



**PCTEST ENGINEERING
LABORATORY, INC.**

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FCC H - Block Testing

Requested By:

CTIA – The Wireless Association
1400 16th Street NW
Suite 600
Washington, D.C. 20036

Date of Testing:

November 1-19, 2004

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Test Report Serial No.:

H-241019614-R3.CTIA

FCC Rule Part(s):

§ 24; ET Docket No 00-258

Test Plan:

CTIA Test Plan for the Feasibility of a PCS H Block
Revision 9, Oct. 2004

EUT Type(s):

2 - CDMA Phones, 2 - GSM Phones

Tx Frequency:

1850.0 MHz – 1910.0 MHz (PCS)
1915.0 MHz – 1920.0 MHz (H-Block) (Proposed)

Rx Frequency Range:

1930.0 MHz – 1990.0 MHz (PCS)
1995.0 MHz – 2000.0 MHz (H-Block) (Proposed)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Alfred Cirwithian
Vice President Engineering



PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 1 of 94

TABLE OF CONTENTS

1.	INTRODUCTION	3
2.	TEST SITE LOCATION	4
3.	SCOPE OF TESTS	5
3.1	RECEIVER OVERLOAD AND IMD TEST.....	5
3.2	DESENSITIZATION FROM AWGN TEST.....	5
3.3	OUT-OF-BAND EMISSIONS TEST.....	5
4.	RECEIVER OVERLOAD AND IMD TEST RESULTS.....	7
4.1	RECEIVER OVERLOAD TESTS – CDMA.....	7-17
4.2	INTERMODULATION (IMD) TESTS – CDMA.....	18-22
4.3	RECEIVER OVERLOAD TESTS – GSM.....	23-33
5.	DESENSITIZATION FROM AWGN TEST RESULTS.....	34
5.1	AWGN TESTS – CDMA.....	34-35
5.2	AWGN TESTS – GSM.....	36-37
6.	OUT-OF-BAND EMISSIONS (OOBE) TEST RESULTS.....	38
6.1	TRANSMITTER SPURIOUS EMISSIONS TESTS.....	38-40
APPENDIX: A FILTER RESPONSES		41-43
APPENDIX: B TEST DATA.....		44-94

PCTEST™ REPORT	 <small>Complete Wireless Lab</small>	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 2 of 94

1. INTRODUCTION

This document presents test data regarding mobile-to-mobile interference related to the proposed H-Block, and its location within the existing transmit-receive frequency duplex separation of the PCS band. Measurements were performed in accordance with the Test Plan provided by the Cellular Telecommunications & Internet Association (CTIA).

SAMPLE	TECHNOLOGY	MEASURED RECEIVE SENSITIVITY
A	CDMA	- 108.84 dBm
B	CDMA	- 108.42 dBm
C	GSM	- 111.20 dBm
D	GSM	- 112.70 dBm

Table 1. Measured Receive Sensitivity

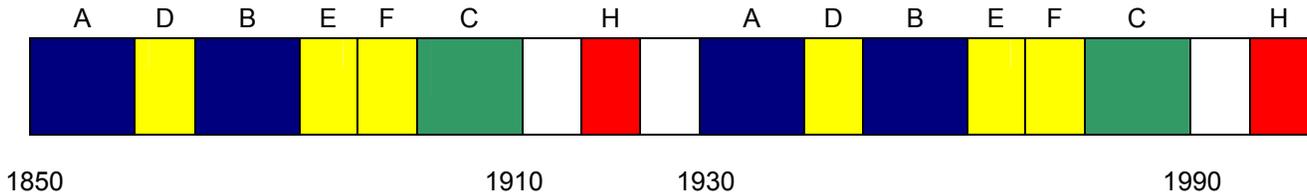


Figure 1. PCS Band Mobile TX / RX Frequency Blocks (not to scale)

PCTEST™ REPORT	 PCTEST™ Complete Wireless Lab® www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 3 of 94

2. TEST SITE LOCATION

The map at the right shows the location of the PCTEST LABORATORY in Columbia, Maryland. It is in proximity to the FCC Laboratory, the Baltimore-Washington International (BWI) airport, the city of Baltimore and Washington, DC (See Figure 2).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49' 38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on October 19, 2002.

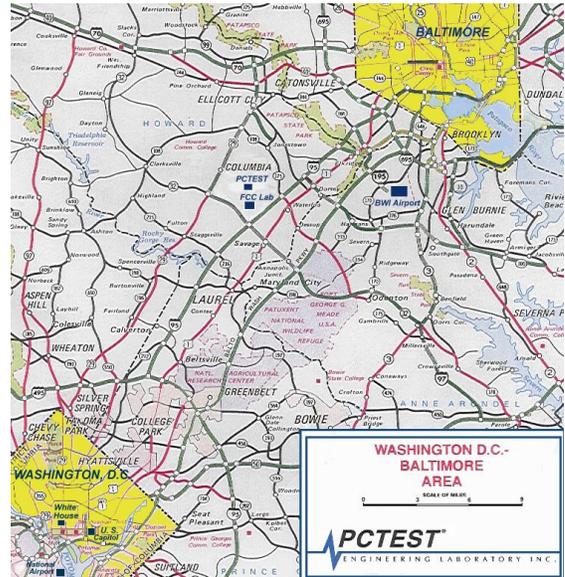
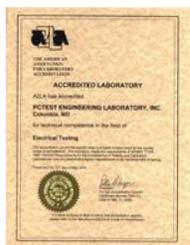


Figure 2.
Map of the Greater Baltimore and Metropolitan Washington, D.C. area

2.1 PCTEST Facility Accreditation/Recognition:

Measurements were performed at an independent accredited PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.

- PCTEST’s facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (IC 2451).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE Directives (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules.
- PCTEST facility is an IC registered (IC-2451) test laboratory with the site description on file at Industry Canada and an IC Foreign Certification Body (FCB).
- PCTEST is a CTIA Authorized Test Laboratory (CATL) in AMPS and CDMA mobile phones.



PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 4 of 94

3. SCOPE OF TESTS

3.1 Receiver Overload and IMD Test

The threshold and extent of susceptibility of the sample mobile phones receiving a PCS band signal to a strong signal from a nearby mobile phone transmitting at high power at the high end of the H block, as reflected in the increase of FER/BER above baseline levels (FER for CDMA mobile phones, BER for GSM mobile phones), corresponding to a gradually increasing H-Block interferer, was measured. The GSM mobile phones were tested while operating in a single-slot (voice only) mode. The baseline FER/BER levels were established through the insertion of additive white Gaussian noise (AWGN). Tests were performed with the victim mobile phones operating at two receive power levels: -100 dBm and -105 dBm (CDMA victims), and -97 dBm and -102 dBm (GSM victims). Both CDMA and GSM interferer modulation types were employed. In the GSM interferer/GSM victim configuration, the effect of varying the time slot used by the EUT was investigated, and found to have no significant impact on the results.

In addition, tests were performed to measure the extent that a mobile phone transmitting in the upper portion of the C-Block (e. g. 1908.75 MHz, under similar signal conditions) overloads a victim mobile phone operating in the existing PCS blocks.

Also, tests were performed to measure the effect of H-Block 2f1-f2 inter-modulation (IMD) on a B-Block victim channel: CDMA mobile phone receiving on PCS channel 575 (1958.75 MHz), and transmitting at 1878.75 MHz, with an H-Block mobile transmitting at 1918.75 MHz, ($2 * 1918.75 - 1878.75 = 1958.75$). Measurements of FER/BER were performed with the level of the B-Block transmission held constant, while the level of the H-Block interferer was gradually increased.

3.2 Desensitization from AWGN Test

The increase of BER/FER above baseline levels of the victim mobile phones, with respect to increasing levels of additive white Gaussian noise (AWGN) interference in the victim receive band, was measured. Tests were performed with the victim mobile phones operating at two receive power levels: -100 dBm and -105 dBm (CDMA victims), and -97 dBm and -102 dBm (GSM victims).

3.3 Out-of-Band Emissions Test

The OOB E of the sample PCS mobile phones (in dBm/MHz) falling within the lower mobile receive channels (e.g., CDMA channel 25 = 1931.25 MHz, GSM1900 ARFCN 515=1930.8 MHz) were measured, while the phones were transmitting on a call on various channels in the standard PCS bands (A-F blocks).

PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 5 of 94

3. SCOPE OF TESTS (Continued)

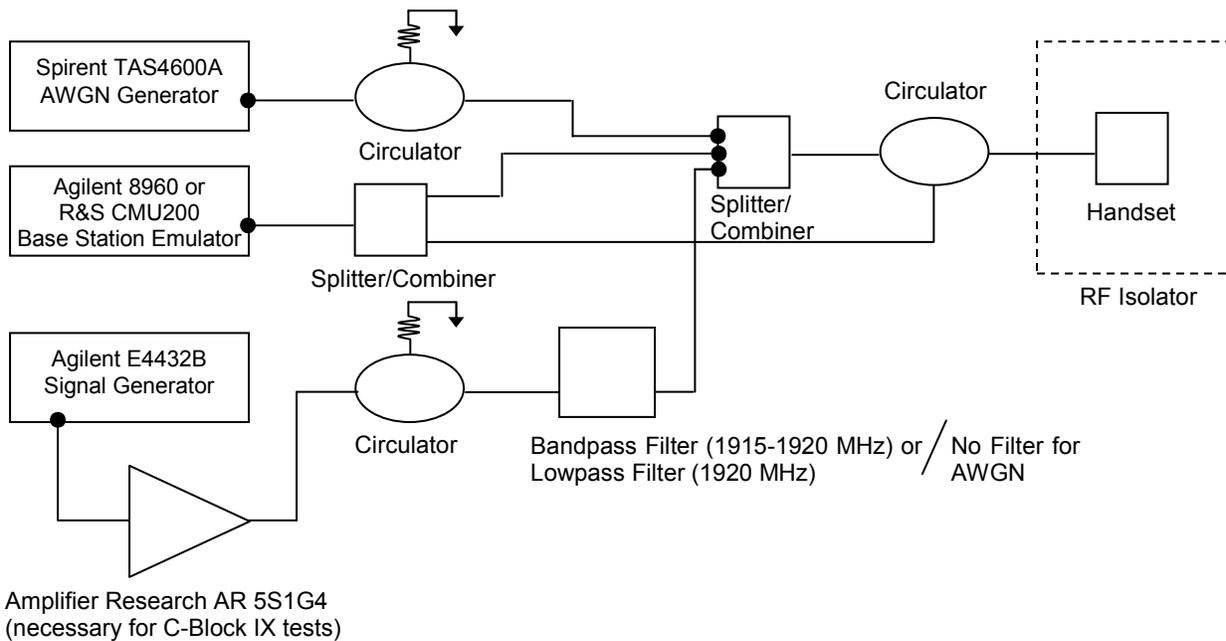
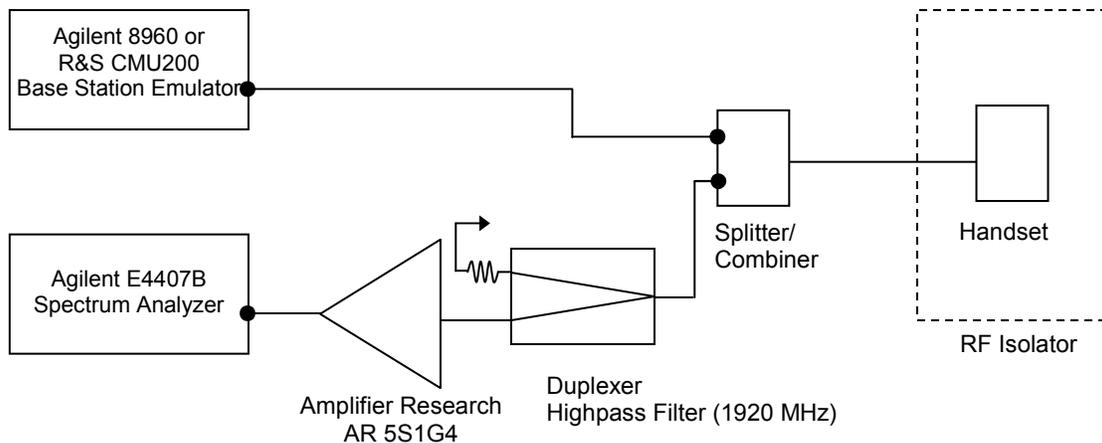


Figure 3. Receiver Overload & IMD Test
AWGN Desensitization Test Configuration #1



Notes:

1. RBW = 1 MHz
2. VBW = Sweep = Auto
3. RMS Average Detector
4. Noise Floor in 1930-1940 MHz Band = - 92.5 dBm/MHz
5. Channel Power Measurement (dBm/MHz)

Figure 4. Out-of Band Emissions Test Setup

PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 6 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS

4.1 Receiver Overload Tests - CDMA

Victim/Block	Interferer/Type	RX level (dBm)
CDMA Channel 25/A	1918.75/CDMA	-100
CDMA Channel 25/A	1918.75/CDMA	-105
CDMA Channel 25/A	1919.8/GSM	-100
CDMA Channel 25/A	1919.8/GSM	-105
CDMA Channel 25/A	1917.5/CDMA	-100
CDMA Channel 25/A	1917.5/CDMA	-105
CDMA Channel 450/B	1918.75/CDMA	-100
CDMA Channel 450/B	1918.75/CDMA	-105
CDMA Channel 25/A	CDMA Channel 1175 C Block	-100
CDMA Channel 25/A	CDMA Channel 1175 C Block	-105

Table 2. Receiver Overload Test Setup - CDMA

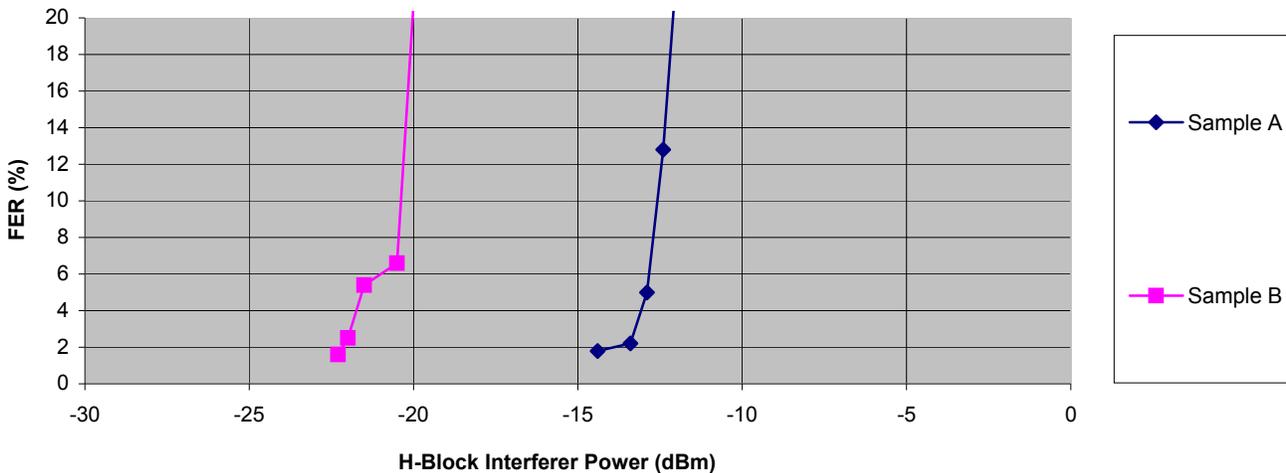
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Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 7 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.1 Receiver Overload Test Results - CDMA

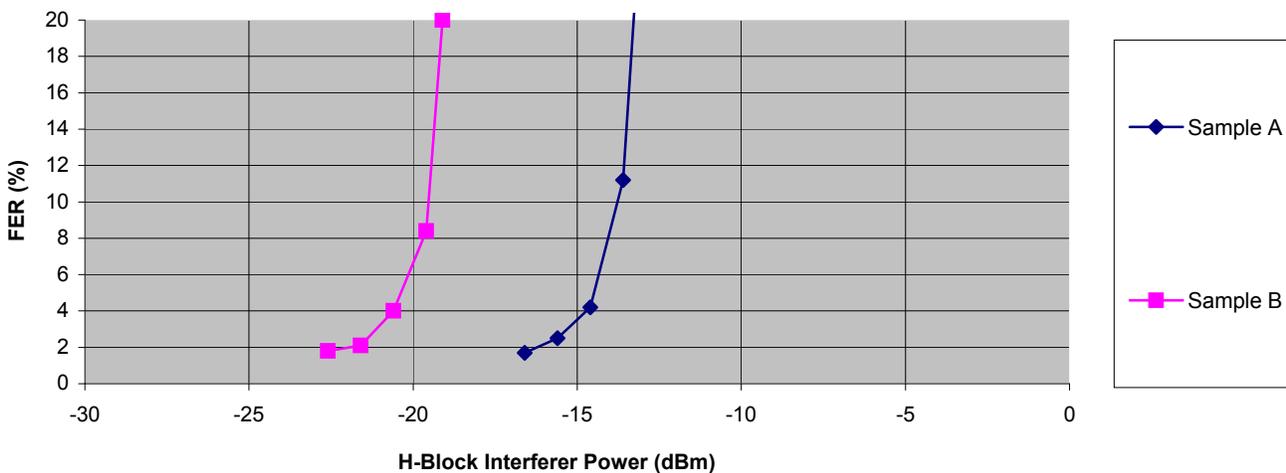
FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 40° C)



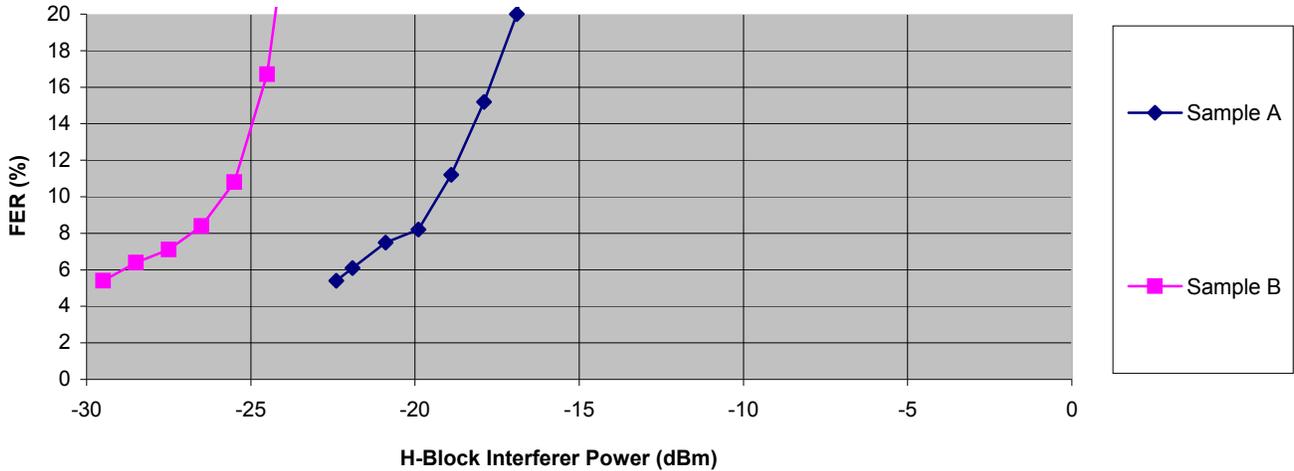
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 8 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.2 Receiver Overload Test Results - CDMA

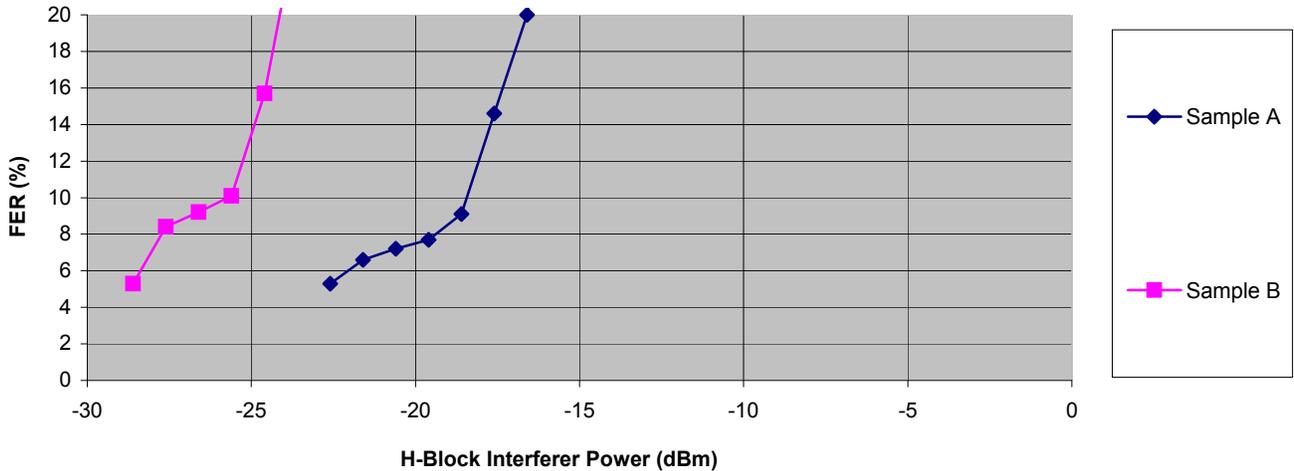
FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
(Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
(Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 40° C)



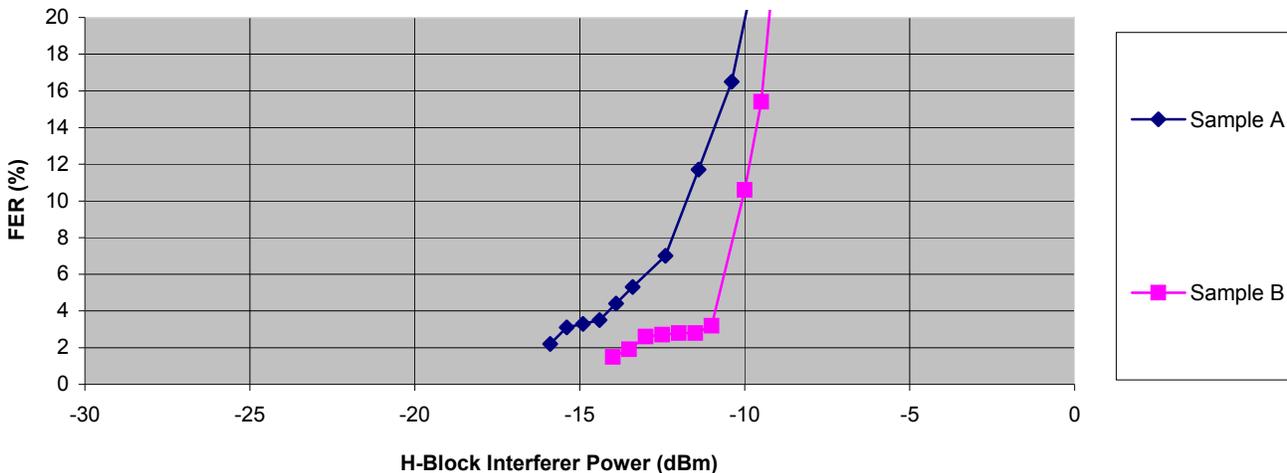
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 9 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.3 Receiver Overload Test Results - CDMA

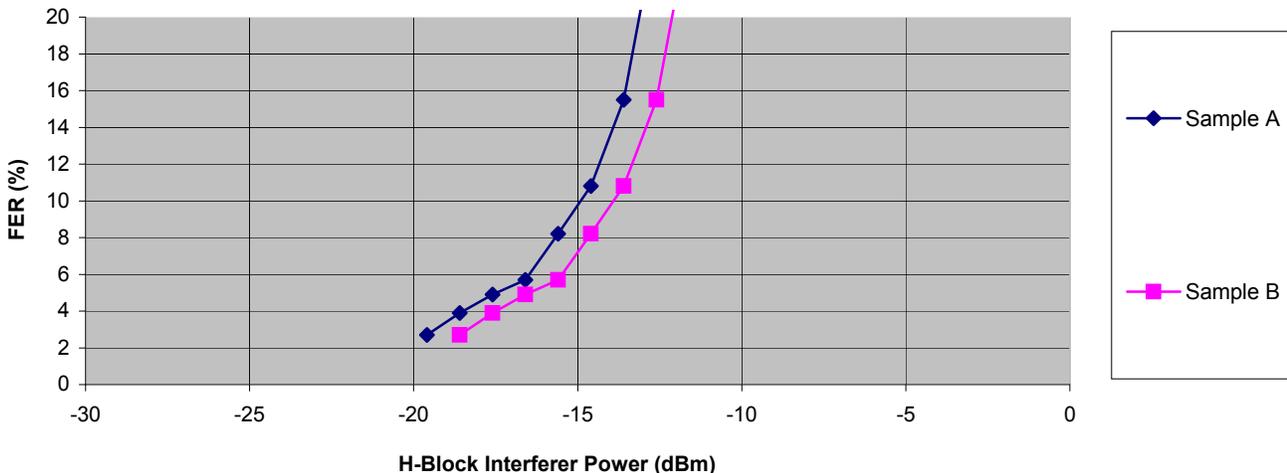
FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block GSM Interferer @ 1919.8 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block GSM Interferer @ 1919.8 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 40° C)



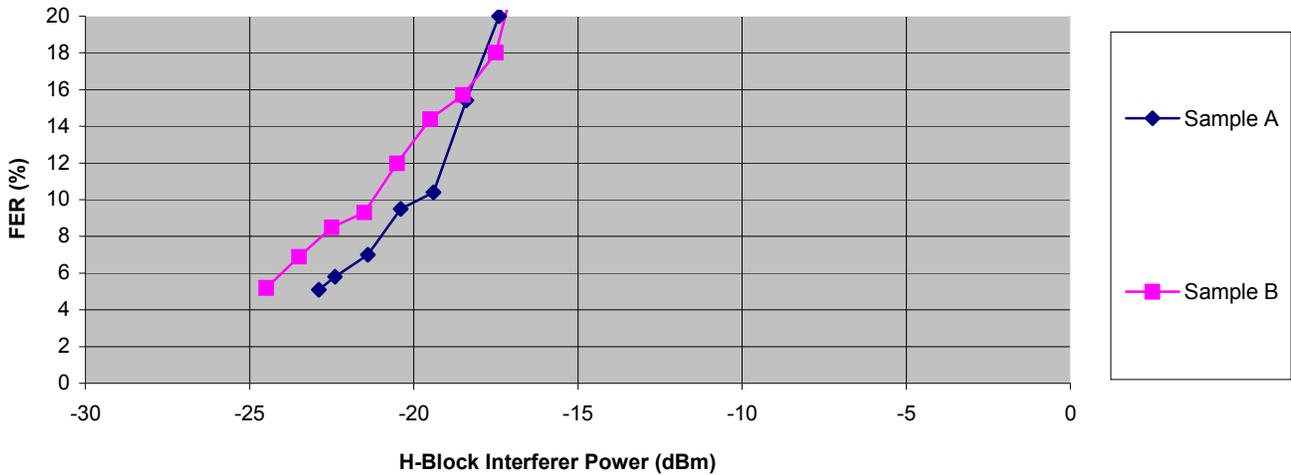
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 10 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.4 Receiver Overload Test Results - CDMA

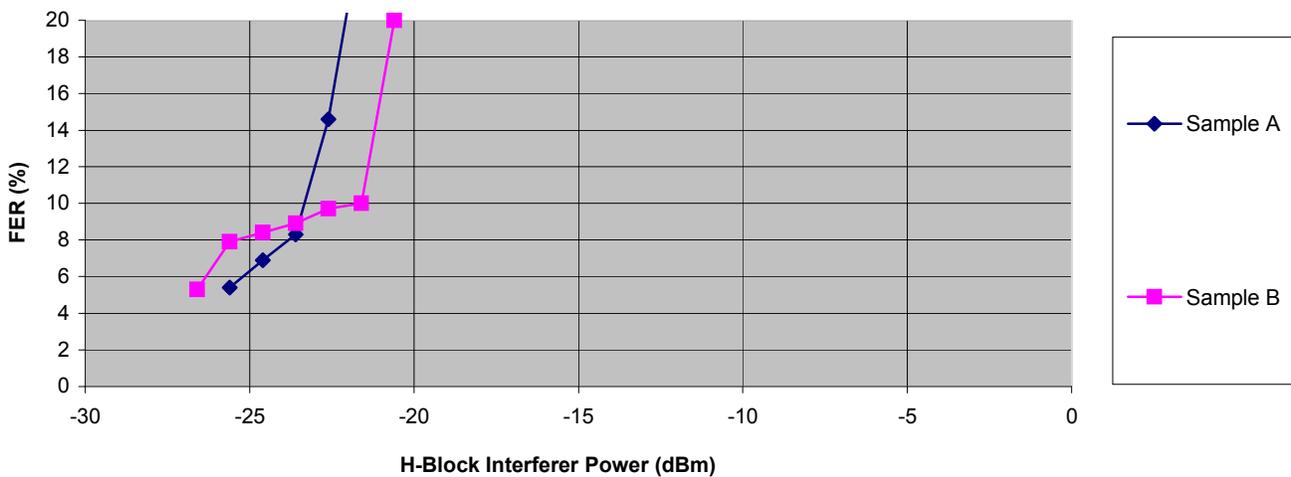
FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block GSM Interferer @ 1919.8 MHz
(Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block GSM Interferer @ 1919.8 MHz
(Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 40° C)



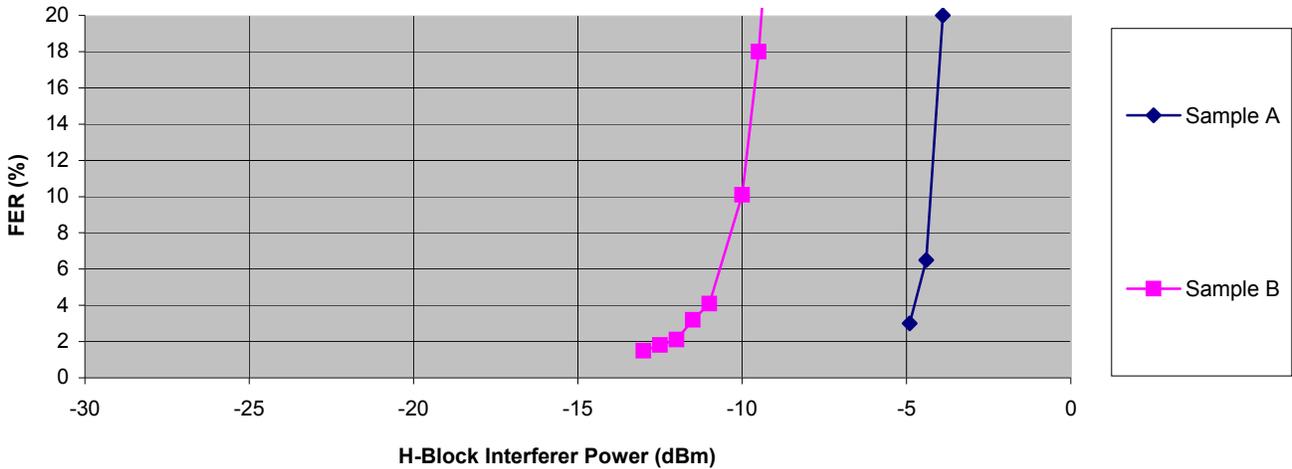
PCTEST™ REPORT		H - BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1-19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 11 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.5 Receiver Overload Test Results - CDMA

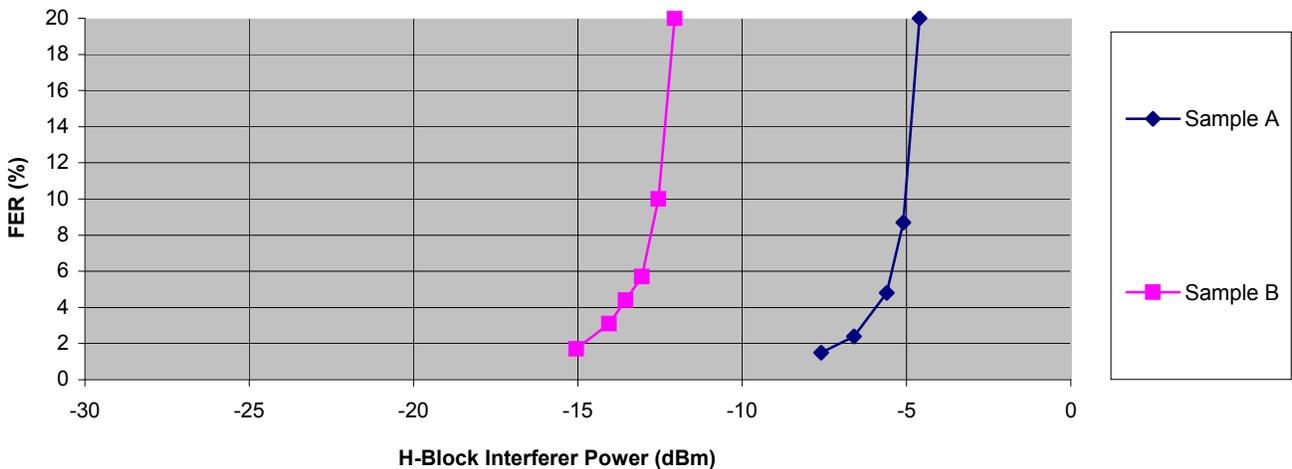
FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -100dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 40° C)



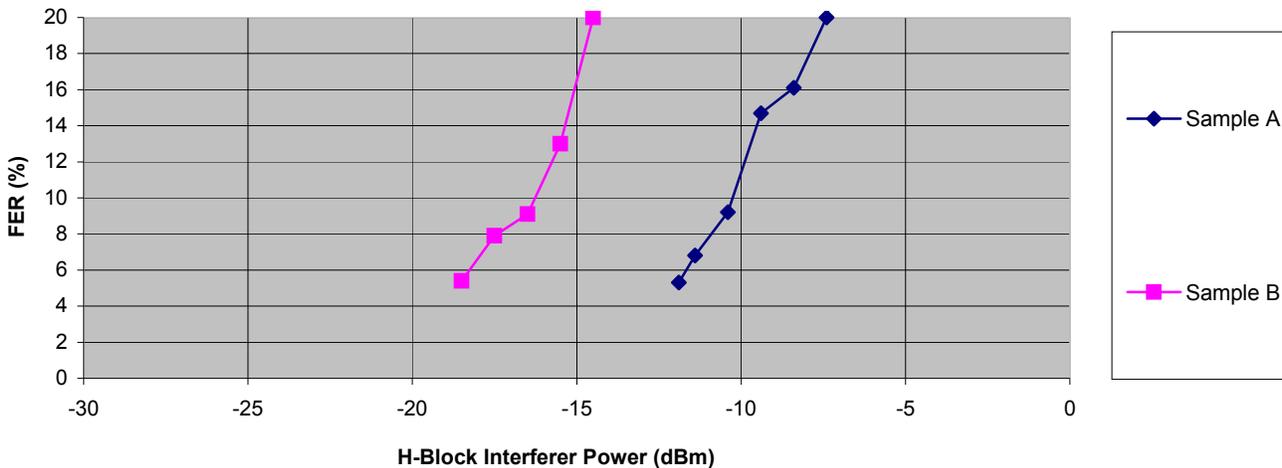
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Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 12 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.6 Receiver Overload Test Results - CDMA

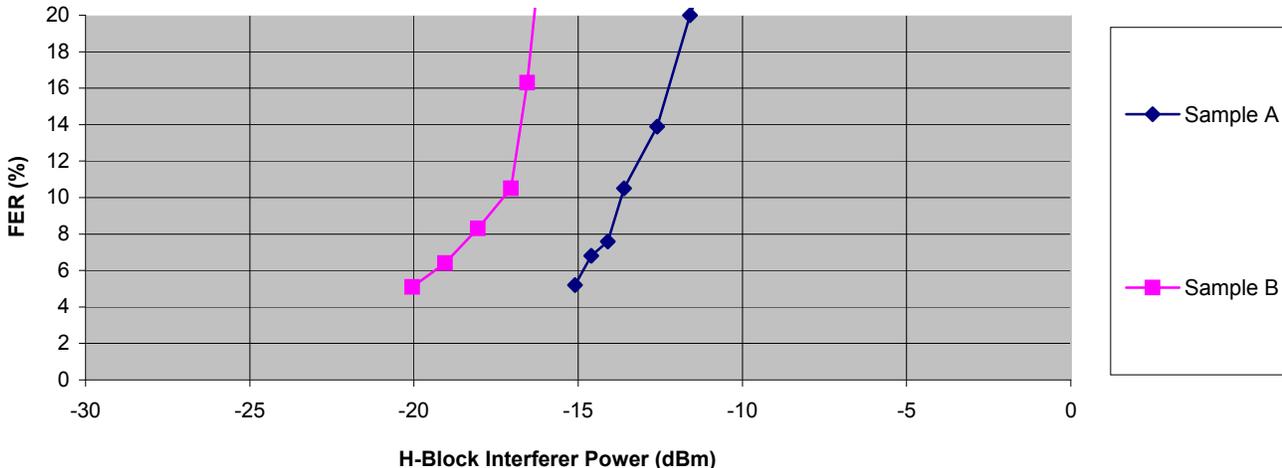
FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 40° C)



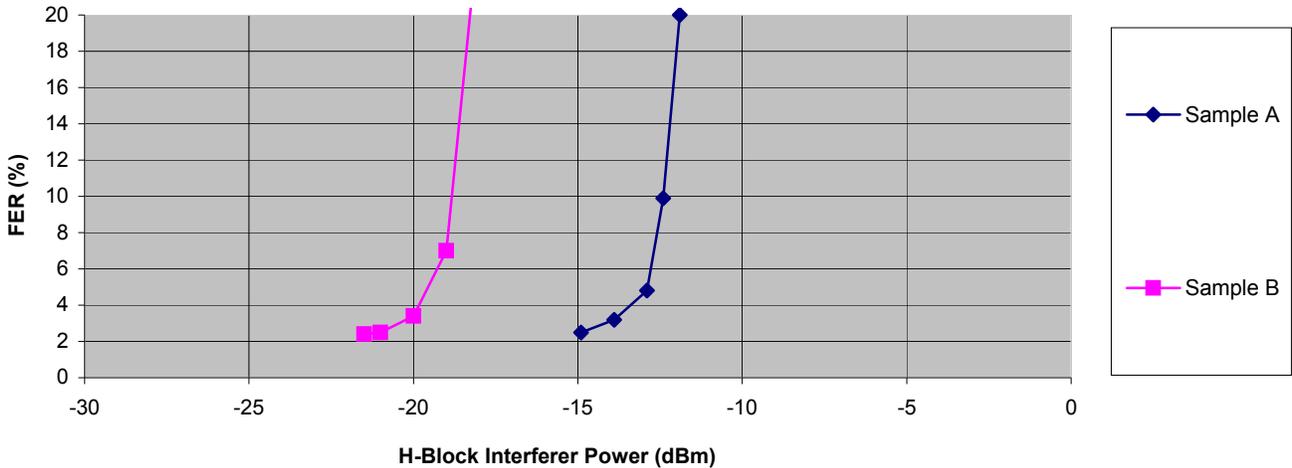
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 13 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.7 Receiver Overload Test Results - CDMA

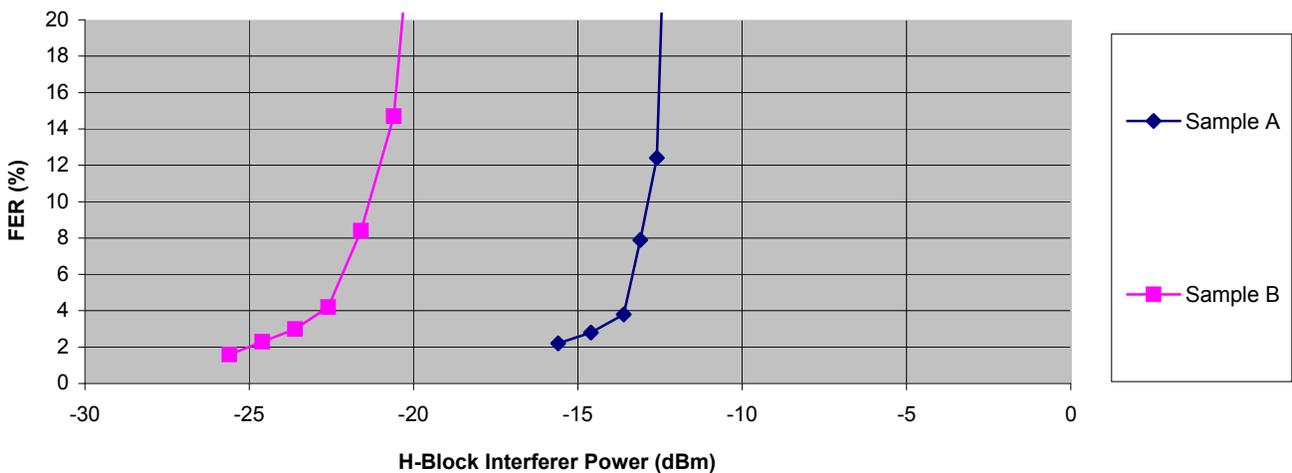
FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 450, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 450, T = 40° C)



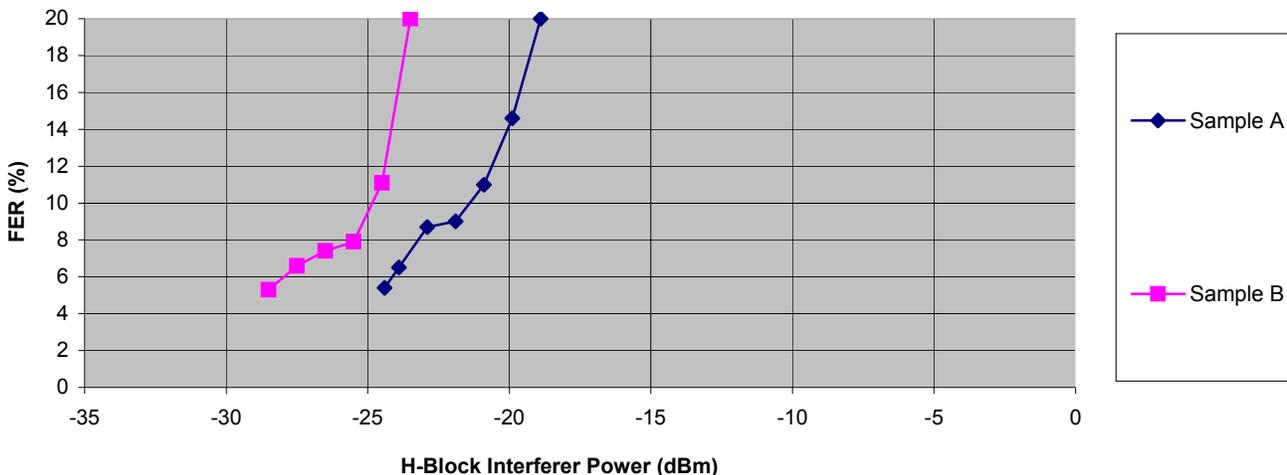
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 14 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.8 Receiver Overload Test Results - CDMA

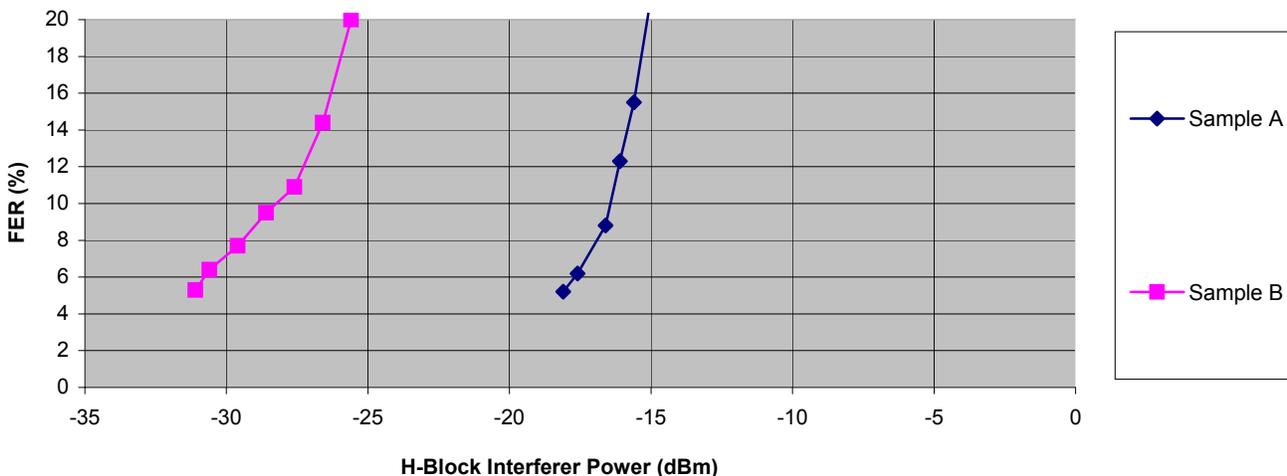
FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 450, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 450, T = 40° C)



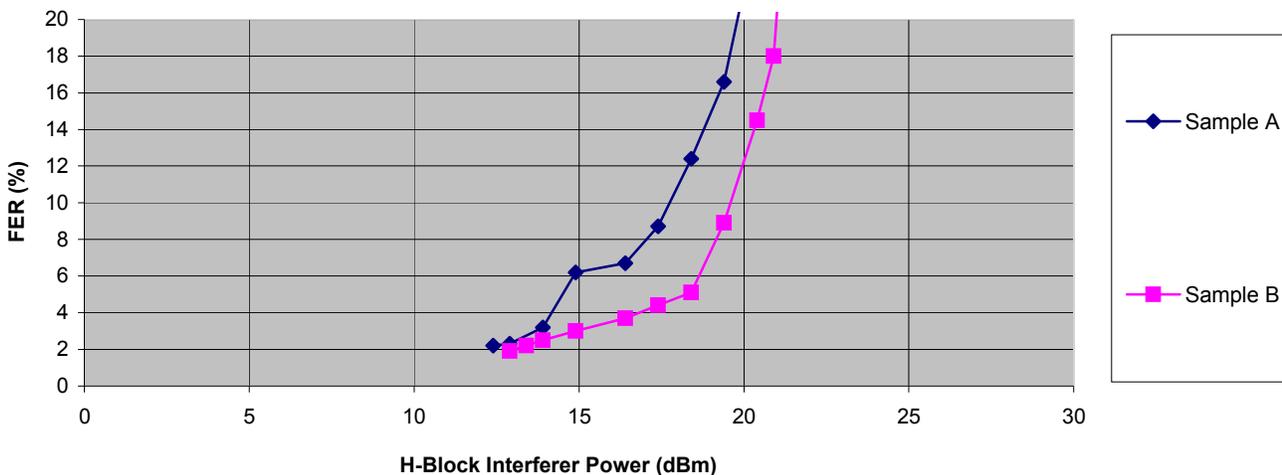
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 15 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.9 Receiver Overload Test Results - CDMA

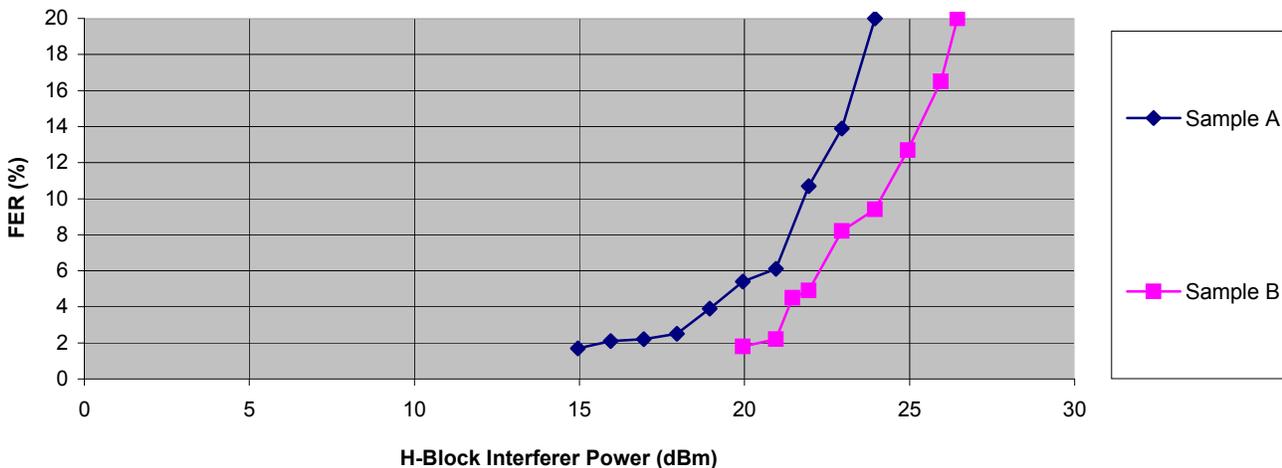
FER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 19° C)



FER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 40° C)



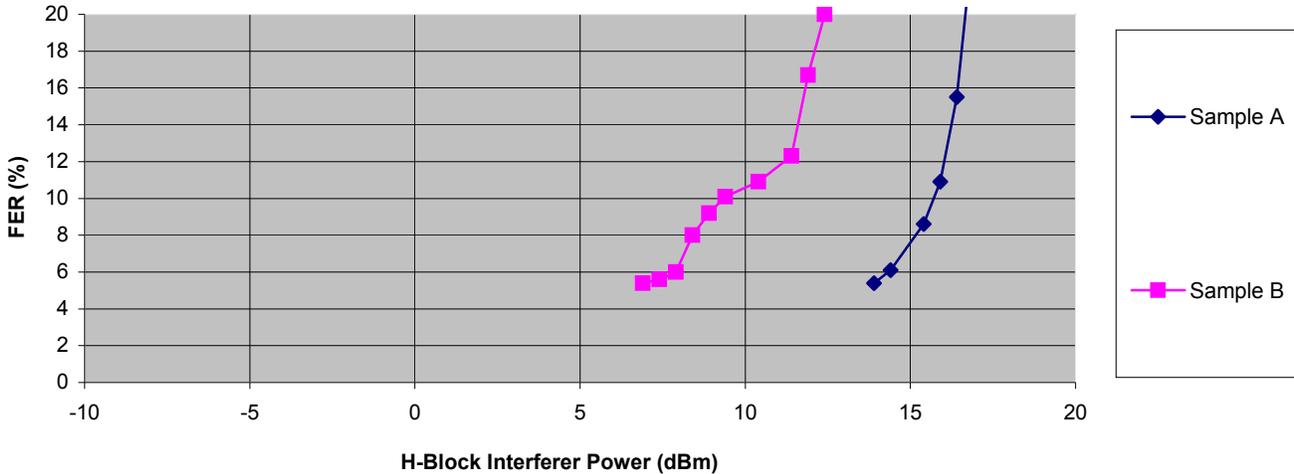
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 16 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.1.10 Receiver Overload Test Results - CDMA

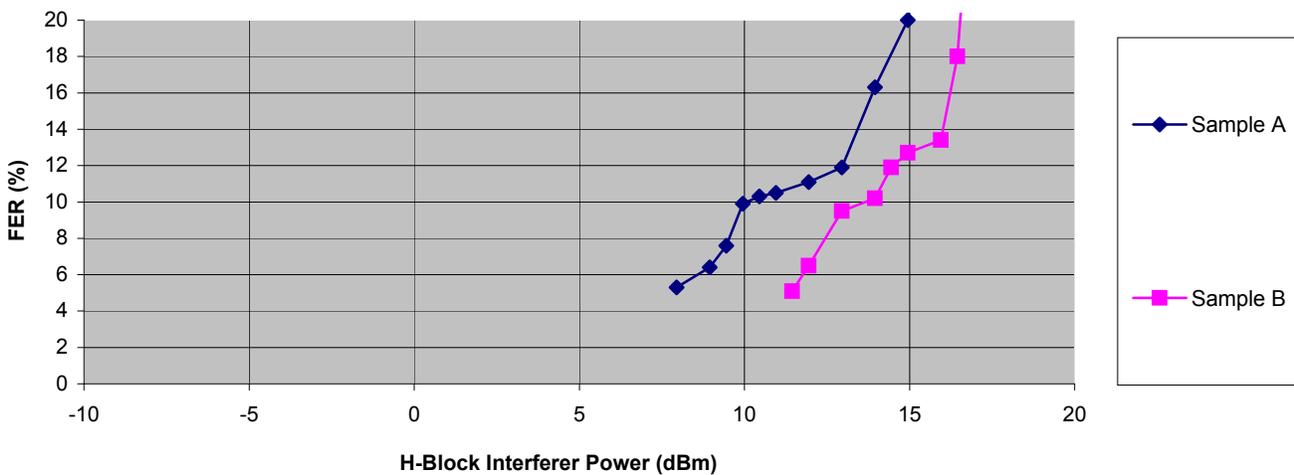
FER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 19° C)



FER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER= 5%, CDMA ch 25, T = 40° C)



PCTEST™ REPORT	PCTEST™ <small>Complete Wireless Lab™</small>	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 17 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.2 Intermodulation (IMD) Tests - CDMA

Victim/Block	Interferer/Type	RX level (dBm)
CDMA Channel 575/B	1918.75/CDMA	-100
CDMA Channel 575/B	1918.75/CDMA	-105
CDMA Channel 550/B	1917.5/CDMA	-100
CDMA Channel 550/B	1917.5/CDMA	-105

Table 3. Intermodulation (IMD) Test Setup - CDMA

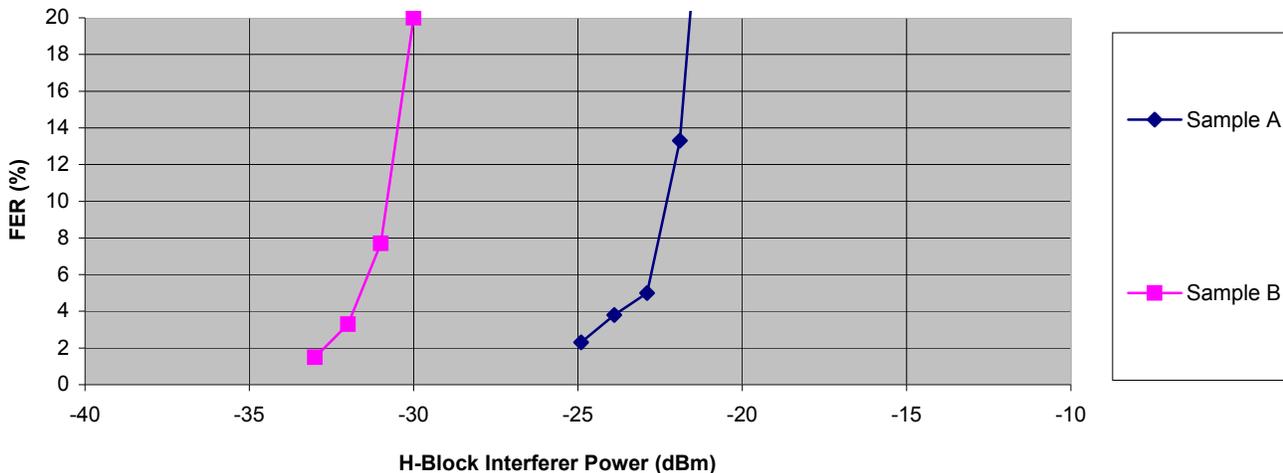
PCTEST™ REPORT	 PCTEST™ Complete Wireless Lab www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 18 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.2.1 Intermodulation (IMD) Test Results - CDMA

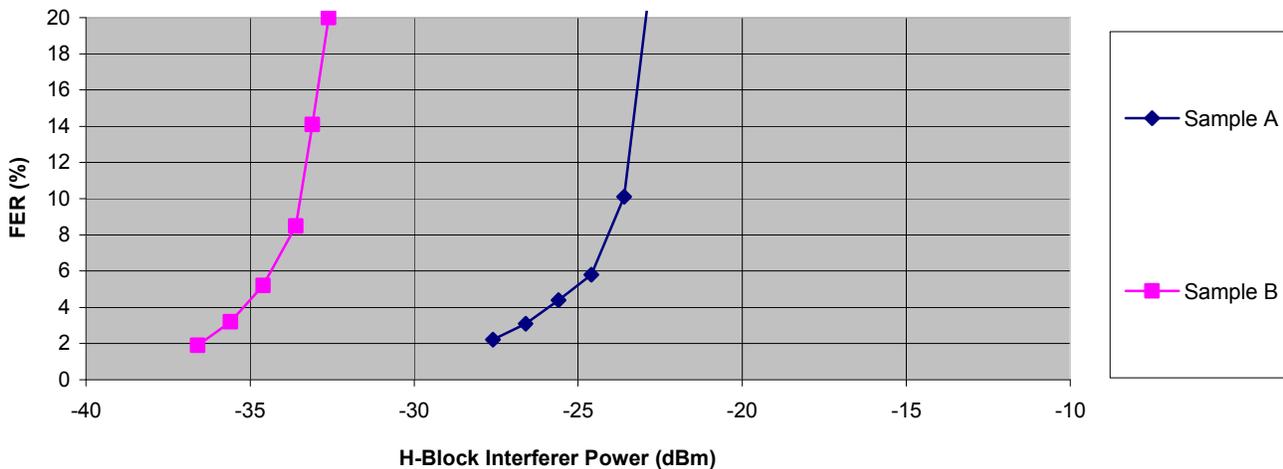
FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 575, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 575, T = 40° C)



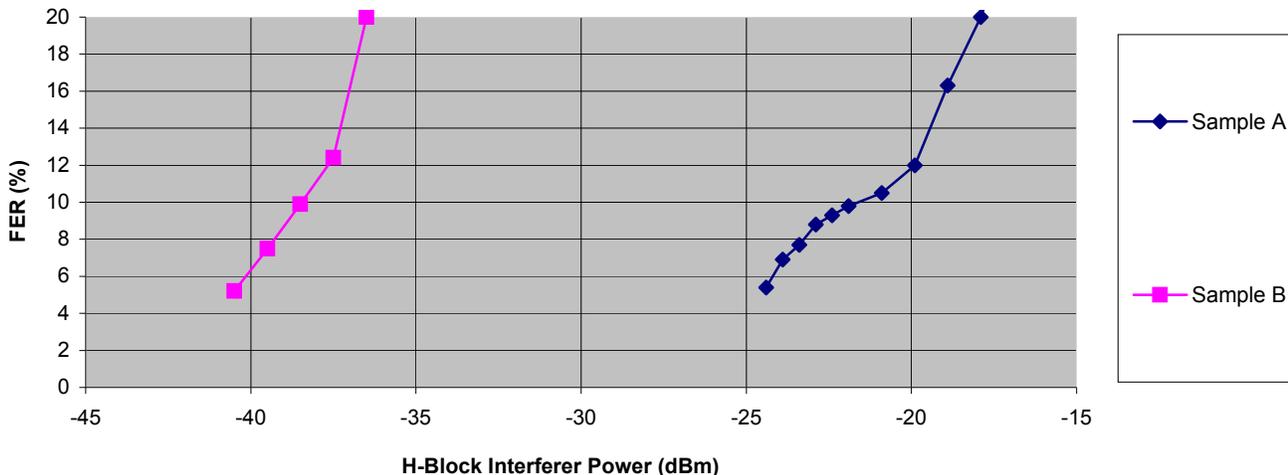
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 19 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.2.2 Intermodulation (IMD) Test Results - CDMA

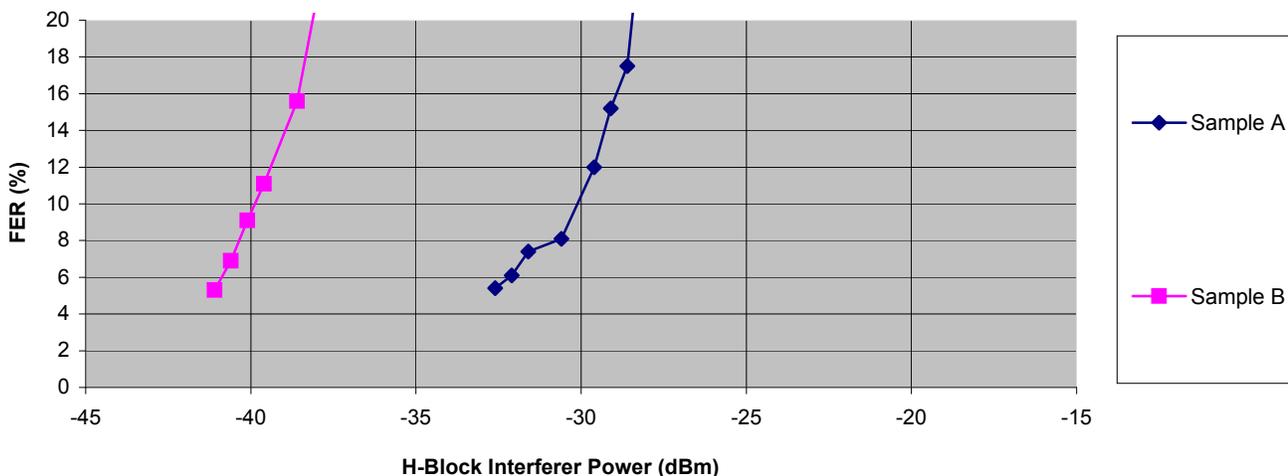
FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 575, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 575, T = 40° C)



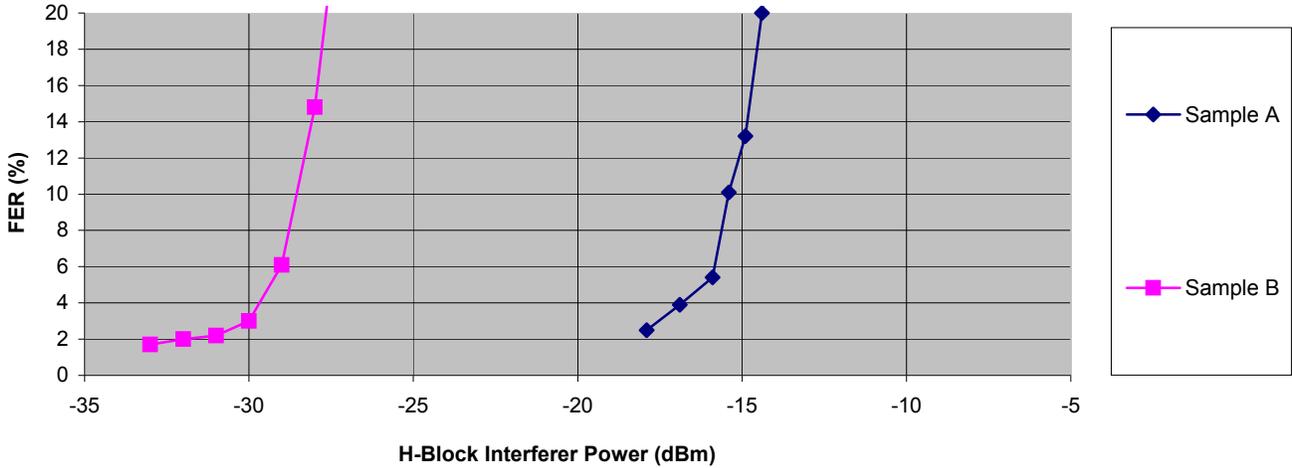
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 20 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.2.3 Intermodulation (IMD) Test Results - CDMA

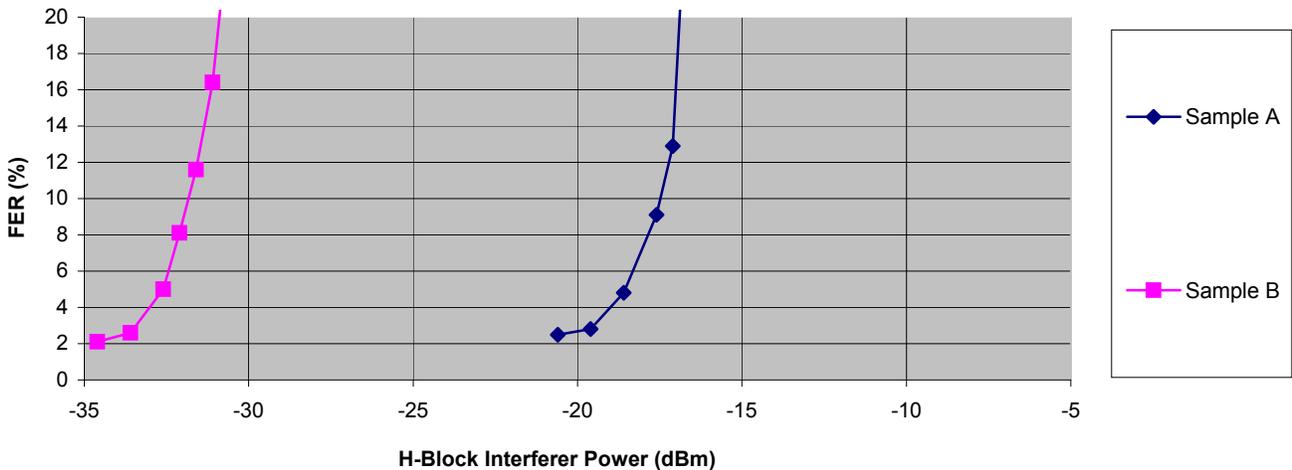
FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 550, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 550, T = 40° C)



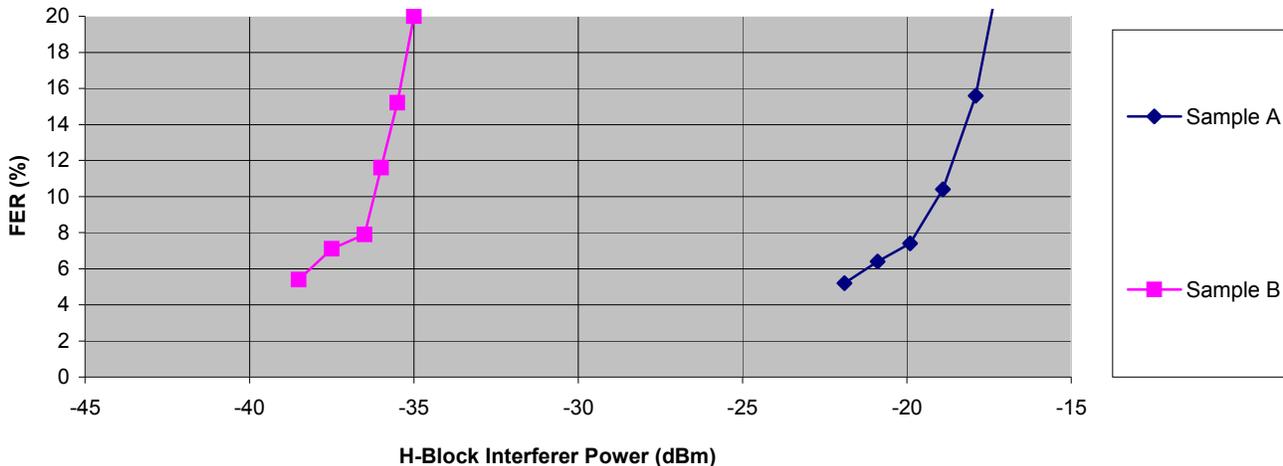
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
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4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.2.4 Intermodulation (IMD) Test Results - CDMA

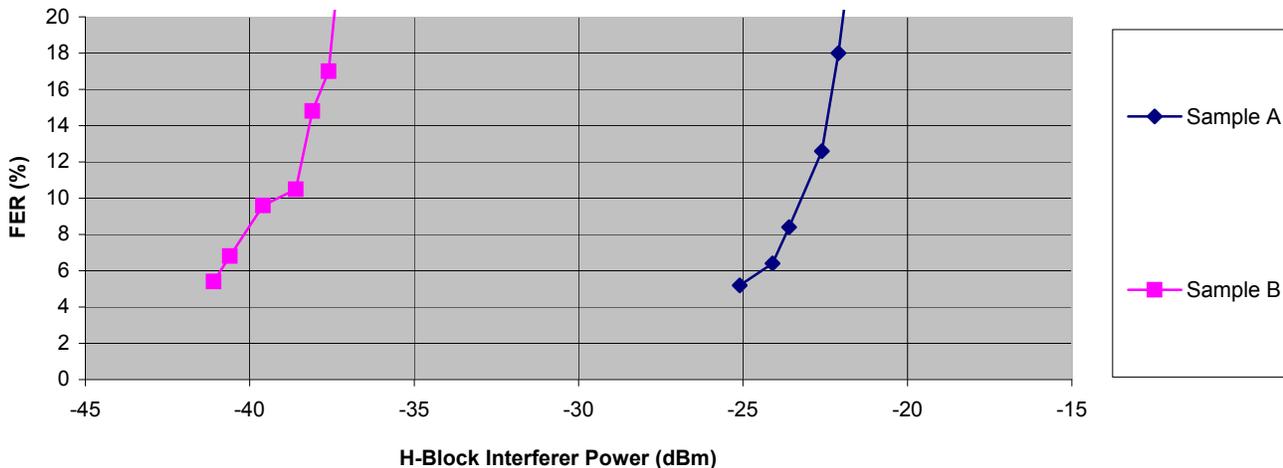
FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 550, T = 19° C)



FER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

CDMA MOBILE Phone FER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 550, T = 40° C)



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Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 22 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3 Receiver Overload Tests - GSM

Victim/Block	Interferer/Type	RX level (dBm)
GSM Channel 515/A	1918.75/CDMA	-102
GSM Channel 515/A	1918.75/CDMA	-97
GSM Channel 515/A	1919.8/GSM	-102
GSM Channel 515/A	1919.8/GSM	-97
GSM Channel 515/A	1917.5/CDMA	-102
GSM Channel 515/A	1917.5/CDMA	-97
GSM Channel 615/B	1918.75/CDMA	-102
GSM Channel 615/B	1918.75/CDMA	-97
GSM Channel 515/A	CDMA Channel 1175 C Block	-102
GSM Channel 515/A	CDMA Channel 1175 C Block	-97

Table 4. Receiver Overload Test Setup - GSM

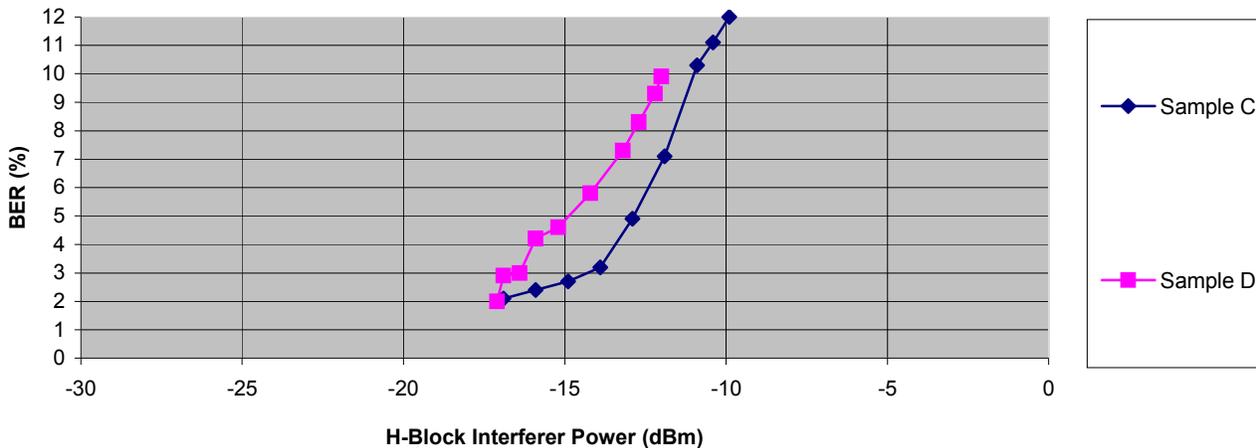
PCTEST™ REPORT	 PCTEST™ Complete Wireless Lab www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 23 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.1 Receiver Overload Test Results - GSM

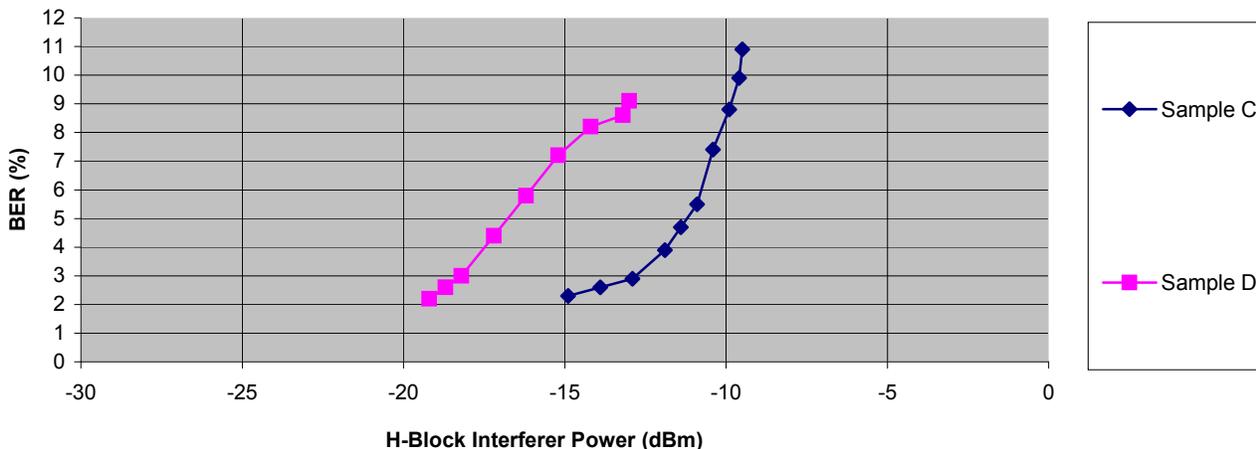
BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 40° C)



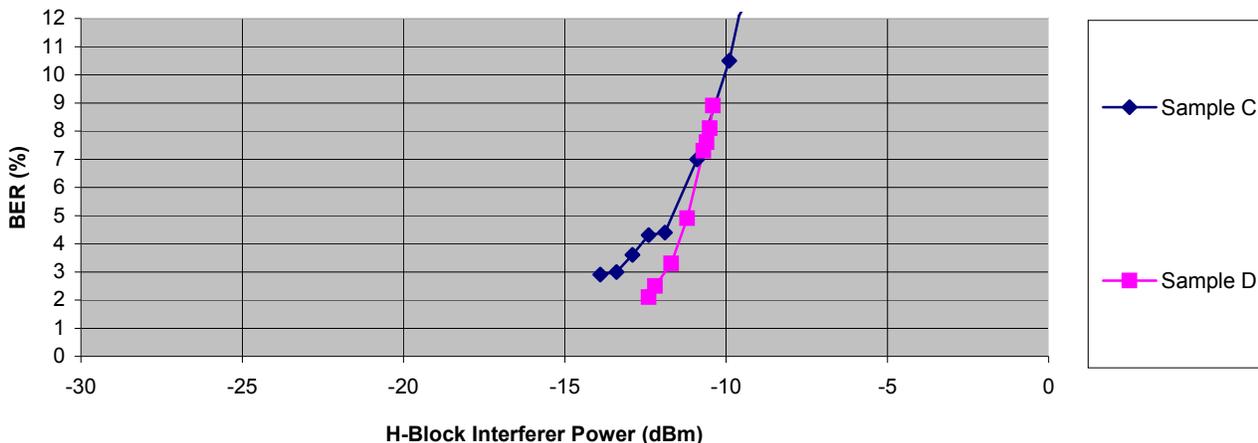
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
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4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.2 Receiver Overload Test Results - GSM

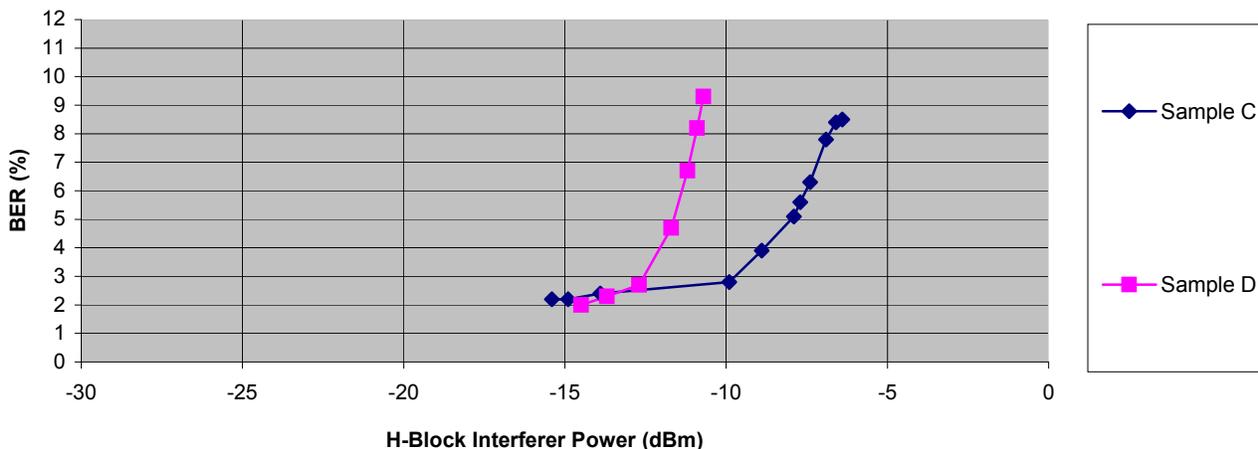
BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 40° C)



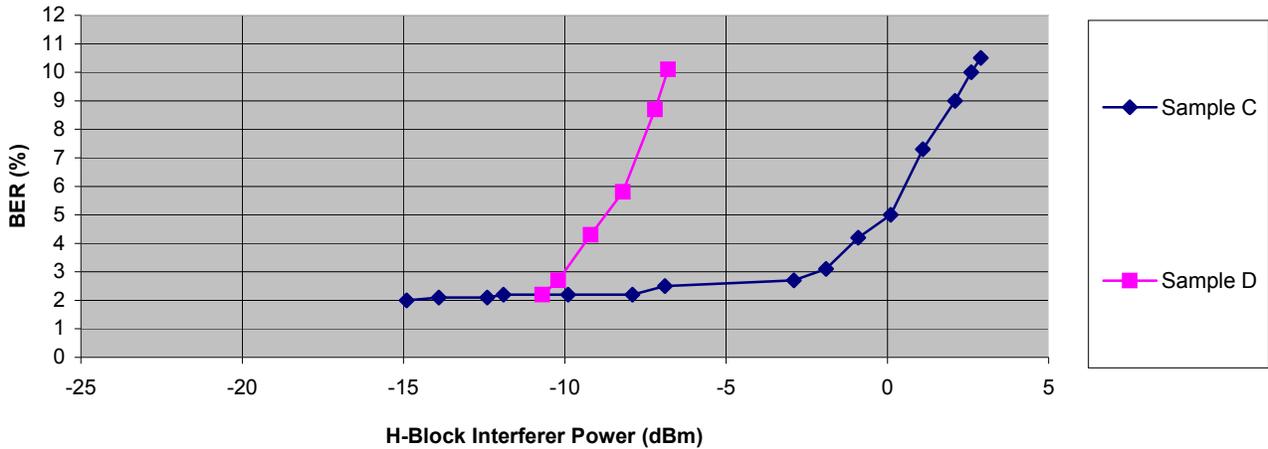
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 25 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.3 Receiver Overload Test Results - GSM

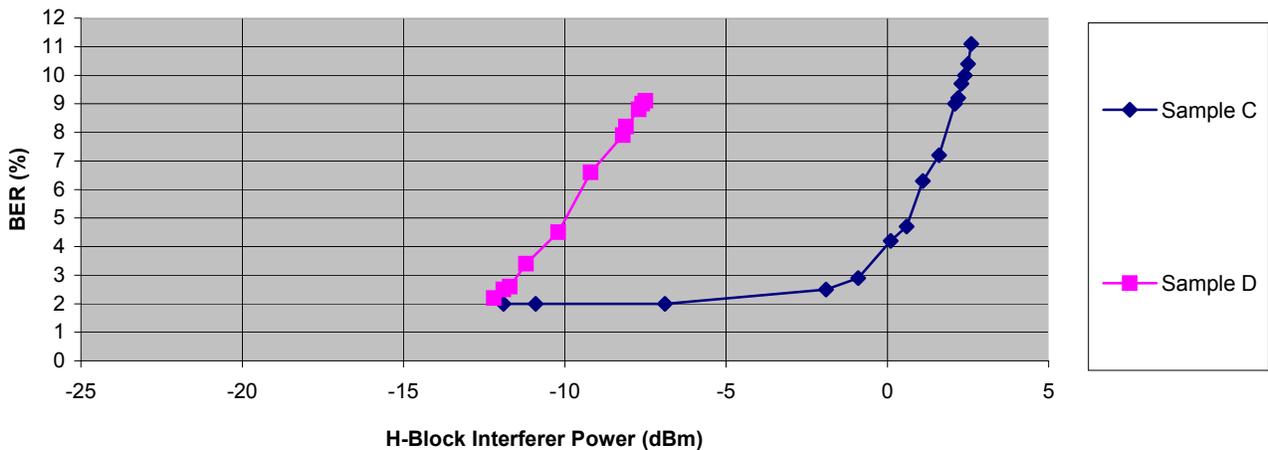
BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block GSM Interferer @ 1919.8 MHz
(Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block GSM Interferer @ 1919.8 MHz
(Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2% , GSM ch 515, T = 40° C)



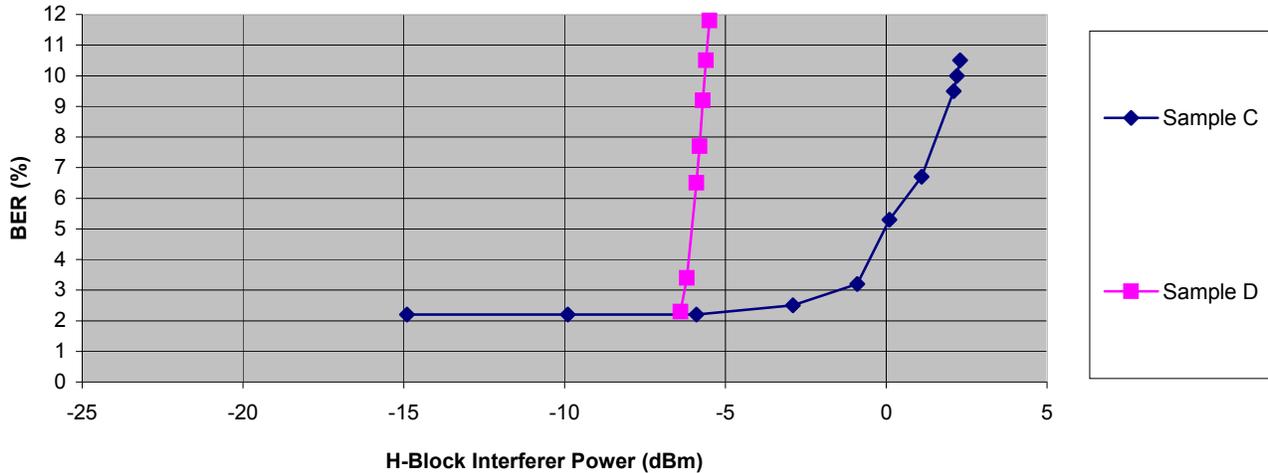
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 26 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.4 Receiver Overload Test Results - GSM

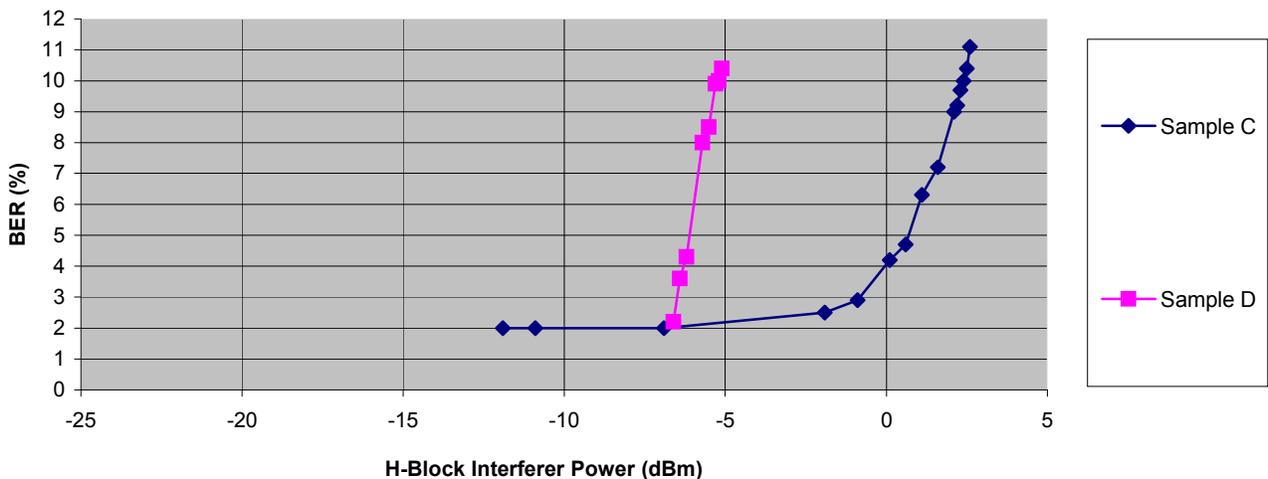
BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block GSM Interferer @ 1919.8 MHz
(Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block GSM Interferer @ 1919.8 MHz
(Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 40° C)



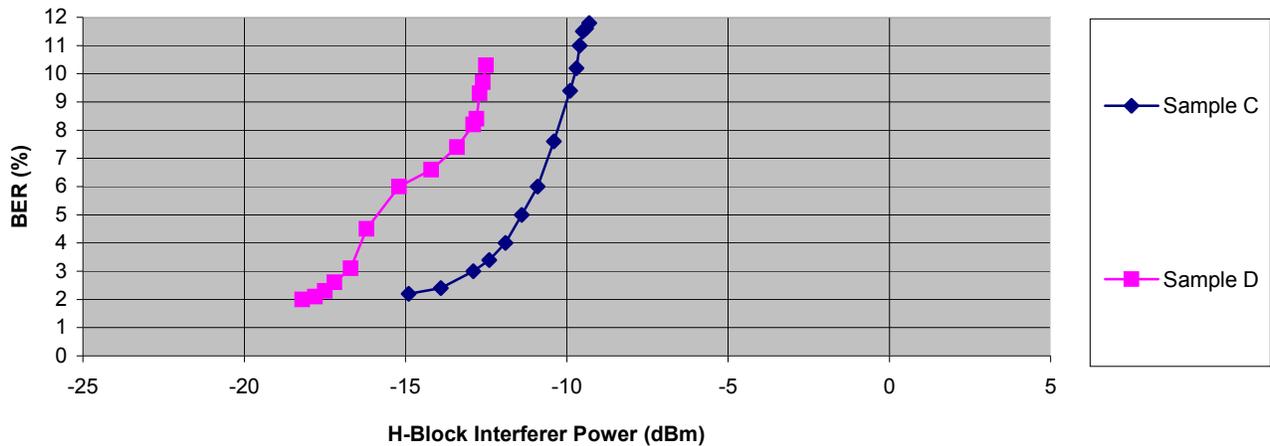
PCTEST™ REPORT		H - BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1-19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 27 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.5 Receiver Overload Test Results - GSM

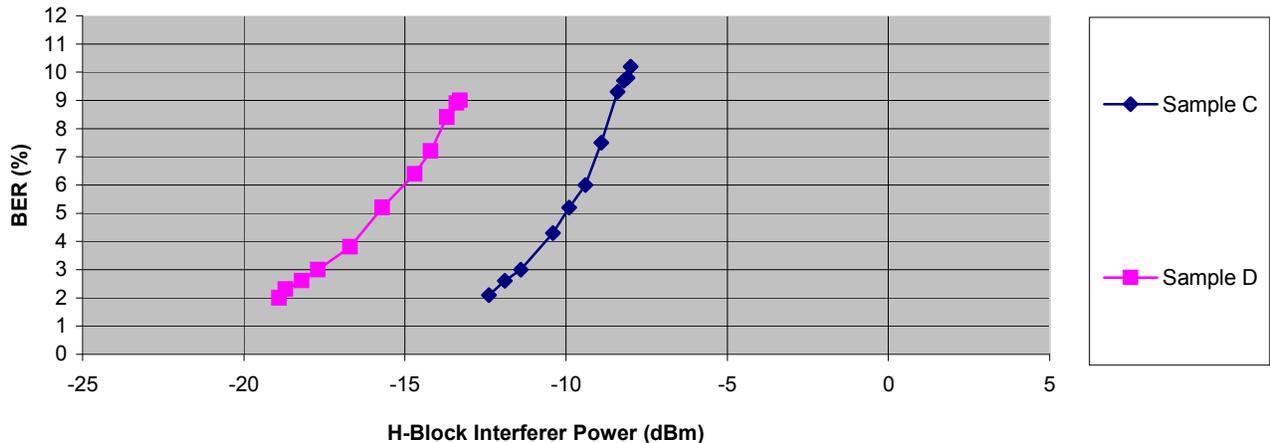
BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1917.5 MHz
(Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1917.5 MHz
(Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 40° C)



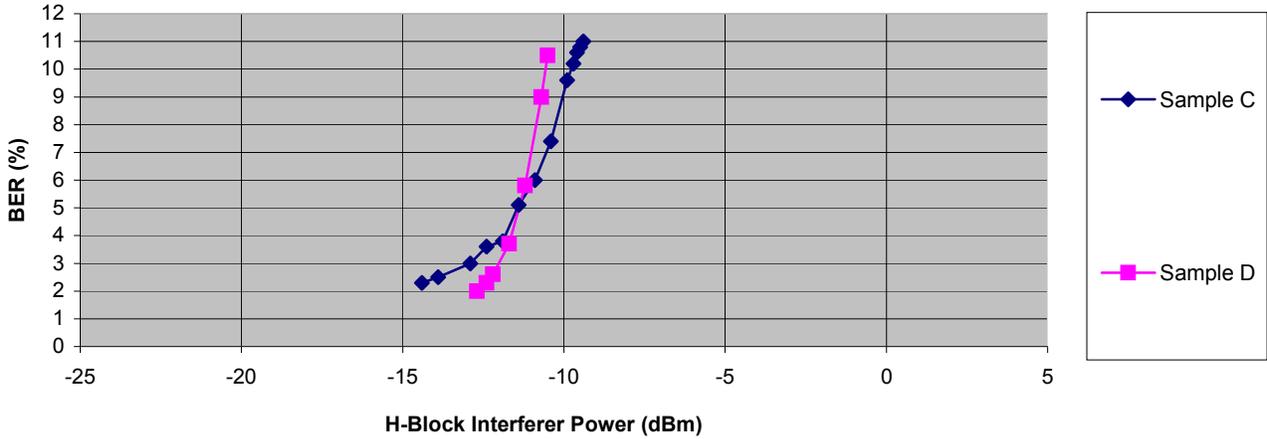
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
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4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.6 Receiver Overload Test Results - GSM

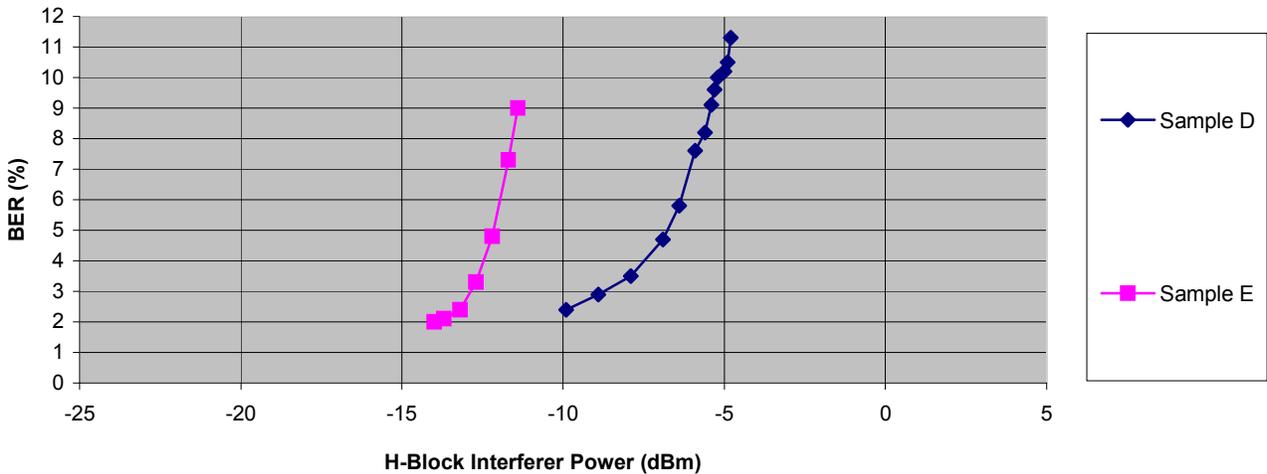
BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2.0%, GSM ch 515, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1917.5 MHz
 (Receive Level = -97, AWGN applied for BER = 1.6% - 2%, GSM ch 515, T = 40° C)



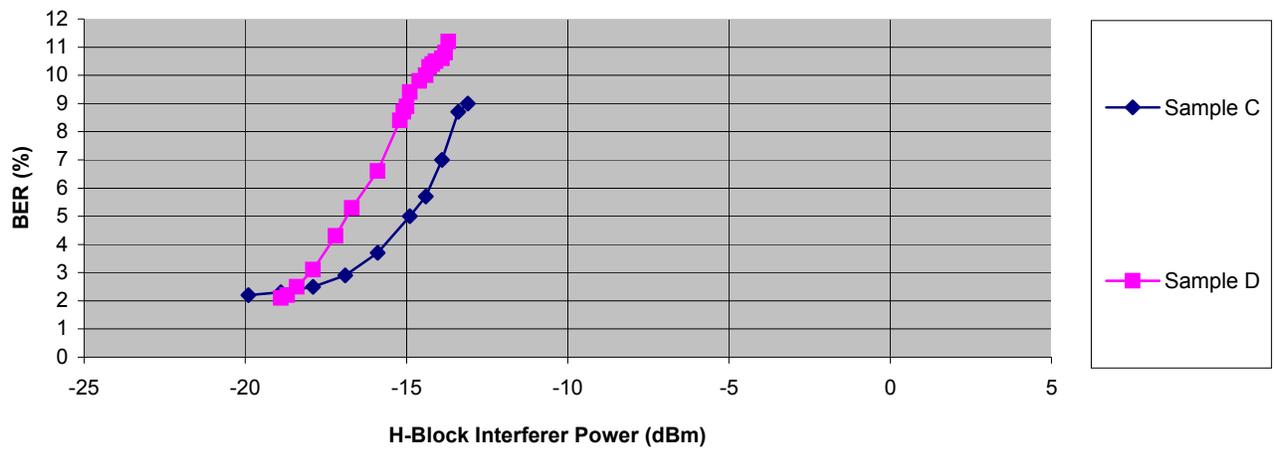
PCTEST™ REPORT	PCTEST™ <small>Complete Wireless Lab™</small>	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 29 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.7 Receiver Overload Test Results – GSM

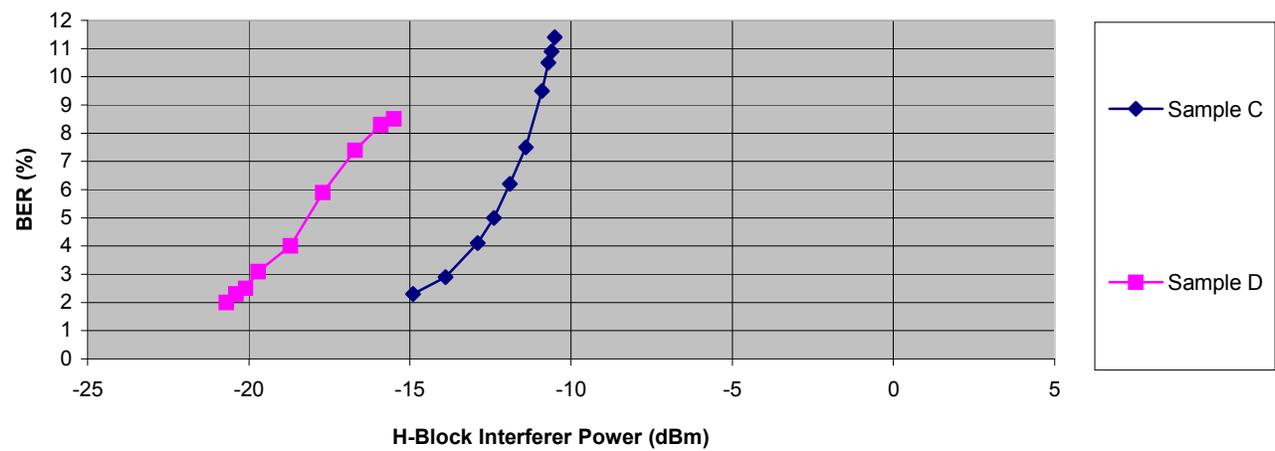
BER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2.0%, GSM ch 615, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 615, T = 40° C)



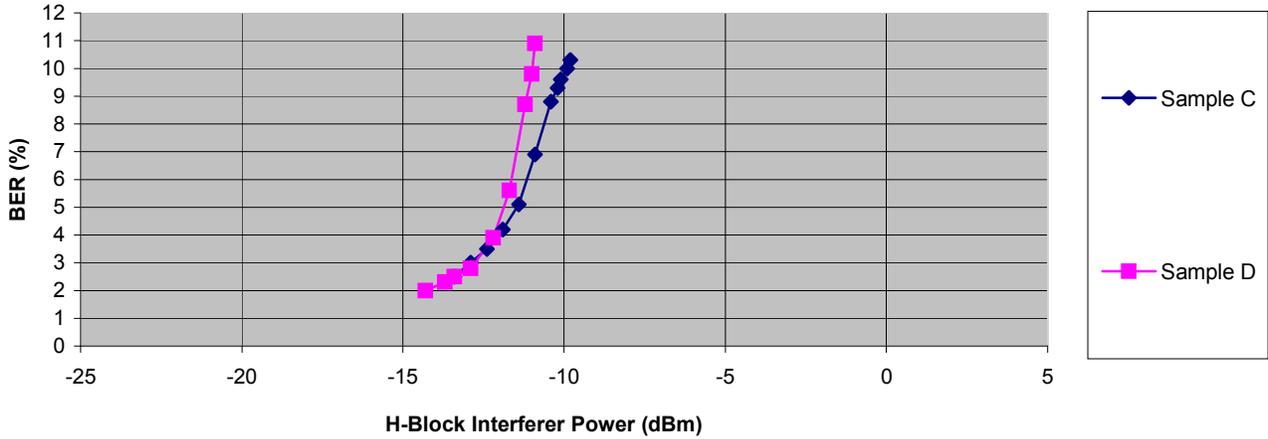
PCTEST™ REPORT	PCTEST™ <small>Complete Wireless Lab™</small>	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 30 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.8 Receiver Overload Test Results – GSM

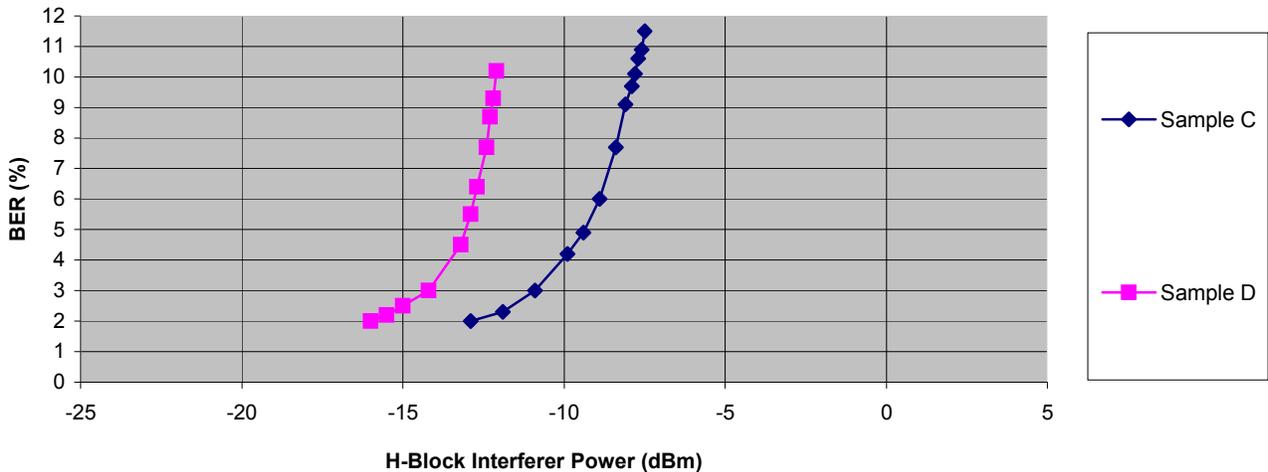
BER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 615, T = 19° C)



BER (%) vs. H Block RF Signal Power (dBm) at B Block antenna port

GSM MOBILE Phone BER vs. H-Block CDMA Interferer @ 1918.75 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 615, T = 40° C)



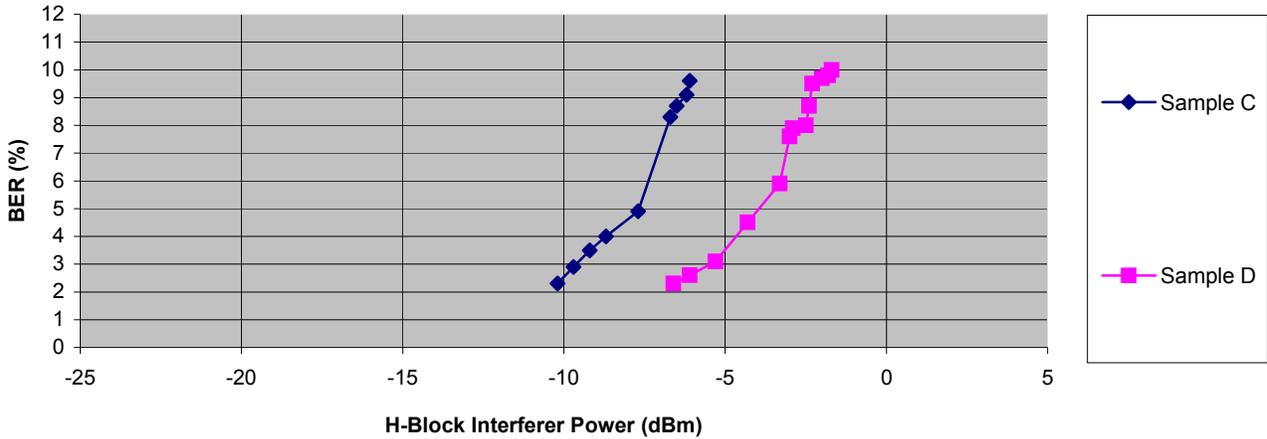
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 31 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.9 Receiver Overload Test Results – GSM

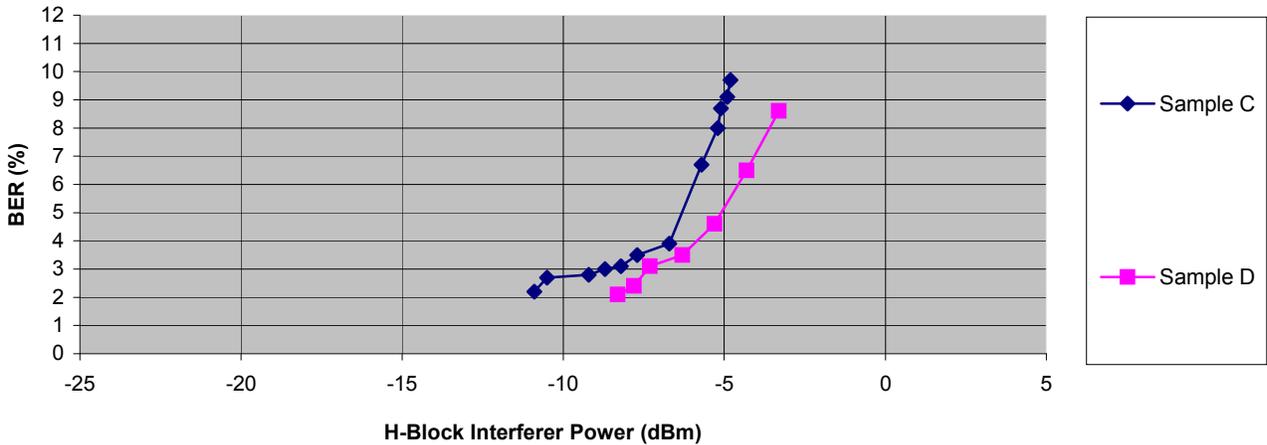
BER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



BER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 40° C)



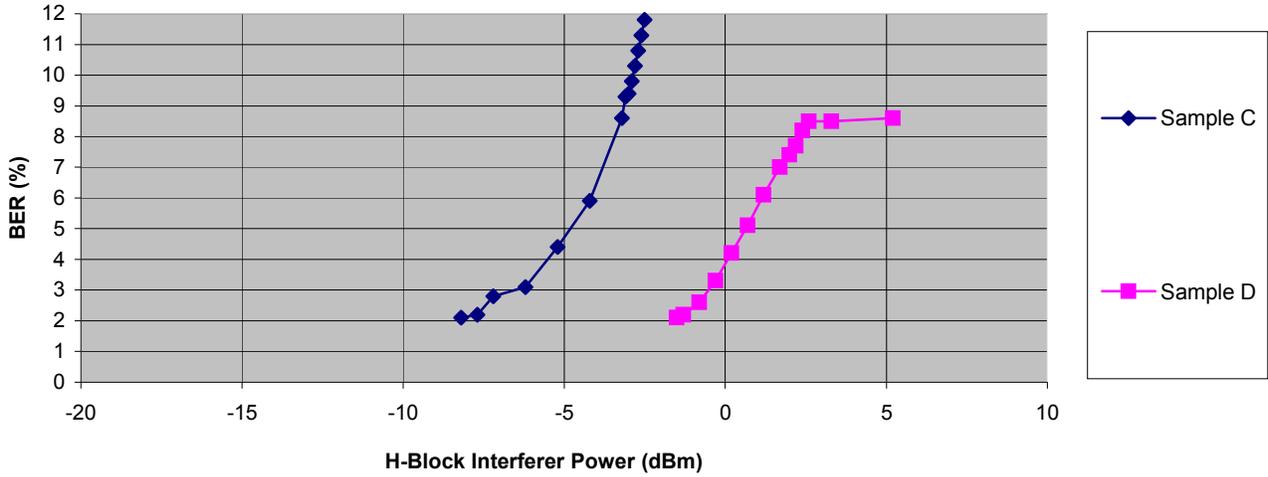
PCTEST™ REPORT		H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 32 of 94

4. RECEIVER OVERLOAD AND IMD TEST RESULTS (Cont.)

4.3.10 Receiver Overload Test Results – GSM

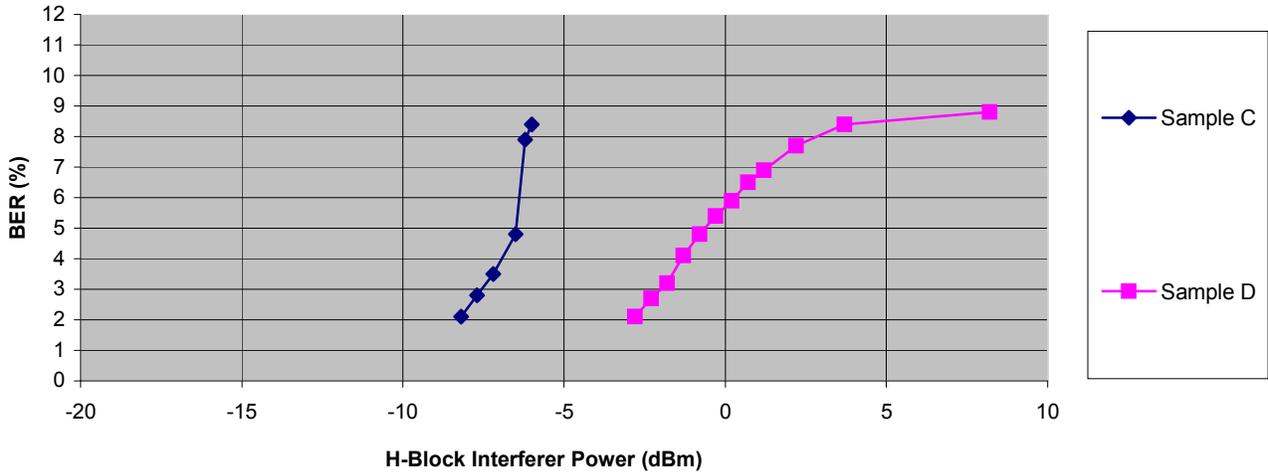
BER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



BER (%) vs. C Block RF Signal Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. C-Block CDMA Interferer @ 1908.75 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 40° C)



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Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 33 of 94

5. DESENSITIZATION FROM AWGN TEST RESULTS

5.1 AWGN Tests – CDMA

Victim/Block	Interferer/Type	RX level (dBm)
CDMA Channel 25/A	Channel 25/A AWGN	-100
CDMA Channel 25/A	Channel 25/A AWGN	-105

Table 5. AWGN Test Setup - CDMA

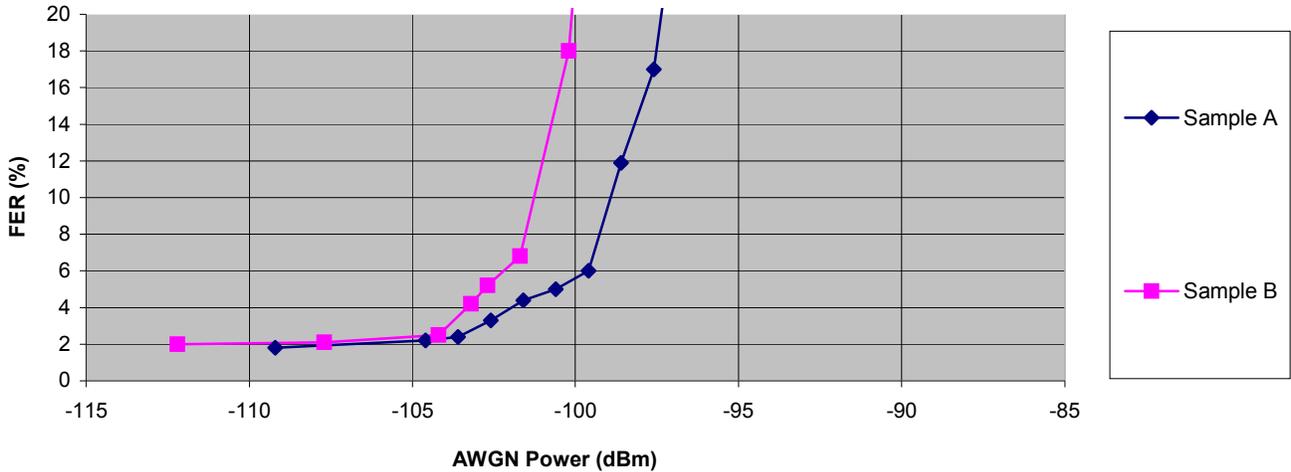
PCTEST™ REPORT	 PCTEST™ Complete Wireless Lab www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 34 of 94

5. DESENSITIZATION FROM AWGN TEST RESULTS (Cont.)

5.1.1 AWGN Test Results - CDMA

FER (%) vs. AWGN Power (dBm) at A Block antenna port

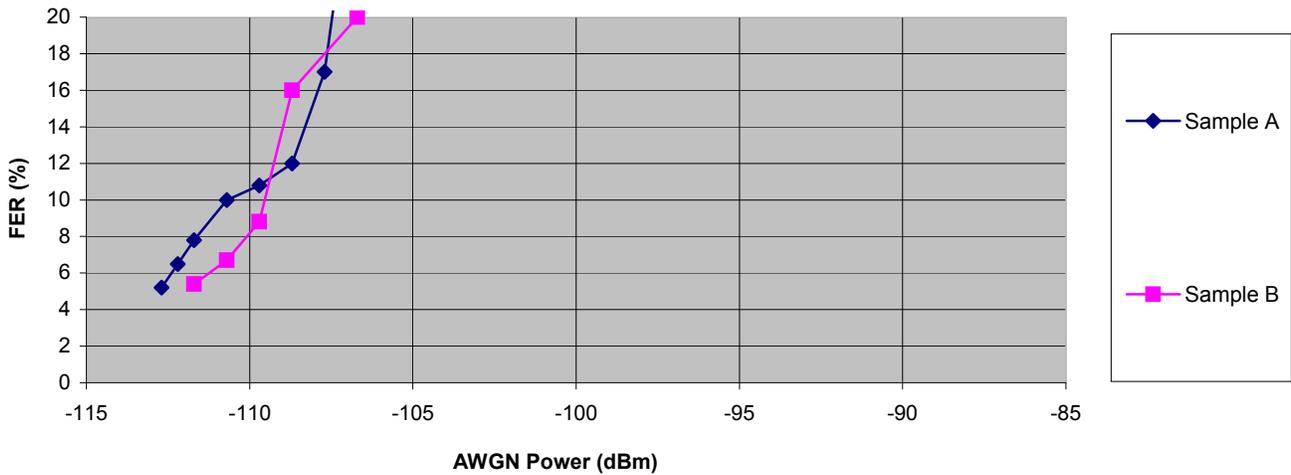
CDMA MOBILE Phone FER vs. AWGN Interferer @ 1931.25 MHz
 (Receive Level = -100 dBm, AWGN applied for Baseline FER = 1%, CDMA ch 25, T = 19° C)



5.1.2 AWGN Test Results – CDMA

FER (%) vs. AWGN Power (dBm) at A Block antenna port

CDMA MOBILE Phone FER vs. AWGN Interferer @ 1931.25 MHz
 (Receive Level = -105 dBm, AWGN applied for Baseline FER = 5%, CDMA ch 25, T = 19° C)



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Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 35 of 94

5. DESENSITIZATION FROM AWGN TEST RESULTS (Cont.)

5.2 AWGN Tests - GSM

Victim/Block	Interferer/Type	RX level (dBm)
GSM Channel 515/A	Channel 515/A AWGN	-102
GSM Channel 515/A	Channel 515/A AWGN	-97

Table 6. AWGN Test Setup - GSM

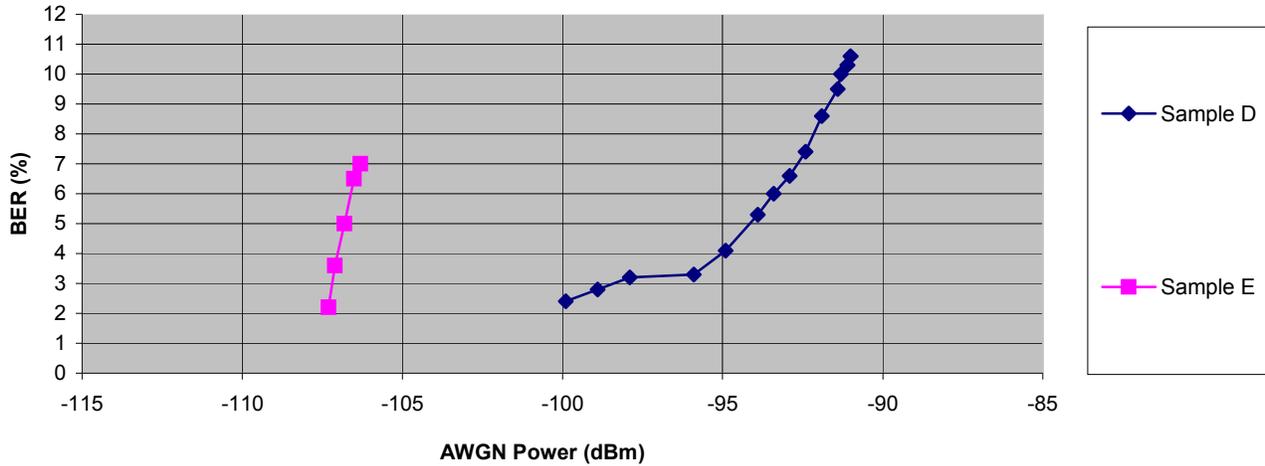
PCTEST™ REPORT	 PCTEST™ Complete Wireless Lab www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 36 of 94

5. DESENSITIZATION FROM AWGN TEST RESULTS (Cont.)

5.2.1 AWGN Test Results - GSM

BER (%) vs. AWGN Power (dBm) at A Block antenna port

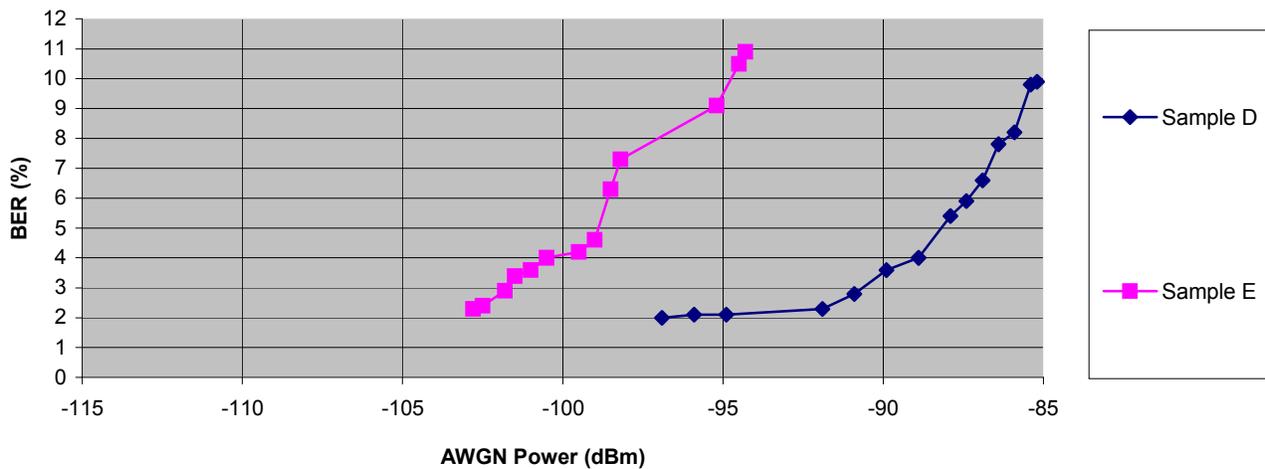
GSM MOBILE Phone BER vs. AWGN Interferer @ 1930.8 MHz
 (Receive Level = -102 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



5.2.2 AWGN Test Results - GSM

BER (%) vs. AWGN Power (dBm) at A Block antenna port

GSM MOBILE Phone BER vs. AWGN Interferer @ 1930.8 MHz
 (Receive Level = -97 dBm, AWGN applied for Baseline BER = 1.6% - 2%, GSM ch 515, T = 19° C)



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Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 37 of 94

6. OUT-OF-BAND EMISSIONS (OOBE) TEST RESULTS

6.1 OOBE TESTS

EUT Transmitter Block	Measurement (dBm/MHz)	TX Output Power
A Block CDMA Chan. 275	OOBE (1930-1932 MHz)	Maximum
A Block CDMA Chan. 275	OOBE (1930-1932 MHz)	10dB below Maximum
B Block CDMA Chan. 600	OOBE (1930-1932 MHz)	Maximum
B Block CDMA Chan. 600	OOBE (1930-1932 MHz)	10dB below Maximum
C Block CDMA Chan. 1175	OOBE (1930-1932 MHz)	Maximum
C Block CDMA Chan. 1175	OOBE (1930-1932 MHz)	10dB below Maximum

Table 7. Out-of Band Emissions Test Setup – CDMA

EUT Transmitter Block	Measurement (dBm/MHz)	TX Output Power
A Block GSM Chan. 585	OOBE (1930-1932 MHz)	Maximum
A Block GSM Chan. 585	OOBE (1930-1932 MHz)	10dB below Maximum
B Block GSM Chan. 615	OOBE (1930-1932 MHz)	Maximum
B Block GSM Chan. 615	OOBE (1930-1932 MHz)	10dB below Maximum
C Block GSM Chan. 807	OOBE (1930-1932 MHz)	Maximum
C Block GSM Chan. 807	OOBE (1930-1932 MHz)	10dB below Maximum

Table 8. Out-of Band Emissions Test Setup - GSM

PCTEST™ REPORT	 PCTEST™ Complete Wireless Lab www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 38 of 94

6. OUT-OF-BAND EMISSIONS (OOBE) TEST RESULTS (Cont.)

Sample A Test Results

Channel	Frequency	Block	EUT Power	OOBE Level (dBm/MHz)	
				Room Temp.	40° C
275	1863.75	A	Max	- 92.5	- 91.5
275	1863.75	A	10dB below Max	- 91.5	- 90.8
600	1880.00	B	Max	- 92.5	- 91.5
600	1880.00	B	10dB below Max	- 91.3	- 90.4
1175	1908.75	C	Max	- 92.0	- 91.3
1175	1908.75	C	10dB below Max	- 91.8	- 91.1

Sample B Test Results

Channel	Frequency	Block	EUT Power	OOBE Level (dBm/MHz)	
				Room Temp.	40° C
275	1863.75	A	Max	- 92.5	- 91.5
275	1863.75	A	10dB below Max	- 91.6	- 90.8
600	1880.00	B	Max	- 92.5	- 91.5
600	1880.00	B	10dB below Max	- 91.7	- 90.3
1175	1908.75	C	Max	- 92.5	- 91.5
1175	1908.75	C	10dB below Max	- 91.9	- 90.7

PCTEST™ REPORT	 PCTEST™ Complete Wireless Lab www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 39 of 94

6. OUT-OF-BAND EMISSIONS (OOBE) TEST RESULTS (Cont.)

Sample C Test Results

Channel	Frequency	Block	EUT Power	OOBE Level (dBm/MHz)	
				Room Temp.	40° C
585	1864.8	A	Max	- 79.8	- 81.5
585	1864.8	A	10dB below Max	- 82.3	- 81.0
615	1870.8	B	Max	- 79.3	- 78.9
615	1870.8	B	10dB below Max	- 80.4	- 78.1
807	1909.2	C	Max	- 80.4	- 79.0
807	1909.2	C	10dB below Max	- 82.0	- 81.2

Sample D Test Results

Channel	Frequency	Block	EUT Power	OOBE Level (dBm/MHz)	
				Room Temp.	40° C
585	1864.8	A	10dB below Max	- 83.3	- 83.4
615	1870.8	B	Max	- 78.9	- 78.7
615	1870.8	B	10dB below Max	- 83.6	- 83.4
807	1909.2	C	Max	- 71.9	- 72.5
807	1909.2	C	10dB below Max	- 79.8	- 78.4

PCTEST™ REPORT	 Complete Wireless Lab www.pctest.com	H – BLOCK MEASUREMENT REPORT	Tested by: Gregory Czumak, QM
Test Report S/N: H-241019614-R3.CTIA	Test Dates: November 1–19, 2004	Phone Type(s): CDMA & GSM Mobile Phones	Page 40 of 94