Test Report: 2W04622

Applicant: SMART TECHNOLOGIES INC.
3 Iber Road
Stittsville Ontario
K2S 1E6

Equipment Under Test: Smart Bluetooth Dongle

FCC ID:

In Accordance With: **FCC Part 15, Subpart C**
Frequency Hopping Spread Spectrum Transmitters
2400 - 2483.5 MHz

Tested By: Nemko Canada Inc.
303 River Road, R.R. 5
Ottawa, Ontario K1V 1H2

Authorized By:

J. Harrington, RF Group Manager

Date: 6 May 2002

Total Number of Pages: 54

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Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.247 for Frequency Hopping Spread Spectrum devices. Radiated tests were conducted is accordance with ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

TESTED BY: Glen Westwell, Wireless Technologist Date:30 April 2002

Summary Of Test Data

Name Of Test	Para. No.	Result
Powerline Conducted Emissions	15.207(a)	Complies
Channel Separation	15.247(a)(1)	Complies
Pseudorandom Hopping Algorithm	15.247(a)(1)	Complies
Time of Occupancy	15.247(a)(1)(ii)	Complies
20 dB Occupied Bandwidth	15.247(a)(1)	Complies
Peak Power Output	15.247(b)	Complies
Spurious Emissions (Radiated)	15.247(c)	Complies

Footnotes:

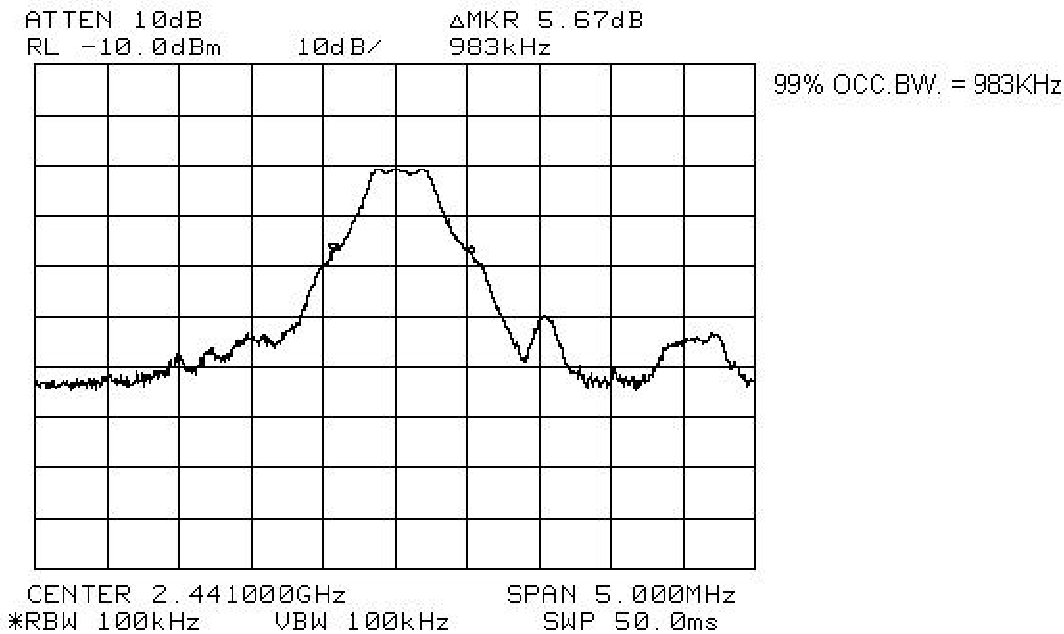
Test Conditions:

Indoor	Temperature:	22°C
	Humidity:	38%
Outdoor	Temperature:	10°C
	Humidity:	40%

Section 2. General Equipment Specification

Manufacturer:	Smart Technologies Inc.
Model No.:	Smart Bluetooth Dongle
Serial No.:	9152
Date Received In Laboratory:	26 March 2002
Nemko Identification No.:	#11

Frequency Range:	2402 – 2480MHz
Number of Channels:	79
Channel Spacing:	1MHz (typical)
Rated Output Power (into antenna):	-6 to +4dBm, (0dBm typical)
Antenna Gain:	2.15dBi
Emission Designator:	983KF1D


ATTEN 10dB
RL -10.0dBm
10dB/
ΔMKR 5.67dB
983kHz
99% OCC.BW. = 983KHz
CENTER 2.441000GHz
SPAN 5.000MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

Section 3. Powerline Conducted Emissions

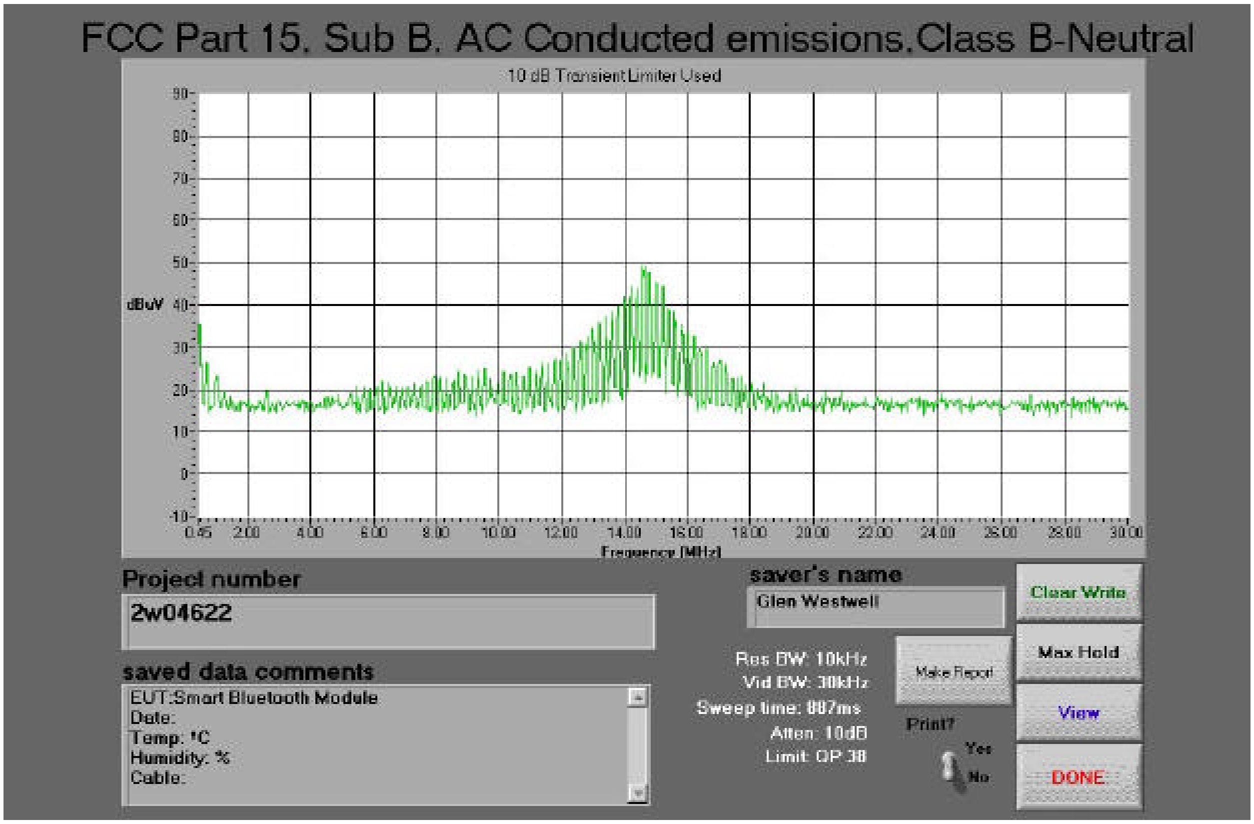
Para. No.: 15.207 (a)

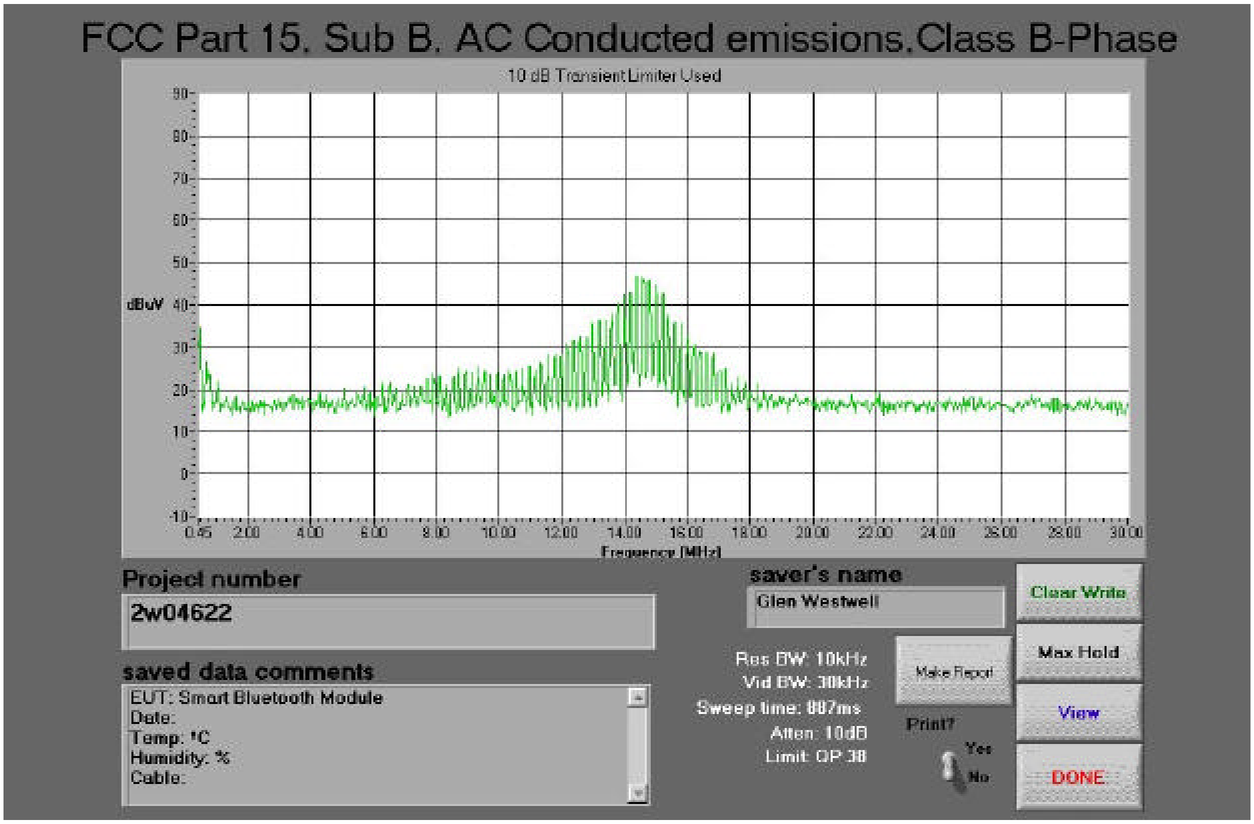
Test Performed By: Glen Westwell	**Date of Test: 26 Mar. 2002**

Test Results: Complies.

Measurement Data: See attached graph(s).

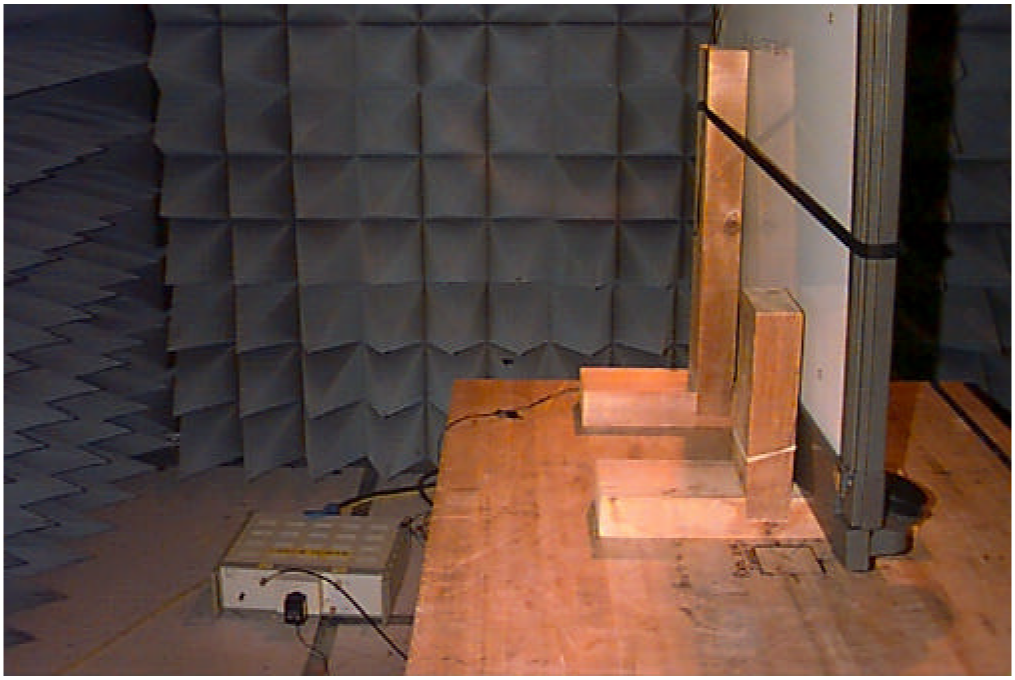
Conductor	Frequency (MHz)	CISPR (dBµV)	Average (dBµV)	BB/NB	BB Corr. (dB)	Result (dBµV)
Neutral	13.84	51.5	30.8	BB	-13	38.5
Neutral	14.57	54.4	40.3	BB	-13	41.4
Phase	13.57	51.3	37.8	BB	-13	38.3
Phase	14.18	51.6	39.9	BB	-13	38.6


FCC Part 15. Sub B. AC Conducted emissions.Class B-Neutral
10 dB Transient Limiter Used
dBuV
Frequency [MHz]
Project number
2w04622
saved data comments
EUT:Smart Bluetooth Module
Date:
Temp: °C
Humidity: %
Cable:
saver's name
Glen Westwell
Res BW: 10kHz
Vid BW: 30kHz
Sweep time: 887ms
Atten: 10dB
Limit: QP 38
Make Report
Print?
Yes
No
Clear Write
Max Hold
View
DONE


FCC Part 15. Sub B. AC Conducted emissions.Class B-Phase
10 dB Transient Limiter Used
dBuV
Frequency [MHz]
Project number
2w04622
saved data comments
EUT: Smart Bluetooth Module
Date:
Temp: °C
Humidity: %
Cable:
saver's name
Glen Westwell
Res BW: 10kHz
Vid BW: 30kHz
Sweep time: 887ms
Atten: 10dB
Limit: QP 38
Make Report
Print?
Yes
No
Clear Write
Max Hold
View
DONE

Front View

Side View



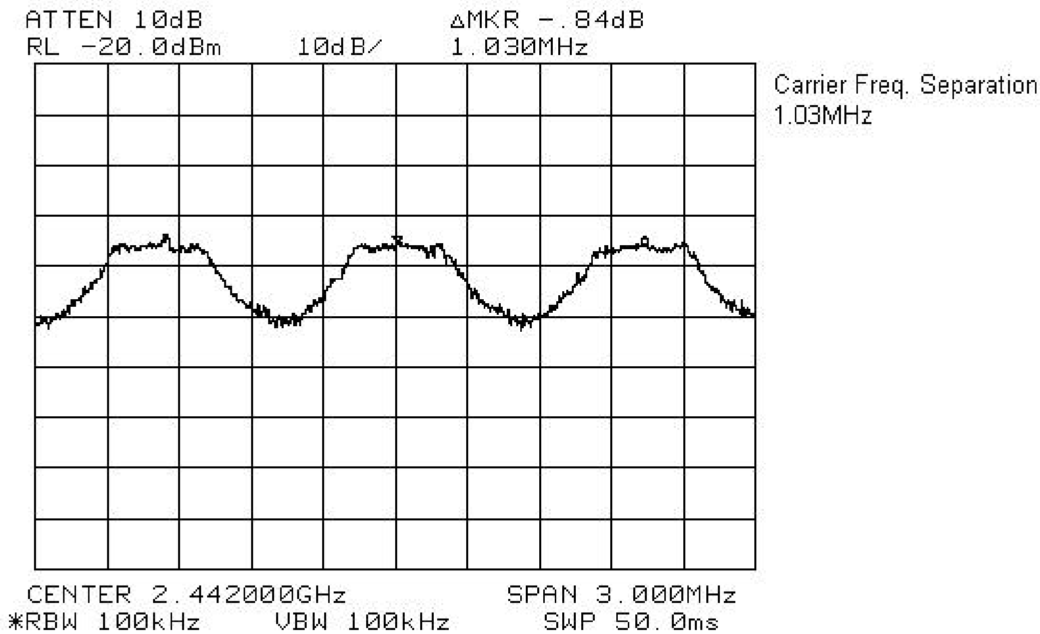
Section 4. Channel Separation

Para. No.: 15.247 (a)(1)

Test Performed By: Glen Westwell	**Date of Test: 26 Mar. 2002**

Test Results: Complies.

Measurement Data: Measured 20 dB bandwidth: 807KHz
Channel Separation: 1.03MHz


ATTEN 10dB
RL -20.0dBm
10dB/
ΔMKR -.84dB
1.030MHz
Carrier Freq. Separation
1.03MHz
CENTER 2.442000GHz
SPAN 3.000MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

Section 5. Pseudorandom Hopping Algorithm

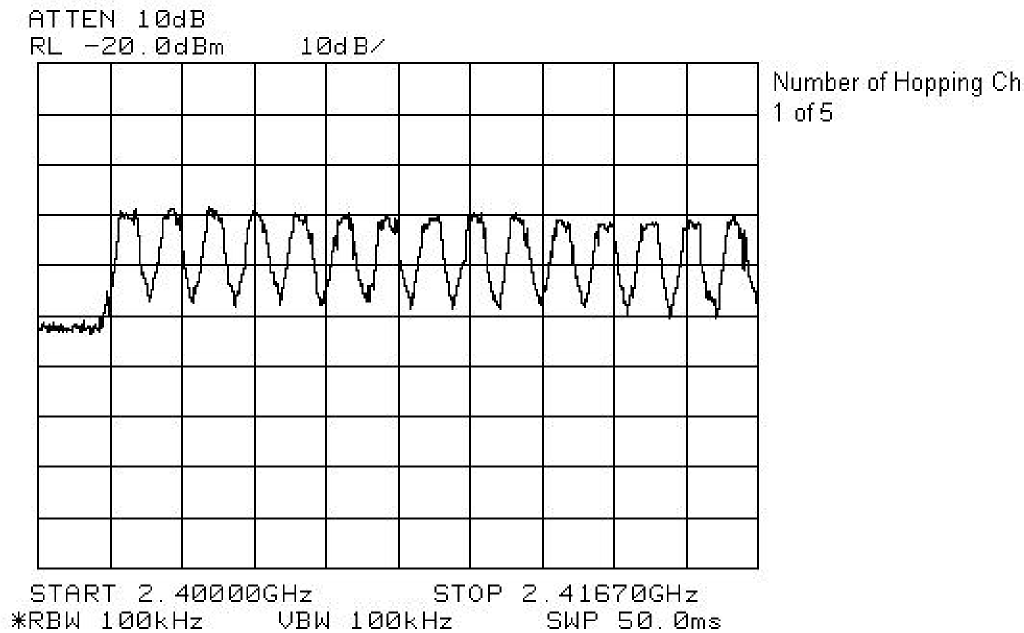
Para. No.: 15.247 (a)(1)

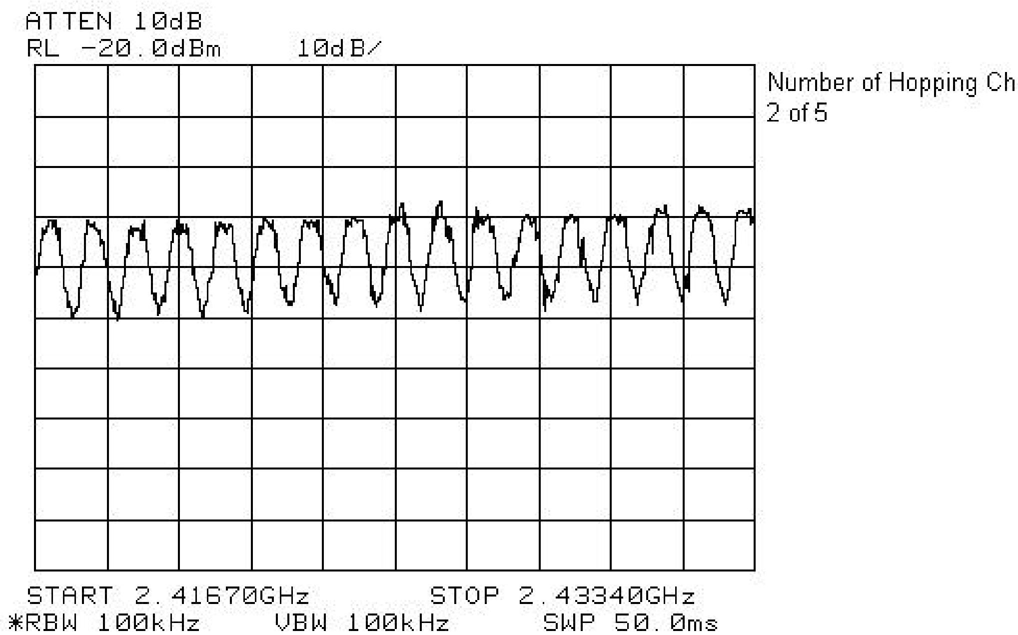
Test Performed By: Manufacturer Data	**Date of Test: 26 Mar. 2002**

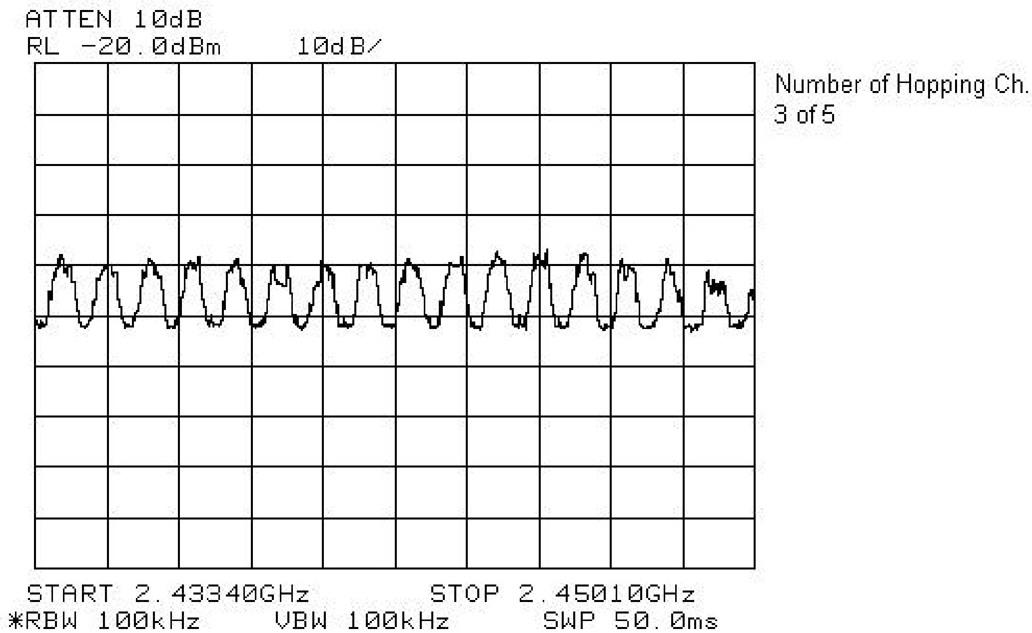
Test Results: Complies as per customer supplied data.

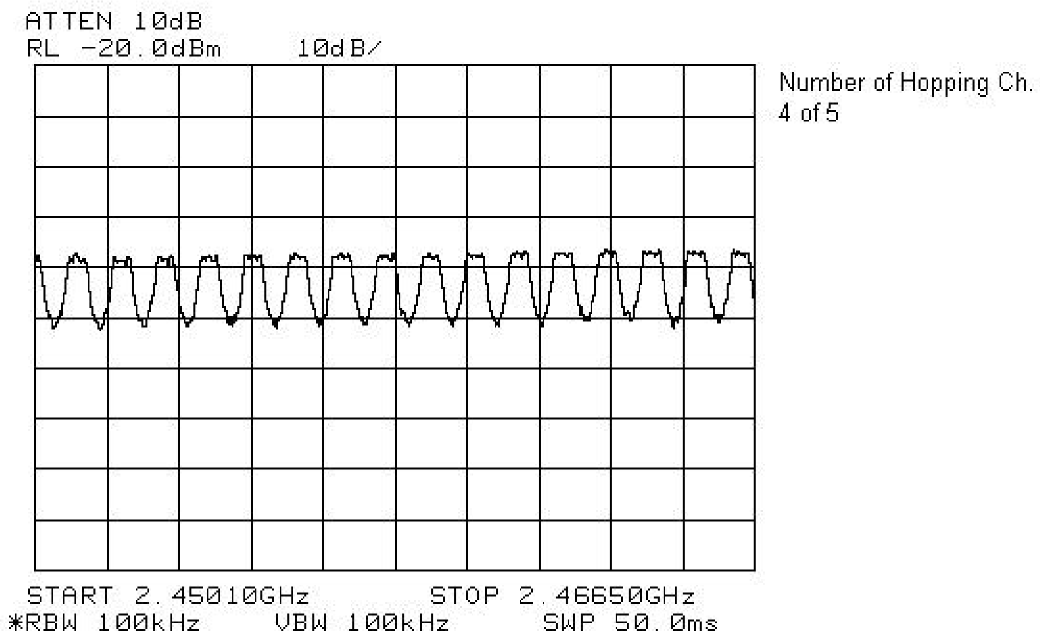
Measurement Data: Number of Hopping Frequencies: 79

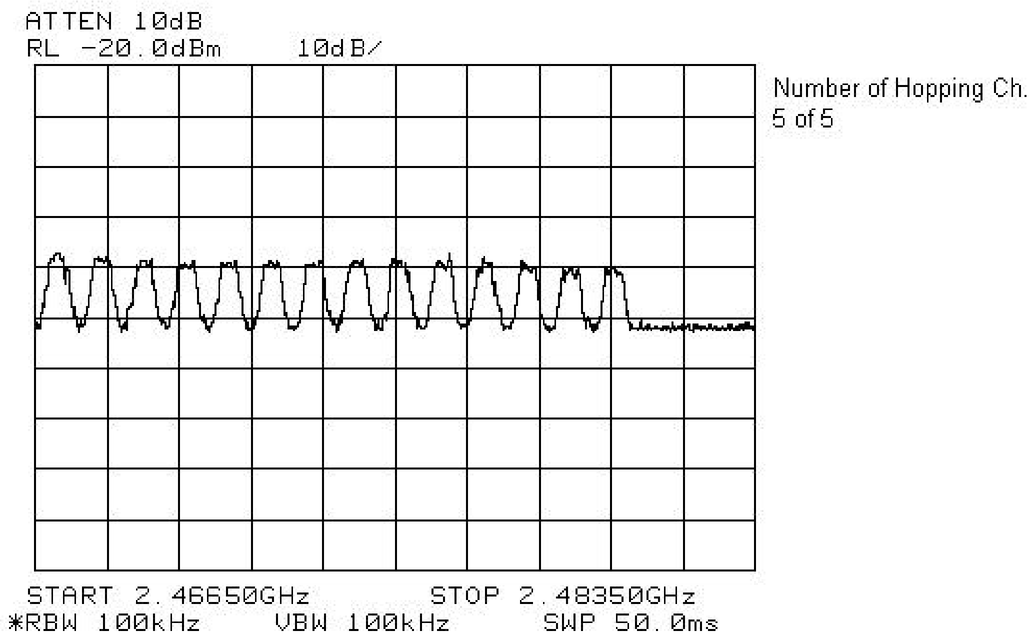
See attached customer supplied data.


ATTEN 10dB
RL -20.0dBm 10dB/
Number of Hopping Ch.
1 of 5
START 2.40000GHz STOP 2.41670GHz
*RBW 100kHz VBW 100kHz SWP 50.0ms


ATTEN 10dB
RL -20.0dBm 10dB/
Number of Hopping Ch.
2 of 5
START 2.41670GHz STOP 2.43340GHz
*RBW 100kHz VBW 100kHz SWP 50.0ms


ATTEN 10dB
RL -20.0dBm
10dB/
Number of Hopping Ch.
3 of 5
START 2.43340GHz
STOP 2.45010GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 10dB
RL -20.0dBm
10dB/
Number of Hopping Ch.
4 of 5
START 2.45010GHz
STOP 2.46650GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 10dB
RL -20.0dBm
10dB/
Number of Hopping Ch.
5 of 5
START 2.46650GHz
STOP 2.48350GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

Preliminary

(1/14)

	SPECIFICATION	APPROVED BY	CHECKED BY	WRITTEN BY
	WML-C06AU	7 Jun, 2001		

1. Scope

This specification covers Bluetooth module which complies with Bluetooth specification version 1.1 and integrates RF and baseband controller in ultra small package.

2. Dimensions

The dimension shall be in accordance with appearance drawing No. 64-7494

3. General Specification

No.	Items	Specifications
3-1	Supply Voltage	VDD: 3.3V+/-0.1V Regulated supply voltage
3-2	Current Consumption	80mA Typ.
3-3	Carrier Frequency	2400MHz to 2483.5MHz, See 3-17
3-4	Modulation Method	GFSK,1Mbps, 0.5BT Gaussian
3-5	Maximum Data Rate	Asynchronous:723.2kbps/57.6kbps Synchronous: 433.9kbps/433.9kbps
3-6	Transmission Power	0dBm Typ(Class 2)
3-7	Hopping	1600hops/sec, 1MHz channel space
3-8	Receiving Signal Range	-80 to -15dBm typ.
3-9	Receiver IF Frequency	1.5MHz center frequency
3-10	RF Input Impedance	50 ohms
3-11	Baseband Crystal OSC	16MHz
3-12	Output interface	USB, PCM/IF
3-13	Operating Temperature	-10 to +50 degree
3-14	Compliant	Bluetooth Specification Ver1.1

Absolute Maximum Rating

3-15	Absolute Max Supply Voltage	3.6V for VDD,other VDD +0.3V
3-16	Storage Temperature	-20 to +70 degree

Note1: The supply voltages for RF module which are described at 3-1 must have noise level less than 10mVp-p.

REVISION

3

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Preliminary

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3-17. Hopping Frequency

2400 to 2483.5MHz (ISM band, Japan)) F=2402+k MHz, k=0,.....,78

3-18. Guard Band

Items	Lower Guard Band	Upper Guard Band	Note
USA, Japan	2MHz	3.5MHz	
Europe(except Spain,France)	2MHz	3.5MHz	

3

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MEMORANDUM

Distribution: Peter Flittner, Robert Young, James Collier

cc:

Prepared By: Alex Busteed

Subject: Results of Processing Gain Tests for FCC Qualification

1 INTRODUCTION

This memo presents the results of the Processing Gain (PG) tests carried out for FCC qualification of the Cambridge Silicon Radio BC01B Bluetooth chip. The FCC states that the PG from a hybrid Bluetooth receiver must be greater than 17 dB when measured in accordance with the Continuous Wave (CW) jamming margin method. Testing of the BC01b has found the PG due to the DS section to be approximately 5 dB and the PG due to the FH part to be approximately 15 dB. It is therefore concluded that the BC01B complies with the FCC PG requirements for radio communication systems.

The rest of this paper outlines the PG measurement technique and discusses the test results. Appendix A contains a list of test equipment and Appendix B contains a printout of the measurement results.

2 METHOD

2.1 PG Definition

The Processing Gain from a frequency hopping communication system is derived from two parts, the FH section and the DS section. The PG due to FH is given by a simple equation and is constant. However measurement of the PG due to DS is a little more complex. One technique is to use the CW jamming margin method. This method measures PG due to DS using the following algorithm:

A CW signal generator is stepped in 50kHz increments across the passband of the system, recording at each point the generator level required to produce the 0.1% Packet Error Rate (PER). This is the jammer level. This level is then referenced to the output power of the intended Bluetooth signal and the Jammer to Signal Ratio JSR is thus calculated. The worst 4

JSR measurements are discarded and the worst remaining JSR is used to calculate the PG due to DS as follows:

$$G_p = SNR + JSR_{min} + L_{sys}$$

where G_p = the processing gain of the system, SNR = the signal to noise ratio required for 0.1% BER, JSR_{min} = minimum J/S ratio and L_{sys} = system losses.

2.2 PG Measurement Technique

Figure 1 provides an overview of the PG measurement technique. The measurement is performed in two parts, measurement of the system SNR and measurement of JSR_{min}.

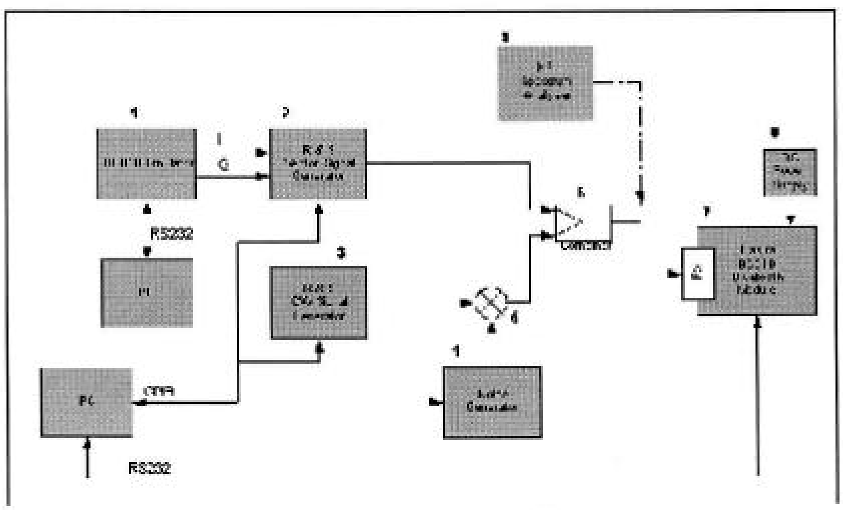

Figure 1: PG Measurement Technique

The system SNR is calculated using the following algorithm. Generate Bluetooth PRBS-9 packets using a BC01B emulator (1) and a Vector Signal Generator (2). Combine this signal with white noise of a constant level, which is generated using a noise source (4) and a CW Signal Generator (3). Then vary the level of the Bluetooth signal until the BER measured by the BC01B (7) is 0.1%. The resulting SNR is the signal level divided by the Noise level.

The JSR for a given jamming frequency is calculated using the following algorithm. Generate Bluetooth PRBS-9 packets using the BC01B emulator (1) and the Vector Signal Generator (2). Combine this signal with a constant CW tone at the jamming frequency using a CW Signal Generator (5) and a combiner (6). Then vary the level of the Bluetooth signal until the PER measured by the Casira Bluetooth Module (7) is 0.1%. The resulting JSR is the signal level divided by the jamming level.

3 RESULTS

3.1 Overview

The measurements found that the PG due to DS caused by the access code in page and inquiry mode is found to be approximately 5dB when the access code is a relatively random mixture of 1's and 0's. A random access code causes the most Inter Symbol Interference (ISI) and hence the worst PG for a hybrid system. Therefore only the results for this access code are used in the PG calculation.

The PG due to FH is given as

$$PG_{FH} = 10 \log_{10} (\text{number of frequency hops})$$

The number of hops in a Bluetooth system is 32, therefore the PG due to FH is approximately 15 dB. When this is added to the PG due to DS, the total PG for the BC01B is approximately 20 dB, above the minimum PG requirement for FCC qualification.

3.2 Detailed Results

Test Date:	17/11/00
Sample Time:	30 seconds
Access Code:	c6967e
Signal Frequency:	2.432GHz
Receiver Sensitivity:	-88.7 dBm
Jammer Signal Level:	-85.7 dBm
Measured SNR:	18.8dB
System Losses:	2dB

To calculate processing gain, ignore the worst 20% of data points and then apply the following formula:

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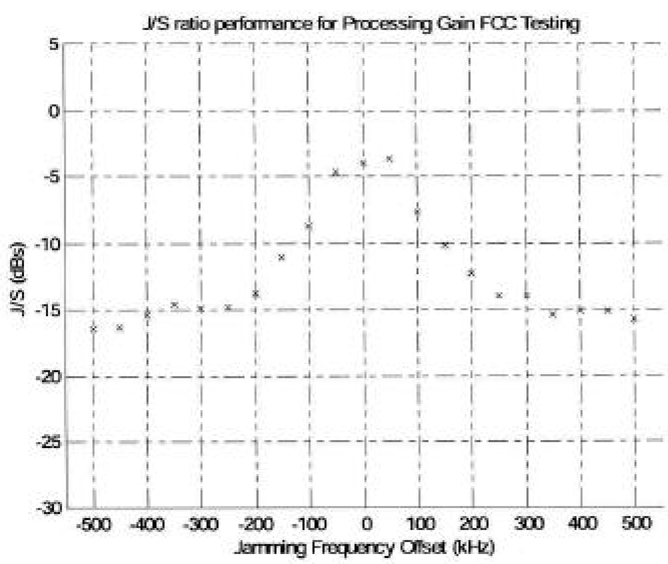
$$G_p = SNR + JSR_{min} + L_{sys}$$

Where
- G_p = Processing Gain of the module
- SNR = signal to noise ratio of the module
- JS_{min} = minimum J/S ratio after the worst 20% of J/S samples have been discarded
- L_{sys} = System losses

A total of 20 samples were taken by stepping the jamming signal frequency offsets in 50kHz increments over the bandwidth of the receiver. The worst 4 samples were found at –500kHz, -450kHz, -400kHz and 500kHz and were discarded. The remaining minimum J/S ratio was found to be -15.4dB at an offset of +350kHz

Thus, the processing gain due to direct sequence spreading in page and inquiry mode is

$$G_p = 18.8 - 15.4 + 2 = 5.4dB$$



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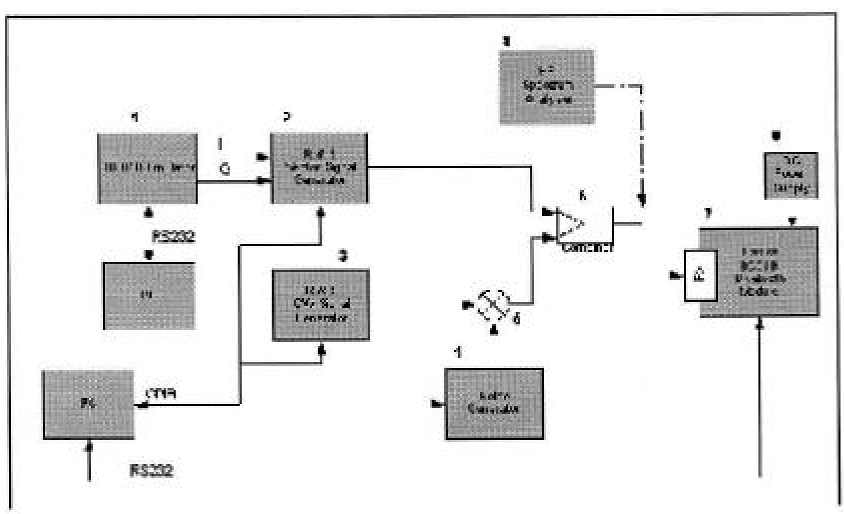
APPENDIX A - TEST EQUIPMENT LIST

Reference:	Instrument Type	Name
1	BlueCore Emulator Board	N/A
2	Vector Signal Generator	IFR2052
3	CW Signal Generator	IFR2025
4	White Noise Generator	HP33120A
5	RF Mixer	M8HC-7
6	RF Combiner	6 dB loss combiner
7	Bluetooth Motherboard and BC01B Module	Casira Development Kit
8	5V, 4A DC Power Supply	N/A
9	Spectrum Analyser	HP E4405B



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APPENDIX B - TEST RESULTS

Timestamp: 14:42.43, 16/11/2000
Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -500 kHz

Level = -68.7 dBm BER = 0.03% PER = 0.01% SER1 = 0.01% SER2 = 0.01%
Level = -70.7 dBm BER = 0.32% PER = 0.79% SER1 = 0.79% SER2 = 0.79%
Level = -69.7 dBm BER = 0.11% PER = 0.18% SER1 = 0.18% SER2 = 0.18%
Level = -68.7 dBm BER = 0.04% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -69.2 dBm BER = 0.06% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -69.7 dBm BER = 0.11% PER = 0.16% SER1 = 0.16% SER2 = 0.16%
Level = -69.5 dBm BER = 0.09% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -69.3 dBm BER = 0.07% PER = 0.05% SER1 = 0.06% SER2 = 0.06%

J/S = -16.50 dB (SER = 0.06%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -450 kHz

Level = -69.2 dBm BER = 0.06% PER = 0.05% SER1 = 0.06% SER2 = 0.05%
Level = -71.2 dBm BER = 0.84% PER = 1.72% SER1 = 1.69% SER2 = 1.69%
Level = -70.2 dBm BER = 0.26% PER = 0.40% SER1 = 0.40% SER2 = 0.40%
Level = -69.2 dBm BER = 0.07% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -69.7 dBm BER = 0.12% PER = 0.18% SER1 = 0.18% SER2 = 0.18%
Level = -69.5 dBm BER = 0.09% PER = 0.14% SER1 = 0.14% SER2 = 0.14%
Level = -69.3 dBm BER = 0.07% PER = 0.08% SER1 = 0.08% SER2 = 0.08%

J/S = -16.40 dB (SER = 0.08%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -400 kHz

Level = -69.3 dBm BER = 0.04% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -71.3 dBm BER = 0.44% PER = 0.72% SER1 = 0.71% SER2 = 0.71%
Level = -70.3 dBm BER = 0.13% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -69.3 dBm BER = 0.04% PER = 0.01% SER1 = 0.01% SER2 = 0.01%
Level = -69.8 dBm BER = 0.08% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -70.3 dBm BER = 0.13% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -15.40 dB (SER = 0.10%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -350 kHz

Level = -70.3 dBm BER = 0.05% PER = 0.01% SER1 = 0.01% SER2 = 0.01%
Level = -72.3 dBm BER = 0.88% PER = 1.67% SER1 = 1.64% SER2 = 1.64%
Level = -71.3 dBm BER = 0.19% PER = 0.10% SER1 = 0.10% SER2 = 0.10%
Level = -70.3 dBm BER = 0.06% PER = 0.01% SER1 = 0.01% SER2 = 0.01%
Level = -70.8 dBm BER = 0.09% PER = 0.04% SER1 = 0.04% SER2 = 0.04%
Level = -71.3 dBm BER = 0.17% PER = 0.12% SER1 = 0.12% SER2 = 0.12%

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Level = -71.1 dBm BER = 0.13% PER = 0.05% SER1 = 0.05% SER2 = 0.05%

J/S = -14.60 dB (SER = 0.05%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -300 kHz

Level = -71.1 dBm BER = 0.03% PER = 0.15% SER1 = 0.15% SER2 = 0.15%
Level = -69.1 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -70.1 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -71.1 dBm BER = 0.03% PER = 0.19% SER1 = 0.19% SER2 = 0.19%
Level = -70.6 dBm BER = 0.02% PER = 0.04% SER1 = 0.04% SER2 = 0.04%
Level = -70.8 dBm BER = 0.02% PER = 0.09% SER1 = 0.09% SER2 = 0.09%

J/S = -14.90 dB (SER = 0.09%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -250 kHz

Level = -70.8 dBm BER = 0.00% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -72.8 dBm BER = 0.05% PER = 2.34% SER1 = 2.29% SER2 = 2.29%
Level = -71.8 dBm BER = 0.01% PER = 0.33% SER1 = 0.33% SER2 = 0.33%
Level = -70.8 dBm BER = 0.00% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
Level = -71.3 dBm BER = 0.01% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -71.1 dBm BER = 0.00% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -70.9 dBm BER = 0.00% PER = 0.03% SER1 = 0.03% SER2 = 0.03%

J/S = -14.80 dB (SER = 0.03%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -200 kHz

Level = -70.9 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -72.9 dBm BER = 0.00% PER = 0.34% SER1 = 0.34% SER2 = 0.34%
Level = -71.9 dBm BER = 0.00% PER = 0.07% SER1 = 0.07% SER2 = 0.07%
Level = -72.4 dBm BER = 0.00% PER = 0.15% SER1 = 0.15% SER2 = 0.15%
Level = -72.2 dBm BER = 0.00% PER = 0.12% SER1 = 0.12% SER2 = 0.12%
Level = -72.0 dBm BER = 0.00% PER = 0.05% SER1 = 0.05% SER2 = 0.05%

J/S = -13.80 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -150 kHz

Level = -71.9 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -73.9 dBm BER = 0.00% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -75.9 dBm BER = 0.01% PER = 0.83% SER1 = 0.82% SER2 = 0.82%
Level = -74.9 dBm BER = 0.00% PER = 0.16% SER1 = 0.16% SER2 = 0.16%
Level = -73.9 dBm BER = 0.00% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -74.4 dBm BER = 0.00% PER = 0.08% SER1 = 0.07% SER2 = 0.07%
Level = -74.9 dBm BER = 0.00% PER = 0.18% SER1 = 0.18% SER2 = 0.18%

Level = -74.7 dBm BER = 0.00% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -11.00 dB (SER = 0.10%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -100 kHz

Level = -74.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -76.7 dBm BER = 0.00% PER = 0.05% SER1 = 0.06% SER2 = 0.05%
Level = -78.7 dBm BER = 0.01% PER = 2.05% SER1 = 2.01% SER2 = 2.01%
Level = -77.7 dBm BER = 0.00% PER = 0.30% SER1 = 0.30% SER2 = 0.30%
Level = -76.7 dBm BER = 0.00% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -77.2 dBm BER = 0.00% PER = 0.13% SER1 = 0.12% SER2 = 0.12%
Level = -77.0 dBm BER = 0.00% PER = 0.08% SER1 = 0.07% SER2 = 0.07%

J/S = -8.70 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -50 kHz

Level = -77.0 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -79.0 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -81.0 dBm BER = 0.01% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -83.0 dBm BER = 0.16% PER = 0.73% SER1 = 0.72% SER2 = 0.72%
Level = -82.0 dBm BER = 0.03% PER = 0.26% SER1 = 0.26% SER2 = 0.26%
Level = -81.0 dBm BER = 0.01% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -81.5 dBm BER = 0.02% PER = 0.13% SER1 = 0.13% SER2 = 0.13%
Level = -81.3 dBm BER = 0.02% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -81.1 dBm BER = 0.04% PER = 0.06% SER1 = 0.06% SER2 = 0.06%

J/S = -4.60 dB (SER = 0.06%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +0 kHz

Level = -68.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -70.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -72.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -74.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -76.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -78.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -80.7 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -82.7 dBm BER = 0.04% PER = 0.04% SER1 = 0.03% SER2 = 0.03%
Level = -84.7 dBm BER = 7.51% PER = 48.26% SER1 = 27.11% SER2 = 28.05%
Level = -83.7 dBm BER = 0.31% PER = 1.01% SER1 = 0.86% SER2 = 0.86%
Level = -82.7 dBm BER = 0.05% PER = 0.24% SER1 = 0.18% SER2 = 0.18%
Level = -81.7 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -82.2 dBm BER = 0.02% PER = 0.13% SER1 = 0.10% SER2 = 0.10%
Level = -82.0 dBm BER = 0.02% PER = 2.31% SER1 = 2.24% SER2 = 2.24%
Level = -81.8 dBm BER = 0.02% PER = 0.06% SER1 = 0.05% SER2 = 0.05%

J/S = -3.90 dB (SER = 0.05%)

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Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +50 kHz

Level = -81.8 dBm BER = 0.11% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -83.8 dBm BER = 0.68% PER = 2.16% SER1 = 1.82% SER2 = 1.82%
Level = -82.8 dBm BER = 0.28% PER = 0.35% SER1 = 0.29% SER2 = 0.29%
Level = -81.8 dBm BER = 0.09% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -82.3 dBm BER = 0.15% PER = 0.25% SER1 = 0.22% SER2 = 0.22%
Level = -82.1 dBm BER = 0.12% PER = 0.09% SER1 = 0.07% SER2 = 0.07%

J/S = -3.60 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +100 kHz

Level = -82.1 dBm BER = 1.55% PER = 15.88% SER1 = 13.44% SER2 = 13.51%
Level = -80.1 dBm BER = 0.28% PER = 5.78% SER1 = 5.47% SER2 = 5.47%
Level = -78.1 dBm BER = 0.03% PER = 0.09% SER1 = 0.09% SER2 = 0.09%

J/S = -7.60 dB (SER = 0.09%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +150 kHz

Level = -78.1 dBm BER = 0.41% PER = 13.58% SER1 = 11.96% SER2 = 12.16%
Level = -76.1 dBm BER = 0.09% PER = 0.42% SER1 = 0.42% SER2 = 0.42%
Level = -74.1 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -75.1 dBm BER = 0.01% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -76.1 dBm BER = 0.04% PER = 0.41% SER1 = 0.41% SER2 = 0.41%
Level = -75.6 dBm BER = 0.03% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -10.10 dB (SER = 0.10%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +200 kHz

Level = -75.6 dBm BER = 0.26% PER = 7.53% SER1 = 7.00% SER2 = 7.00%
Level = -73.6 dBm BER = 0.02% PER = 0.17% SER1 = 0.17% SER2 = 0.17%
Level = -71.6 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -72.6 dBm BER = 0.00% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
Level = -73.6 dBm BER = 0.02% PER = 0.14% SER1 = 0.14% SER2 = 0.14%
Level = -73.1 dBm BER = 0.01% PER = 0.04% SER1 = 0.04% SER2 = 0.04%
Level = -73.3 dBm BER = 0.01% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -73.5 dBm BER = 0.03% PER = 0.09% SER1 = 0.09% SER2 = 0.09%

J/S = -12.20 dB (SER = 0.09%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +250 kHz

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Level = -73.5 dBm BER = 0.25% PER = 3.58% SER1 = 3.46% SER2 = 3.46%
Level = -71.5 dBm BER = 0.01% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
Level = -72.5 dBm BER = 0.06% PER = 0.57% SER1 = 0.57% SER2 = 0.57%
Level = -72.0 dBm BER = 0.02% PER = 0.12% SER1 = 0.12% SER2 = 0.12%
Level = -71.5 dBm BER = 0.01% PER = 0.04% SER1 = 0.04% SER2 = 0.04%
Level = -71.7 dBm BER = 0.01% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -71.9 dBm BER = 0.02% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -14.00 dB (SER = 0.05%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +300 kHz

Level = -71.7 dBm BER = 0.08% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -14.00 dB (SER = 0.10%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +350 kHz

Level = -71.7 dBm BER = 0.25% PER = 1.43% SER1 = 1.41% SER2 = 1.41%
Level = -69.7 dBm BER = 0.02% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -70.7 dBm BER = 0.08% PER = 0.14% SER1 = 0.14% SER2 = 0.14%
Level = -70.2 dBm BER = 0.03% PER = 0.74% SER1 = 0.74% SER2 = 0.74%
Level = -69.7 dBm BER = 0.02% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -69.9 dBm BER = 0.02% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -70.1 dBm BER = 0.03% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
Level = -70.3 dBm BER = 0.03% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -70.5 dBm BER = 0.06% PER = 0.13% SER1 = 0.13% SER2 = 0.13%

J/S = -15.40 dB (SER = 0.06%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +400 kHz

Level = -70.3 dBm BER = 0.07% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -72.3 dBm BER = 1.28% PER = 4.62% SER1 = 4.42% SER2 = 4.42%
Level = -71.3 dBm BER = 0.24% PER = 0.48% SER1 = 0.47% SER2 = 0.47%
Level = -70.3 dBm BER = 0.06% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -70.8 dBm BER = 0.12% PER = 0.15% SER1 = 0.15% SER2 = 0.15%
Level = -70.6 dBm BER = 0.11% PER = 0.08% SER1 = 0.08% SER2 = 0.08%

J/S = -15.10 dB (SER = 0.08%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +450 kHz

Level = -70.6 dBm BER = 0.17% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -68.6 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -69.6 dBm BER = 0.04% PER = 0.00% SER1 = 0.00% SER2 = 0.00%

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Level = -70.6 dBm BER = 0.17% PER = 0.08% SER1 = 0.07% SER2 = 0.07%
Level = -71.6 dBm BER = 0.60% PER = 0.70% SER1 = 0.69% SER2 = 0.69%
Level = -71.1 dBm BER = 0.31% PER = 0.30% SER1 = 0.29% SER2 = 0.29%
Level = -70.6 dBm BER = 0.19% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -70.1 dBm BER = 0.09% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -70.3 dBm BER = 0.10% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -70.5 dBm BER = 0.16% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -70.7 dBm BER = 0.20% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -70.9 dBm BER = 0.26% PER = 0.15% SER1 = 0.15% SER2 = 0.15%

J/S = -15.10 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +500 kHz

Level = -68.7 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -70.7 dBm BER = 0.12% PER = 0.19% SER1 = 0.19% SER2 = 0.19%
Level = -69.7 dBm BER = 0.03% PER = 0.01% SER1 = 0.01% SER2 = 0.01%
Level = -70.2 dBm BER = 0.07% PER = 0.12% SER1 = 0.12% SER2 = 0.12%
Level = -70.0 dBm BER = 0.04% PER = 0.06% SER1 = 0.06% SER2 = 0.06%

J/S = -15.70 dB (SER = 0.06%)