter = 75 kHz.
This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/07-E) for three frequencies (2402, 2441, 2480 MHz).

9 Derivation and examples for a hopping sequence in hybrid mode

For the generation of the inquiry and page hop sequences the same procedures as described for the data mode are used (see item 5), but this time with different input vectors:
**For the inquiry hop sequence, a predefined fixed address is always used. This results in the same 32 frequencies used by all devices doing an inquiry but every time with a different start frequency and phase in this sequence.
**For the page hop sequence, the device address of the paged unit is used as the input vector. This results in the use of a subset of 32 frequencies which is specific for that initial state of the connection establishment between the two units. A page to different devices would result in a different subset of 32 frequencies.
So it is ensured that also in hybrid mode, the frequency is used equally on average.
Example of a hopping sequence in inquiry mode:
48, 50, 09, 13, 52, 54,41, 45, 56, 58, 11, 15, 60, 62, 43, 47, 00, 02, 64, 68, 04, 06, 17, 21, 08, 10, 66, 70, 12, 14, 19, 23
Example of a hopping sequence in paging mode:
08, 57, 68, 70, 51, 02, 42, 40, 04, 61, 44, 46, 63, 14, 50, 48, 16, 65, 52, 54, 67, 18, 58, 56, 20, 53, 60, 62, 55, 06, 66, 64

10 Receiver input bandwidth and synchronization in hybrid mode:

The receiver input bandwidth is the same as in the data mode (1 MHz). When two Bluetooth devices establish contact for the first time, one device sends an inquiry access code and the other device is scanning for this inquiry access code. If two devices have been connected previously and want to start a new transmission, a similar procedure takes place. The only difference is, instead of the inquiry access code, a special access code, derived from the BD_ADDRESS of the paged device will be, will be sent by the master of this connection. Due to the fact that both units have been connected before (in the inquiry procedure) the paging unit has timing and frequency information about the page scan of the paged unit. For this reason the time to establish the connection is reduced.

11 Spread rate / data rate of the direct sequence signal

The Spread rate / Data rate in inquiry and paging mode can be defined via the access code. The access code is the only criterion for the system to check if there is a valid transmission or not. If you regard the presence of a valid access code as one bit of information, and compare it with the length of the access code of 68 bits, the Spread rate / Data rate will be 68/1.

12 Spurious emission in hybrid mode

The Dwell in hybrid mode is shorter than in data mode. For this reason the spurious emissions average level in data mode is worst case. The spurious emissions peak level is the same for both modes.