UltraTech
Group of Labs

June 13, 2001

INTERSIL CORPORATION
2401 Palm Bay Rd. NE
Palm Bay, Florida
USA 32905

Attn.: **Mr. Bartow Willingham**

Subject: **FCC Certification Application Testing under FCC PART 15, Subpart C, Sec. 15.247 - Direct Sequence Spread Spectrum Transmitters operating in the frequency band 2400 - 2483.5 MHz.**

Product: **PRISM 2.5 PCMCIA**
Model No.: **ISL37300P**
FCC ID: **OSZ37300PC**

Dear Mr. Willingham,

The product sample, as provided by you, has been tested and found to comply with **FCC PART 15, Subpart C, Sec. 15.247 - Direct Sequence Spread Spectrum Transmitters operating in the frequency band 2400 - 2483.5 MHz.**

- Modular Transmitter Approval Request:- This application is subject to the FCC certification for a modular transceiver, please kindly refer to the Section 6.5 of the submitted test report for clarification of compliance for this modular transmitter with FCC Public Notice DA 00-1407.
- Compliance with RF Exposure Requirements:
  - The transmitter complies with FCC 2.1093 and FCCOET Bulletin 65 (August 1997) with SAR Level < 0.01 W/Kg with body tissue. Please refer to attached SAR test report.

Enclosed you will find copy of the engineering report. If you have any queries, please do not hesitate to contact us.

Yours truly,

Tri Minh Luu, P. Eng.,
V.P., Engineering

Encl

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ENGINEERING TEST REPORT

PRISM 2.5 PCMCIA
Model No.: ISL37300P

FCC ID: OSZ37300PC

Applicant: **INTERSIL CORPORATION**
2401 Palm Bay Rd. NE
Palm Bay, Florida

In Accordance With

FEDERAL COMMUNICATIONS COMMISSION (FCC)
PART 15, SUBPART C, SEC. 15.247
Direct Sequence Spread Spectrum Transmitters operating in the frequency band 2400 - 2483.5 MHz

UltraTech's File No.: CLS-061FCC15C

This Test report is issued under the Authority of Tri M. Luu, Professional Engineer, Vice President of Engineering UltraTech Group of Labs Date: June 13, 2001	
Report Prepared by: Toan Truong	Tested by: Hung Trinh
Issued Date: June 13, 2001	Test Dates: Feb 6 – June 8, 2001

The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.

UltraTech

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EXHIBIT 1. SUBMITTAL CHECK LIST

Annex No.	Exhibit Type	Description of Contents	Quality Check (OK)
	Test Report	• Exhibit 1: Submittal check lists • Exhibit 2: Introduction • Exhibit 3: Performance Assessment • Exhibit 4: EUT Operation and Configuration during Tests • Exhibit 5: Summary of test Results • Exhibit 6: Measurement Data • Exhibit 7: Measurement Uncertainty • Exhibit 8: Measurement Methods	OK
1	Test Report - Plots of Measurement Data	Plots # 1 to 54	
2	Test Setup Photos	Photos # 1 to 4	OK
3	External Photos of EUT	Photos # 1 to 2	OK
4	Internal Photos of EUT	Photos of 1 to 6	OK
5	Cover Letters	• Letter from Ultratech for Certification Request • Letter from the Applicant to appoint Ultratech to act as an agent • Letter from the Applicant to request for Confidentiality Filing	OK OK OK
6	Attestation Statements	• Manufacturer's Declaration of Conformity (FCC DoC) for compliance with FCC Part 15, Sub. B, Class B - Computing Devices - if required	OK
7	ID Label/Location Info	• ID Label • Location of ID Label	OK
8	Block Diagrams	• Block diagrams # 1 of 1	OK
9	Schematic Diagrams	• Schematic diagrams # 3 of 3	OK
10	Parts List/Tune Up Info	OK	OK
11	Operational Description	2 of 2	OK
12	RF Exposure Info	SAR Test Report	OK
13	Users Manual	Same as Operational Description	OK

EXHIBIT 2. INTRODUCTION

2.1. SCOPE

Reference:	FCC Part 15, Subpart C, Section 15.247:1998
Title	Telecommunication - Code of Federal Regulations, CFR 47, Part 15
Purpose of Test:	To gain FCC Certification Authorization for Direct Sequence Spread Spectrum Transmitters operating in the Frequency Band 2400 - 2483.5 MHz .
Test Procedures	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
Environmental Classification:	• Residential • Light-industry, Commercial • Industry

2.2. RELATED SUBMITAL(S)/GRANT(S)

None

2.3. NORMATIVE REFERENCES

Publication	YEAR	Title
FCC CFR Parts 0-19	1999	Code of Federal Regulations – Telecommunication
ANSI C63.4	1992	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CISPR 22 & EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
CISPR 16-1		Specification for Radio Disturbance and Immunity measuring apparatus and methods
FCC Public Notice DA 00-705	2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
FCC Public Notice DA 00-1407	2000	Part 15 Unlicensed Modular Transmitter Approval

EXHIBIT 3. PERFORMANCE ASSESSMENT

3.1. CLIENT INFORMATION

INTERSIL CORPORATION
2401 Palm Bay Rd. NE
Palm Bay, Florida

APPLICANT:	
Name:	INTERSIL CORPORATION
Address:	2401 Palm Bay Rd. NE Palm Bay, Florida USA 32905
Contact Person:	Mr. Bartow Willingham Phone: 321-729-4955 Fax: 321-724-7886 e-mail: bwilli08@intersil.com

MANUFACTURER:	
Name:	INTERSIL CORPORATION
Address:	2401 Palm Bay Rd. NE Palm Bay, Florida USA 32905
Contact Person:	Mr. Bartow Willingham Phone: 321-729-4955 Fax: 321-724-7886 e-mail: bwilli08@intersil.com

3.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name	INTERSIL CORPORATION
Product Name	PRISM 2.5 PCMCIA
Model Name or Number	ISL37300P
Type of Equipment	Direct Sequence Spread Spectrum Transmitters
Input Power Supply Type	DC power from host Laptop
Primary User Functions of EUT:	Provide data communication link through air

3.3. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	▪ Mobile ▪ Base station (fixed use)
Intended Operating Environment:	▪ Residential ▪ Commercial, light industry & heavy industry
Power Supply Requirement:	DC power from host laptop
RF Output Power Rating:	45.7 mWatt peak maximum (conducted in full bandwidth) 44.7 mWatts peak maximum (EIRP in 1 MHz BW)
Operating Frequency Range:	2412 - 2462 MHz
RF Output Impedance:	50 Ohms
Channel Spacing:	5 MHz
Duty Cycle:	Continuous
6 dB Bandwidth:	11.8 MHz
Modulation Type:	Intersil Prism Chip Set: • DBPSK for 1Mb/s Data Rate • DQPSK for 2 Mb/s Data Rate • CCK for 5.5 Mb/s Data Rate • CCK for 11 Mb/s Data Rate
Chip Rate/Symbol Rate: **(or Theoretical Process Gain)**	Intersil Chip Set: ▪ 11:1 (for 1 Mb/s Data Rate) ▪ 11:1 (for 2 Mb/s Data Rate) ▪ 11:1.375+Coding Gain or 8+Coding Gain (for 5.5 Mb/s Data Rate).Note 1 ▪ 11:1.375+Coding Gain or 8+Coding Gain (for 5.5 Bb/s Data Rate).Note 1 Note 1: The theoretical Process Gain at the 5.5 Mb/s and 11 Mb/s operation with CCK modulation does not represent the actual Process Gain since the actual Total Process Gain = Process Gain + Coding Gain.
Measured Process Gain:	▪ 1 Mbps, DBPSK: 12.8 dB ▪ 2 Mbps, DQPSK: 13.8 dB ▪ 5.5 Mbps, CCK: 13.4 dB ▪ 11 Mbps, CCK: 12.8 dB
Emission Designation:	Direct Sequence Spread Spectrum
Spectral Density	3.9 mW/MHz (Power output at the antenna / bandwidth of the RF output spectrum)
Antenna Connector Type:	• Integral (the antenna component is soldered onto the radio printed circuit board and located inside the enclosure)
Antenna Gain:	2.3 dBi

3.4. LIST OF EUT'S PORTS

None

3.5. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

Ancillary Equipment # 1	
Description:	Laptop
Brand name:	Dell Latitude CSX
Model Number:	PMP
Serial Number:	TW-03018R-12800-OAD-1349

Ancillary Equipment # 2	
Description:	AC Adaptor
Brand name:	Dell
Model Number:	ADP-70EB
Serial Number:	09364U

Ancillary Equipment # 3	
Description:	Printer
Brand name:	Epson Etylus 800
Model Number:	P780B
Serial Number:	1QY1048139
Connected to EUT's Port:	DB25
Approval	FCC & CE

Ancillary Equipment # 4	
Description:	Mouse
Brand name:	Microsoft
Model Number:	PS2
Serial Number:	9751321
Connected to EUT's Port:	PS2
Approval	FCC & CE

Ancillary Equipment # 5	
Description:	Monitor
Brand name:	IBM P70
Model Number:	6554-673
Serial Number:	21-11252
Connected to EUT's Port:	DB15
Approval	FCC & CE

3.6. BLOCK DIAGRAM OF TEST SETUP

The following drawings show details of the test setup for radiated emissions measurements.

Note: For transmitter radiated emissions measurements, the peripherals such as printer, monitor are removed from the the test bench, and they are placed on the floor with the I/O cables connected to the laptop computer. This was done to maximize the transmitter radiated emissions.

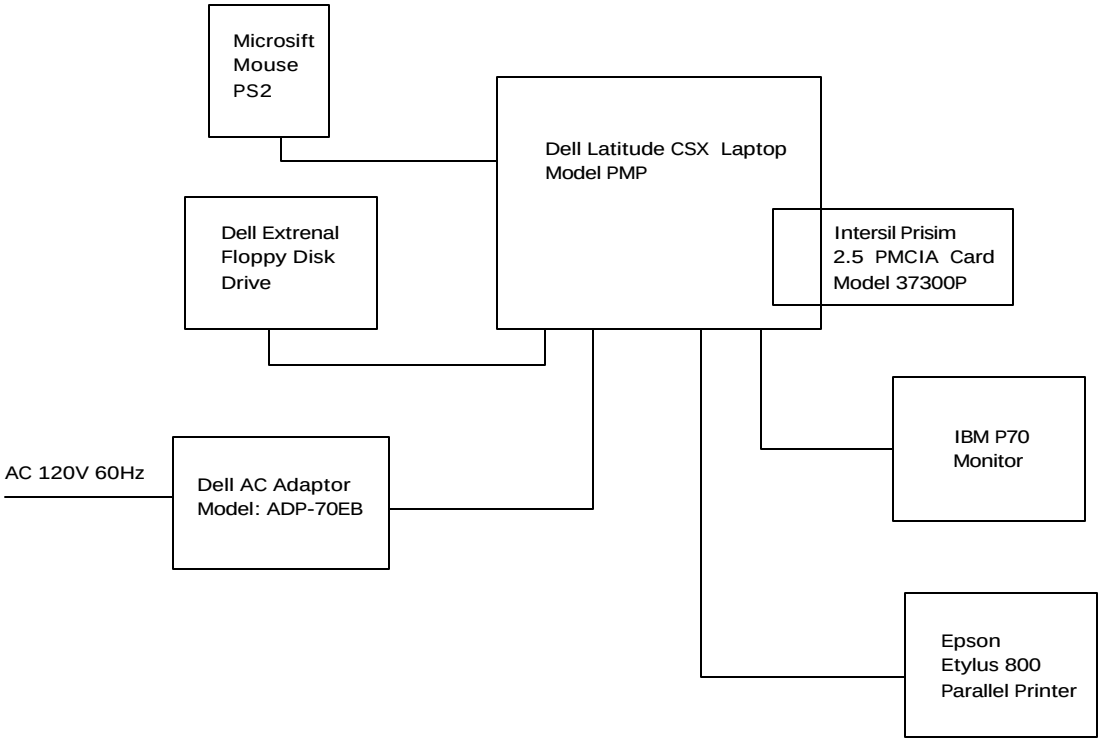


EXHIBIT 4. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

4.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power input source:	DC SUPPLY FROM A LAPTOP PC

4.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

Operating Modes:	▪ Each of lowest, middle and highest channel frequencies transmits continuously for emissions measurements. ▪ The EUT operates in normal Direct Sequence mode for occupancy duration, and frequency separation.
Special Test Software:	▪ Special software is provided by the Applicant to select and operate the EUT at each channel frequency continuously. For example, the transmitter will be operated at each of lowest, middle and highest frequencies individually continuously during testing.
Special Hardware Used:	N/A
Transmitter Test Antenna:	The EUT is tested with the antenna fitted in a manner typical of normal intended use as an integral antenna equipment.

Transmitter Test Signals:	
Frequencies: ▪ 2412 - 2462 MHz band:	Lowest, middle and highest channel frequencies tested:
Transmitter Wanted Output Test Signals: ▪ RF Power Output (measured ▪ Normal Test Modulation ▪ Modulating signal source:	 ▪ 45.7 mWatt ▪ DBPSK (1Mb/s data rate), DQPSK (2 Mb/s datarate) & CCK (5.5 & 11 Mb/s datarate) ▪ Internal

EXHIBIT 5. SUMMARY OF TEST RESULTS

5.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Powerline Conducted Emissions were performed in UltraTech's shielded room, 16'(L) by 12'(W) by 12'(H).

- Radiated Emissions were performed at the Ultratech's 3 Meter Open Field Test Site (OFTS) situated in the Town of Oakville, province of Ontario.

  The above sites have been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville Open Field Test Site has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049). Last Date of Site Calibration: May 02, 2001.

5.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC PARAGRAPH.	TEST REQUIREMENTS	COMPLIANCE (YES/NO)
Public Notice DA 00-1407	Part 15 Unlicensed Modular Transmitter Approval	Yes
15.107, 15.109	AC Power Conducted Emissions & Radiated Emissions for Receiver and Digital Circuit Portions	Yes (Note 1)
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System	Yes
15.247(b) & 1.1310	Maximum Peak Power and RF Exposure Limits	Yes
1.1307, 1.1310, 2.1091 & 2.1093	RF Exposure Limit	Yes
15.247(c)	RF Conducted Spurious Emissions at the Transmitter Antenna Terminal	Yes
15.247(c), 15.209 & 15.205	Transmitter Radiated Emissions	Yes
15.247(d)	Transmitted Power Density of a Direct Sequence Spread Spectrum System	Yes
15.247(e)	Processing Gain of Direct Sequence Spread Spectrum System	Yes. This test was performed by Intersil and attached in the a separate Exhibit 9

Note 1: The digital circuits portion of the EUT has been tested and verified to comply with FCC Part 15, Subpart B, Class B Digital Devices and Radio Receivers. Please find the FCC DoC from in Annex 6. The engineering test report can be provided upon FCC requests.

5.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

EXHIBIT 6. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

6.1. TEST PROCEDURES

This section contains test results only. Details of test methods and procedures can be found in Exhibit 8 of this report and ANSI C63-4:1992

6.2. MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document NIS 81 with a confidence level of 95%. Please refer to Exhibit 7 for Measurement Uncertainties.

6.3. MEASUREMENT EQUIPMENT USED:

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C64-3:1992, FCC 15.247 and CISPR 16-1.

6.4. ESSENTIAL/PRIMARY FUNCTIONS AS DECLARED BY THE MANUACTURER:

The essential function of the EUT is to correctly communicate data to and from radios over RF link.

6.5. UNLICENSED MODULAR TRANSMITETR APPROVAL REQUIREMENTS @ FCC PUBLIC NOTICE DA 00-1407 (JUNE 26, 2000)

In order to satisfy FCC requirements for equipment authorization for modular transmitters, the transmitters shall meet the following parameters:

	Requirements for Modular Transmitters	Manufacturer's Clarification	Laboratory's Comments
(a)	In order to be considered a transmitter module, the device must be complete RF transmitter, i.e., it must have its own reference oscillator (e.g., VCO), antenna, etc…. The only connectors to the module, if any, may be power supply and modulation/data inputs	✓ The transmitter is completed with its own reference oscillator, antenna. ✓ Only connectors provide are dc supply, data and rf ports are provided with the modular transmitter	Satisfactory
(b)	Compliance with FCC RF Exposure requirements may, in some instances, limit the output power of a module and/or the final applications in which the approved module may be employed	✓ The radio is intended for use in all applications (portable, mobile and base). It complies with SAR test with body tissue	Satisfactory
(c)	While the applicant for a device into which an authorized module is installed is not required to obtain a new authorization for the module, this does not preclude the possibility that some other form of authorization or testing may be required for the device (e.g., a WLAN into which the authorized module is installed still be authorized as PC peripheral, subject to the appropriate equipment authorization)	✓ The equipment under complies with FCC Part15, Subpart B, Class B – Unintentional radiators	Satisfactory
(d)	In the case of a modular transceiver, the modular approval policy only applies to the transmitter portion of such devices. Pursuant to section 15.101(b), the receiver portion will either be subject to Verification, or it will not be subject to any authorization requirements (unless if is a Scanning Receiver, in which case it is also subject to Certification, pursuant to Section 15.101(a)	✓ The receiver operates in the band above 960 MHz; therefore, the FCC authorization for the receiver is exempted. However test was performed and complies with FCC Part15, Sub.B – Radio Receivers	Satisfactory

	Requirements for Modular Transmitters	Manufacturer's Clarification	Laboratory's Comments
(e)	The holder of the grant of equipment authorization (Grantee) of the module is responsible for the compliance of the module in its final configuration, provided that the OEM, integrator, and /or end user has complied with all of the instructions provided by the Grantee which indicate installation and/or operating conditions necessary for compliance.	End-users must comply with the following instruction stated in the users' manual: ✓ Labeling requirement for equipment using this modular transmitter. ✓ RF Exposure Warning for compliance with FCC Rules 2.1091 and 1.1307 when the radio is used in a mobile or base system	 Required for OEM manufacturer installed this radio inside the OEM product enclosure. N/A

In order to obtain a modular transmitter approval, a cover letter requesting modular approval must be submitted and the numbered requirements identified below must be addressed in the application for equipment authorization:

	Requirements for Modular Transmitters	Manufacturer's Clarification	Laboratory's Comments
1.	The modulator transmitter must have its own RF shielding. This is intended to ensure that the module does not have to reply upon the shielding provided by the device into which it is installed in order for all modular transmitter emissions to comply with Part 15 limits. It is also intended to prevent coupling between the RF circuitry of the module and any wires or circuits in the device into which the module is installed. Such coupling may result in non-complaint operation.	✓ The modular transmitter has its own RF shielding	Satisfactory
2.	The modular transmitter must have buffered modulation/data inputs (if such inputs are provided) to ensure that the module will comply with Part 15 requirements under conditions of excessive data rates or over-modulation.	✓ The modular transmitter has buffered modulation/data inputs	Satisfactory
3.	The modular transmitter must have its own power supply regulation. This is intended to ensure that the module will comply with Part 15 requirements regardless of the design of the power supplying circuitry in the device into which the module is installed.	✓ The modular transmitter has its own power supply regulation.	Satisfactory

	Requirements for Modular Transmitters	Manufacturer's Clarification	Laboratory's Comments
4.	The modular transmitter must comply with the antenna requirements of section 15.203 and 15.204(c). The antenna must either be permanently attached or employ a "unique" antenna coupler (at all connections between the module and the antenna, including the cable). Any antenna used with the module must be approved with the module, either at the time of initial authorization or through a Class II permissive change. The "professional installation" provision of Section 15.203 may not be applied to modules.	✓ The radio complies with Rules 15.203 and 15.204(c) with permanently attached antenna.	Satisfactory
5	The modular transmitter must be tested in a stand-alone configuration, i.e., the module must not be inside another device during testing. This is intended to demonstrate that the module is capable of complying with Part 15 emission limits regardless of the device into which it is eventually installed. Unless the transmitter module will be battery powered, it must comply with the AC conducted requirements found in Section 15.207. AC or DC power lines and data input/output lines connected to the module must not contain ferrites, unless they will marketed with the module (see Section 15.27(a)). The length of these lines shall be length typical of actual use or, if that length is unknown, at least 10 centimeters to insure that there is no coupling between the case of the module and supporting equipment. Any accessories, peripherals, or support equipment connected to the module during testing shall be unmodified or commercially available (See Section 15.31(I)).	✓ The modular transmitter was tested in its only-one-way installation method to the laptop PC.	Satisfactory

6.6. COMPLIANCE WITH FCC PART 15 – GENERAL TECHNICAL REQUIREMENTS

FCC Section	FCC Rules	
15.203	Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT. The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed: • The application (or intended use) of the EUT • The installation requirements of the EUT • The method by which the EUT will be marketed	Antenna is permanently attached to and is an integral component of the EUT
15.204	Provided the information for every antenna proposed for use with the EUT: (a) type (e.g. Yagi, patch, grid, dish, etc…), (b) manufacturer and model number (c) gain with reference to an isotropic radiator	 Intergral pc Celestica 2.3 dBi

6.7. AC POWERLINE CONDUCTED EMISSIONS @ FCC PART 15, SUBPART B, PARA.15.107(A)

6.7.1. Limits

The equipment shall meet the limits of the following table:

Test Frequency Range	Test Limits	EMI Detector Used	Measuring Bandwidth
0.45 to 30 MHz	48 dBµV 61 dBµV	Quasi-Peak (Narrow band) Quasi-Peak (Broad band)	B = 10 kHz B = 10 kHz

6.7.2. Method of Measurements

Refer to Exhibit 8, Sec. 8.2 of this test report & ANSI C63-4:1992

6.7.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.5 GHz
Transient Limiter	Hewlett Packard	11947A	310701998	9 kHz – 200 MHz 10 dB attenuation
L.I.S.N.	EMCO	3825/2	89071531	9 kHz – 200 MHz 50 Ohms / 50 µH
12'x16'x12' RF Shielded Chamber	RF Shielding	…	..	…

6.7.4. Photographs of Test Setup

Refer to the Photographs #1 & #2 in Annex 2 for setup and arrangement of equipment under tests and its ancillary equipment.

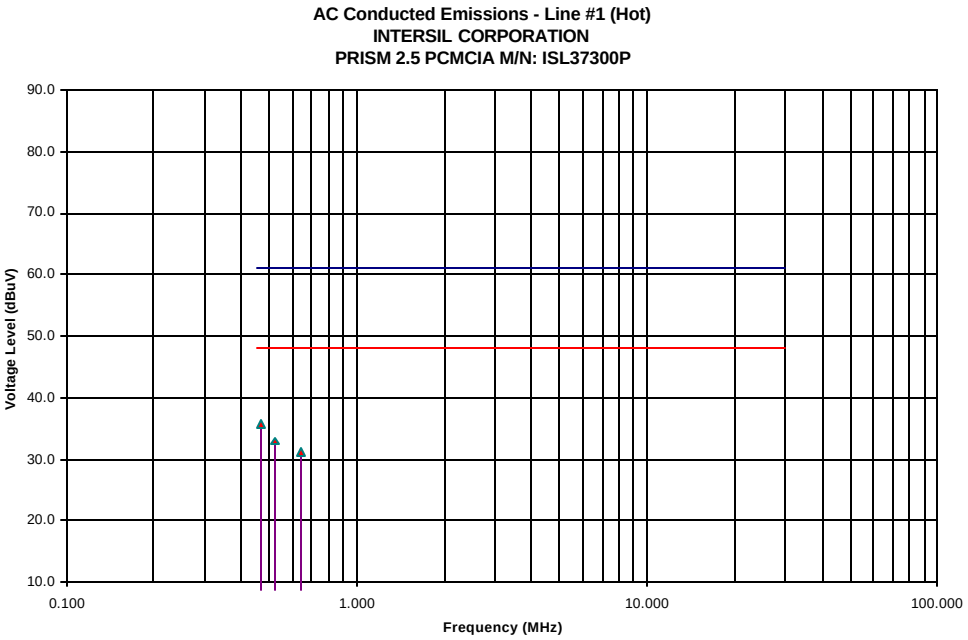
6.7.5. Test Data

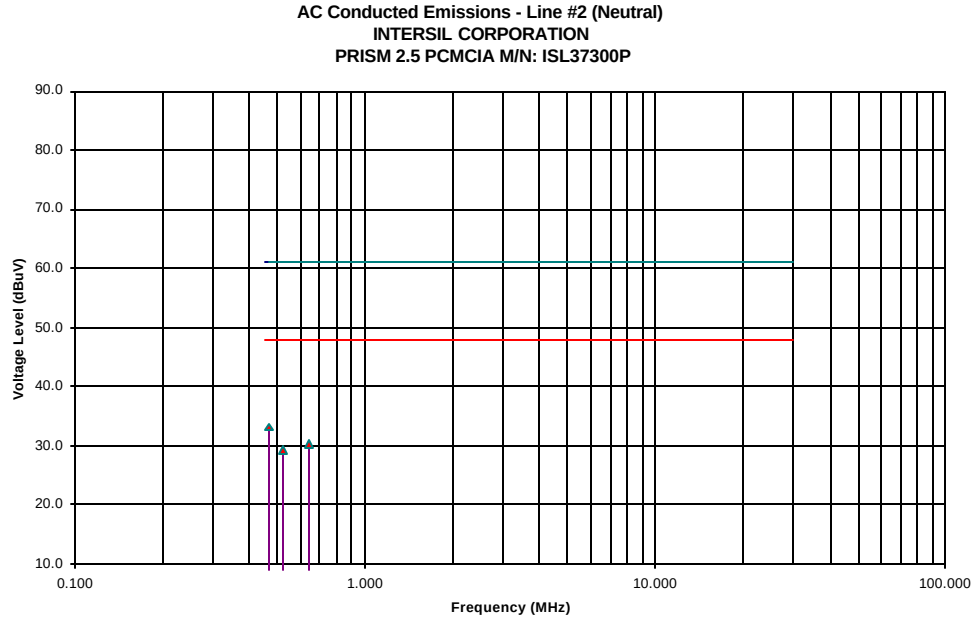
FREQUENCY (MHz)	RF LEVEL (dBuV)	RECEIVER DETECTOR (P/QP/AVG)	QP/NB LIMIT (dBuV)	QP/BB LIMIT (dBuV)	MARGIN (dB)	PASS/ FAIL	LINE TESTED (L1/L2)
0.467	35.8	QP	48.0	61.0	-12.2	PASS	L1
0.523	33.0	QP	48.0	61.0	-15.0	PASS	L1
0.640	31.3	QP	48.0	61.0	-16.7	PASS	L1
0.469	33.1	QP	48.0	61.0	-14.9	PASS	L2
0.643	30.3	QP	48.0	61.0	-17.7	PASS	L2
0.523	29.3	QP	48.0	61.0	-18.7	PASS	L2

6.7.6. Plots

The following plots graphically represent the test results recorded in the above Test Data Table.

Refer to Plots # 1 & 2 in Annex 1 actual measurement plots





6.8. 6 DB BANDWIDTH @ FCC 15.247(A)(2)

6.8.1. Limits

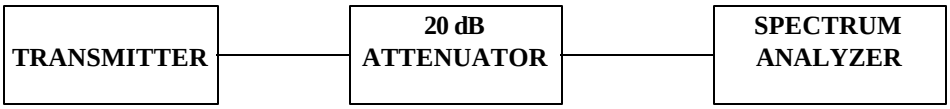
For a direct sequence spread spectrum system, the minimum 6 dB bandwidth shall be at least 500 KHz.

6.8.2. Method of Measurements

Refer to FCC 15.247(c) & ANSI C63-4:1992

The transmitter output was connected to the spectrum analyzer through an attenuator. the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 30 KHz RBW, VBW = 100 KHz,. The 6 dB bandwidth was measured and recorded.

6.8.3. Test Arrangement



6.8.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.5 GHz

6.8.5. Plots

Please refer to Plots # 3 to 14 Annex 1 for Measurements data

6.8.6. Test Data

CHANNEL FREQUENCY (MHz)	MAXIMUM DATA RATE (M-bit/second)	MODULATION	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
2412	1	DBPSK	11.3	0.5	PASS
2437	1	DBPSK	9.8	0.5	PASS
2462	1	DBPSK	9.9	0.5	PASS
2412	2	DQPSK	11.1	0.5	PASS
2437	2	DQPSK	11.3	0.5	PASS
2462	2	DQPSK	9.8	0.5	PASS
2412	5.5	CCK	11.5	0.5	PASS
2437	5.5	CCK	10.4	0.5	PASS
2462	5.5	CCK	10.4	0.5	PASS
2412	11	CCK	11.8	0.5	PASS
2437	11	CCK	10.1	0.5	PASS
2462	11	CCK	10.9	0.5	PASS

6.9. PEAK OUTPUT POWER & EFFECTIVE RADIATED POWER (EIRP) @ FCC 15.247(B)

6.9.1. Limits

- **FCC 15.247(b)(1):** Maximum peak output power of the transmitter shall not exceed 1 Watt.
- **FCC 15.247(b)(3):** If the antenna of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- **FCC 15.247(b)(3)(i):** Systems operating in the 2400 - 2483.5 MHz band that are used exclusively for fixed, **point-to-point operations** may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduce by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi..

De Facto EIRP Limit:

Describe how the EUT complies with the de facto EIRP limit for every antenna proposes for use with the EUT. This includes those devices that will be used in point-to-point applications. If the peak power, as measured above, must be reduced so that the de facto EIRP limit may be met for a particular antenna, described exactly how much it will be reduced for that antenna. If the minimum length of cable which will always be used, the type of cable, and its loss, in dB per unit length, for the frequency of the emission. The limit is specified in one of the subparagraphs of this section. Also, specify who will be responsible for ensuring that compliant operation is maintained for every antenna that will be used with EUT.

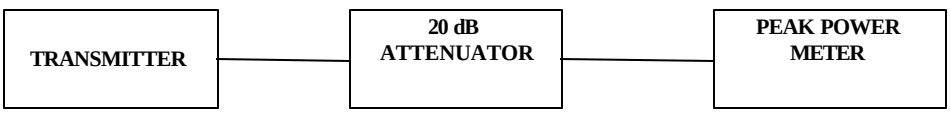
Point-to-Point Operation:

- If the EIRP relaxation for point-to-point operation is proposed for any particular antenna, describe who will be responsible for ensuring that the EUT is only used in such an application.
- Fixed, point-to-point operation, as used in 2400-2483.5 MHz and 5725-5850 MHz bands, excludes the use of the following:
  - Point-to-multipoint systems
  - Omnidirectional applications
  - Multiple co-located intentional radiators transmitting the same information.
- The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that *the system is used exclusively for fixed, point-to-point operations.* The instruction manual furnished with the intentional radiators shall contain language in the installation instructions informing the operator and the installer of this reponsibilty.

6.9.2. Method of Measurements

Refer to Exhibit 8, Sec. 8.3 of this test report, FCC 15.247(b)(1)&(3), ANSI C63-4:1992

6.9.3. Test Arrangement



6.9.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8546A	…	9 kHz to 5.6 GHz with built-in 30 dB Gain Pre-selector, QP, Average & Peak Detectors.
Microwave Amplifier	Hewlett Packard	HP 83017A		1 GHz to 26.5 GHz
Biconilog Antenna	EMCO	3142	10005	30 MHz to 2 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz
Horn Antenna	EMCO	3155	9911-5955	1 GHz – 18 GHz
RF Signal Generator	Hewlett Packard	HP 83752B	3610A00457	0.01 – 20 GHz

6.9.5. Test Data

Duty cycle: Continuous

PEAK POWER MEASUREMENTS

Transmitter Channel	Frequency (MHz)	(full bandwidth) Peak Power at Antenna Terminals (dBm)	Antenna Gain (dBi)	(full bandwidth) Calculated Peak EIRP (dBm)	Limit (dBm)
Lowest	2412	16.4	2.3	18.7	30.0
Middle	2437	16.4	2.3	18.7	30.0
Highest	2462	16.6	2.3	18.9	30.0

EIRP MEASUREMENTS – SUBSTITUTION METOD

Frequency (MHz)	E-Field E1 in 1 MHz BW @ 3m (dBuV/m)	Antenna Polarization (V/H)	Peak Power from Signal GEN. In 1MHz BW Ps (dBm)	Substitution Antenna Gain G (dBi)	** (Note 1) ** Measured Peak EIRP = Ps + G (dBm)	EIRP LIMIT (dBm)
2412	112.1	V	7.8	8.2	16.0	30.0
2412	112.7	H	7.8	8.2	16.0	30.0
2437	111.1	V	6.8	8.2	15.0	30.0
2437	112.8	H	7.9	8.2	16.1	30.0
2462	112.4	V	8.3	8.2	16.5	30.0
2462	113.7	H	8.1	8.2	16.3	30.0

Remark:

(1) The measured EIRP is measured in 1 MHz BW using an EMI receiver and the calculated EIRP is based on full-bandwidth measurement of the conducted power using a peak power meter. Therefore, they do not quite match in comparison.

6.10. RF EXPOSURE REQUIRMENTS @ FCC 15.247(b)(4) & 2.1093

Evaluation of RF Exposure Compliance Requirements	
RF Exposure Requirements	**Compliance with FCC Rules**
SAR Tests for Portable Transmitters	
• Body Tissue	• Comply with SAR limits with body tissue, please refer to SAR test report with maximum SAR level < 0.01 W/Kg (our measurement threshold).
• Brain Tissue	• Not applicable

Please refer to the attached SAR Test Report, Our File No.: CLS-061SAR, for detailed information.

6.11. TRANSMITTER BAND-EDGE & SPURIOUS EMISSIONS (CONDUCTED), FCC CFR 47, PARA. 15.247(C)

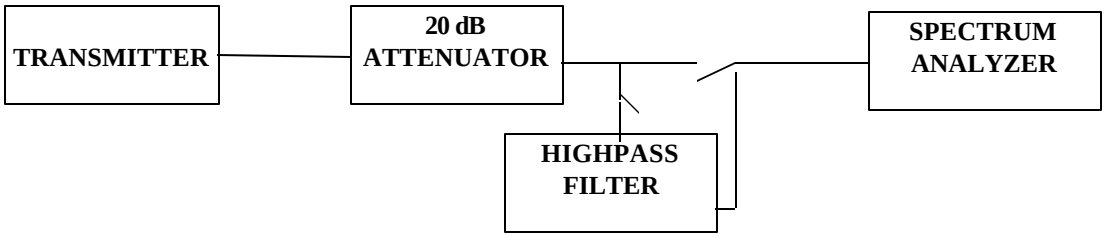
6.11.1. Limits

In any 100 KHz bandwidth outside the operating frequency band, the radio frequency power that is produced by modulation products of the spreading sequence, the information sequence and the carrier frequency shall be at least 20 dB below that in any 100 KHz bandwidth within the band that contains the highest level of the desired power.

6.11.2. Method of Measurements

Refer to Exhibit 8, Sec. 8.4 of this test report, FCC 15.247(c) & ANSI C63-4:1992

6.11.3. Test Arrangement



6.11.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.5 GHz

6.11.5. Plots

Please refer to Plots # 15 through 23 in Annex 1 for Measurements data

6.11.6. Test Data

Remarks:

(1) There was no difference in rf spurious emissions at different data rate and modulation scheme based on our pre-scans.
(2) The rf output with maximum data rate (11 Mb/s CCK) was performed and recorded as follows:

6.11.6.1. Lowest Frequency (2412 MHz, 11 Mb/s, CCK)

FREQUENCY (MHz)	RF LEVEL in 100 kHz BW (dBm)	DETECTOR USED (PEAK/QP)	LIMIT (dBm)	MARGIN (dB)	PASS/ FAIL
2412.00	5.9	PEAK	30.0	-26.0	PASS
2037.73	-44.1	PEAK	-14.1	-30.0	PASS
4075.46	-74.3	PEAK	-14.1	-60.2	PASS
8145.46	-60.4	PEAK	-14.1	-46.3	PASS
4824.00	-73.3	PEAK	-14.1	-59.2	PASS
6487.46	-71.1	PEAK	-14.1	-57.0	PASS
The emissions were scanned from 10 MHz to 25 GHz and all emissions less 60 dB below the limits were recorded.					

6.11.6.2. Middle Frequency (2437 MHz, 11 Mb/s, CCK)

FREQUENCY (MHz)	RF LEVEL in 100 kHz BW (dBm)	DETECTOR USED (PEAK/QP)	LIMIT (dBm)	MARGIN (dB)	PASS/ FAIL
2437.00	5.5	PEAK	30.0	-24.5	PASS
2062.73	-44.1	PEAK	-14.5	-29.6	PASS
4125.46	-70.7	PEAK	-14.5	-56.2	PASS
8250.92	-59.9	PEAK	-14.5	-45.4	PASS
4874.00	-74.2	PEAK	-14.5	-59.7	PASS
6562.46	-59.9	PEAK	-14.5	-45.4	PASS
The emissions were scanned from 10 MHz to 25 GHz and all emissions less 60 dB below the limits were recorded.					

6.11.6.3. Highest Frequency (2462 MHz, 11 Mb/s, CCK)

FREQUENCY (MHz)	RF LEVEL in 100 kHz BW (dBm)	DETECTOR USED (PEAK/QP)	LIMIT (dBm)	MARGIN (dB)	PASS/ FAIL
2462.00	5.8	PEAK	30.0	-24.2	PASS
2087.73	-43.8	PEAK	-14.2	-29.6	PASS
4175.46	-72.7	PEAK	-14.2	-58.5	PASS
8350.92	-59.8	PEAK	-14.2	-45.6	PASS
4924.00	-75.0	PEAK	-14.2	-60.8	PASS

The emissions were scanned from 10 MHz to 25 GHz and all emissions less 60 dB below the limits were recorded.

6.12. SPURIOUS EMISSIONS (RADIATED @ 3 METERS), FCC CFR 47, PARA. 15.247(C), 15.209 & 15.205

6.12.1. Limits

In any 100 KHz bandwidth outside the operating frequency band, the radio frequency power that is produced by modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 KHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in @ 15.209(a), which lesser attenuation.

All other emissions inside restricted bands specified in @ 15.205(a) shall not exceed the general radiated emission limits specified in @ 15.209(a)

Remarks:

- Applies to harmonics/spurious emissions that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209.
- **@ FCC CFR 47, Para. 15.237(c)** - The emission limits as specified above are based on measurement instrument employing an average detector. The provisions in **@15.35** for limiting peak emissions apply.

FCC CFR 47, Part 15, Subpart C, Para. 15.205(a) - Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	162.0125 - 167.17	2310 - 2390	9.3 - 9.5
0.49 – 0.51	167.72 - 173.2	2483.5 - 2500	10.6 - 12.7
2.1735 - 2.1905	240 - 285	2655 - 2900	13.25 - 13.4
8.362 - 8.366	322 - 335.4	3260 - 3267	14.47 - 14.5
13.36 - 13.41	399.9 - 410	3332 - 3339	14.35 - 16.2
25.5 – 25.67	608 - 614	3345.8 - 3358	17.7 - 21.4
37.5 – 38.25	960 - 1240	3600 - 4400	22.01 - 23.12
73 - 75.4	1300 - 1427	4500 - 5250	23.6 - 24.0
108 – 121.94	1435 - 1626.5	5350 - 5460	31.2 - 31.8
123 – 138	1660 - 1710	7250 - 7750	36.43 - 36.5
149.9 – 150.05	1718.8 - 1722.2	8025 - 8500	Above 38.6
156.7 – 156.9	2200 - 2300	9000 - 9200	

FCC CFR 47, Part 15, Subpart C, Para. 15.209(a)
-- Field Strength Limits within Restricted Frequency Bands --

FREQUENCY (MHz)	FIELD STRENGTH LIMITS (microvolts/m)	DISTANCE (Meters)
0.009 - 0.490	2,400 / F (KHz)	300
0.490 - 1.705	24,000 / F (KHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

6.12.2. Method of Measurements

Refer to Exhibit 8, Sec. 8.4 of this test report and **ANSI 63.4-1992, Para. 8** for detailed radiated emissions measurement procedures.

The following measurement procedures were also applied:

- Applies to harmonics/spurious that fall in the restricted bands listed in Section 15.205. the maximum permitted average field strength is listed in Section 15.209. A Pre-Amp and highpass filter are used for this measurement.
- For measurement below 1 GHz, set RBW = 100 KHz, VBW $\geq$ 100 KHz, SWEEP=AUTO.
- For measurement above 1 GHz, set RBW = 1 MHz, VBW = 1 MHz (Peak) & VBW = 10 Hz (Average), SWEEP=AUTO.
- If the emission is pulsed, modified the unit for continuous operation, then use the settings above for measurements, then correct the reading by subtracting the peak-average correction factor derived from the appropriate duty cycle calculation. See Section 15.35(b) and (c).

6.12.3. Test Arrangement

Please refer to Test Arrangement in Sec. 5.5.3 for details of test setup for emission measurements.

6.12.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Advantest	R3271	15050203	100 Hz to 32 GHz with external mixer for frequency above 32 GHz
Microwave Amplifier	Hewlett Packard	HP 83017A		1 GHz to 26.5 GHz
Biconilog Antenna	EMCO	3143	1029	20 MHz to 2 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz
Horn Antenna	EMCO	3160-09	..	18 GHz – 26.5 GHz
Horn Antenna	EMCO	3160-10	..	26.5 GHz – 40 GHz
Mixer	Tektronix	118-0098-00	..	18 GHz – 26.5 GHz
Mixer	Tektronix	119-0098-00	..	26.5 GHz – 40 GHz

6.12.5. Photographs of Test Setup

Refer to the Photographs #3 & #4 in Annex 2 for setup and arrangement of equipment under tests and its ancillary equipment.

6.12.6. Plots

Refer to Plot # 48 – 54 out-of-band radiated emissions around the permitted band 2.4-2.4835 GHz.

6.12.7. Test Data

Remarks:

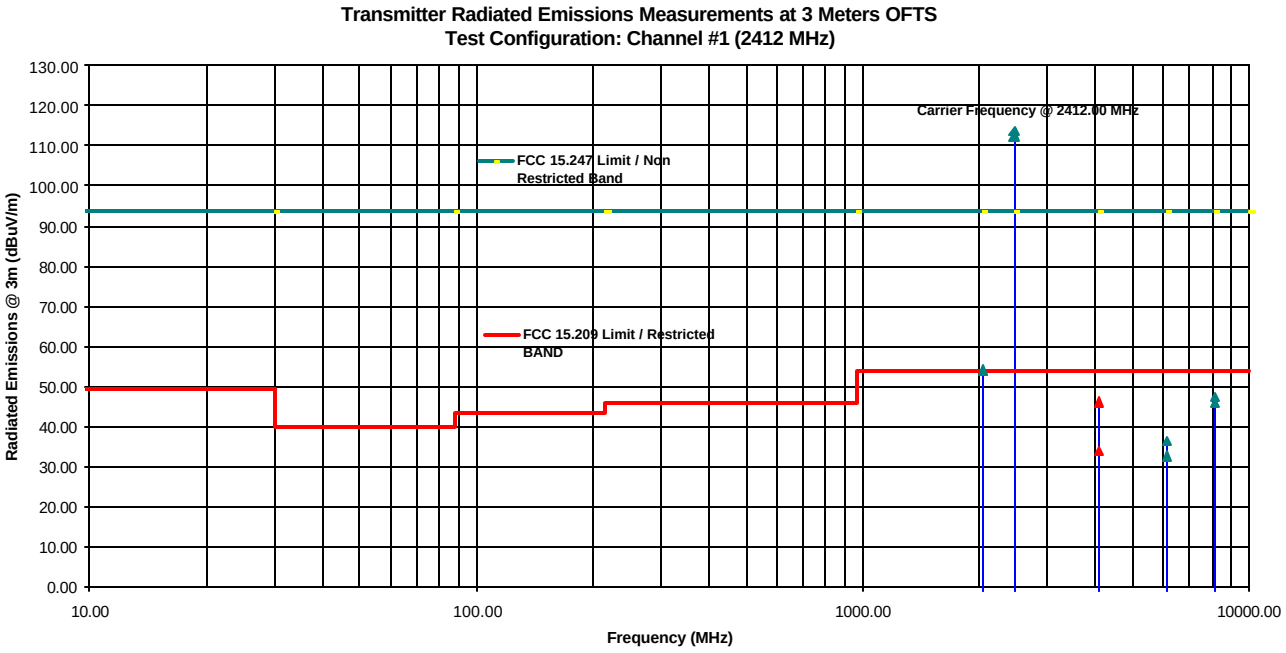
(3) There was no difference in rf spurious emissions at different data rate and modulation scheme based on our pre-scans.

(4) The rf output with maximum data rate (11 Mb/s CCK) was performed and recorded as follows:

6.12.7.1. Lowest Frequency (2412 MHz, 11 Mb/s, CCK)

FREQUENCY (MHz)	PEAK LEVEL in 1 MHz BW (dBuV/m)	AVG LEVEL in 1 MHz BW (dBuV/m)	PLANE (H/V)	15.209 (dBuV/m)	15.247 (dBuV/m)	MARGIN (dB)	PASS/ FAIL
2037.73	54.56	54.20	V	54.0	93.7	-39.5	PASS
2037.73	54.28	53.80	H	54.0	93.7	-39.9	PASS
2462.00	112.44	--	V	--	--		--
2462.00	113.66	--	H	--	--		--
4075.46	47.00	46.11	V	54.0	93.7	-7.9	PASS*
4075.46	42.03	33.78	H	54.0	93.7	-20.2	PASS*
6113.19	37.09	32.72	V	54.0	93.7	-60.9	PASS
6113.19	37.19	36.53	H	54.0	93.7	-57.1	PASS
8150.93	48.19	45.90	V	54.0	93.7	-8.1	PASS*
8150.93	49.03	47.52	H	54.0	93.7	-6.5	PASS*

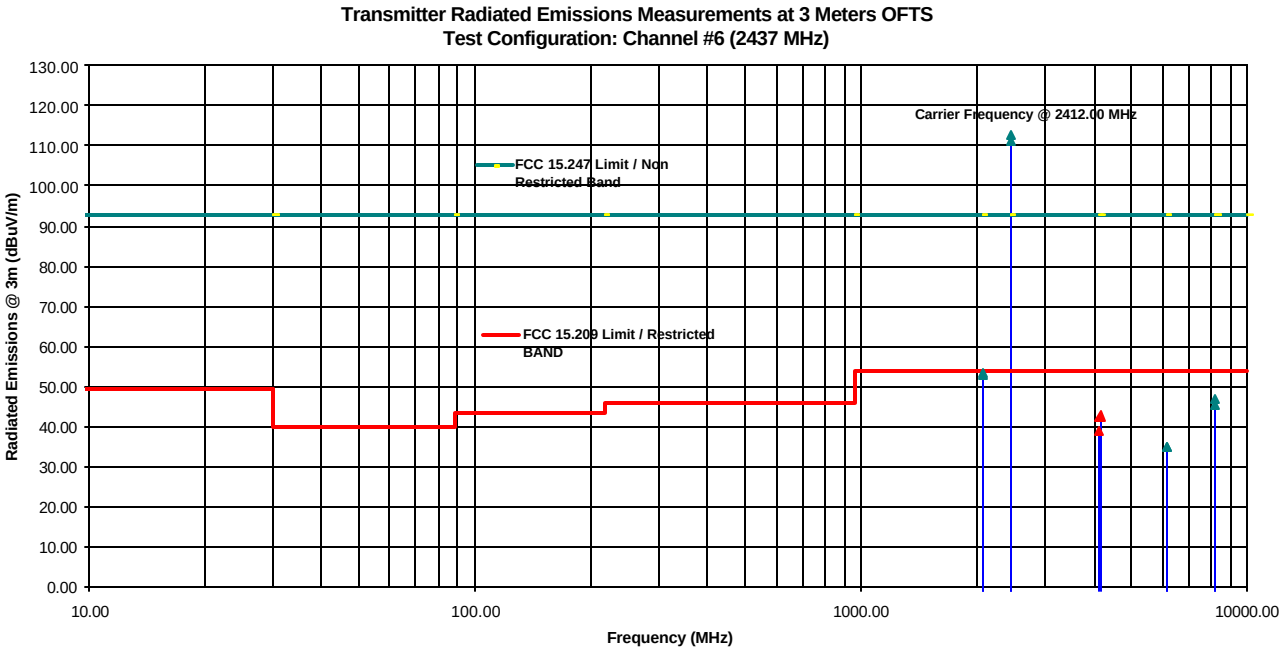
The emissions were scanned from 10 MHz to 25 GHz and all emissions less 60 dB below the limits were recorded.
* Use FCC Limit @ 15.209 for frequency in restricted bands.



6.12.7.2. Lowest Frequency (2437 MHz, 11 Mb/s, CCK)

FREQUENCY (MHz)	PEAK LEVEL in 1 MHz BW (dBuV/m)	AVG LEVEL in 1 MHz BW (dBuV/m)	PLANE (H/V)	15.209 (dBuV/m)	15.247 (dBuV/m)	MARGIN (dB)	PASS/ FAIL
2062.73	54.06	53.37	V	54.0	92.8	-39.4	PASS
2062.73	53.28	52.78	H	54.0	92.8	-40.0	PASS
2437.00	111.09	--	V	--	--		--
2437.00	112.75	--	H	--	--		--
4149.54	43.94	42.66	V	54.0	92.8	-11.3	PASS*
4125.46	39.78	38.90	H	54.0	92.8	-15.1	PASS*
6188.19	36.97	34.87	V	54.0	92.8	-57.9	PASS
6188.19	37.97	35.06	H	54.0	92.8	-57.7	PASS
8250.92	48.78	45.50	V	54.0	92.8	-8.5	PASS*
8250.92	48.84	46.98	H	54.0	92.8	-7.0	PASS*

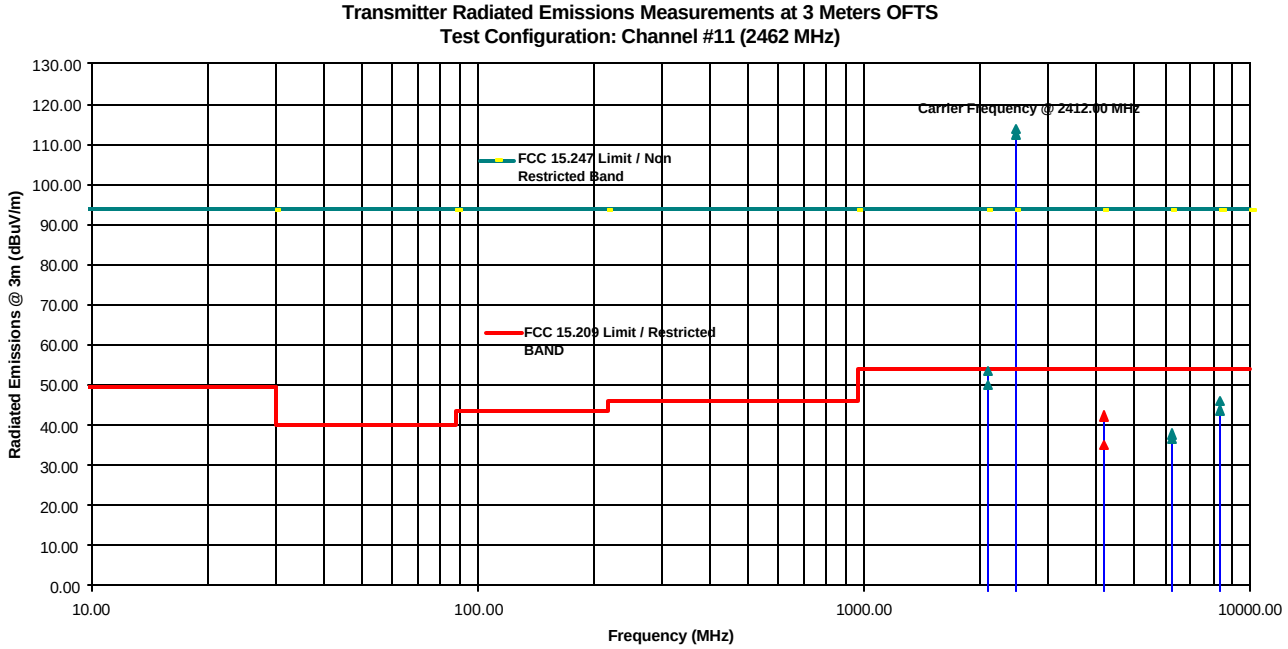
The emissions were scanned from 10 MHz to 25 GHz and all emissions less 40 dB below the limits were recorded.
* Use FCC Limit @ 15.209 for frequency in restricted bands.



6.12.7.3. Lowest Frequency (2462 MHz, 11 Mb/s, CCK)

FREQUENCY (MHz)	PEAK LEVEL in 1 MHz BW (dBuV/m)	AVG LEVEL in 1 MHz BW (dBuV/m)	PLANE (H/V)	15.209 (dBuV/m)	15.247 (dBuV/m)	MARGIN (dB)	PASS/ FAIL
2087.73	50.72	50.10	V	54.0	93.7	-43.6	PASS
2087.73	54.31	53.44	H	54.0	93.7	-40.2	PASS
2462.00	112.44	112.44	V	54.0	93.7		PASS
2462.00	113.66	113.66	H	54.0	93.7		PASS
4175.46	43.47	42.31	V	54.0	93.7	-11.7	PASS*
4175.46	38.19	35.17	H	54.0	93.7	-18.8	PASS*
6263.19	40.97	37.88	V	54.0	93.7	-55.8	PASS
6263.19	39.44	36.53	H	54.0	93.7	-57.1	PASS
8350.92	46.81	43.73	V	54.0	93.7	-10.3	PASS *
8350.92	48.16	46.16	H	54.0	93.7	-7.8	PASS *

The emissions were scanned from 10 MHz to 25 GHz and all emissions less 40 dB below the limits were recorded.
* Use FCC Limit @ 15.209 for frequency in restricted bands.



6.13. TRANSMITTED POWER DENSITY OF A DSSS SYSTEM, FCC CFR 47, PARA. 15.247(D)

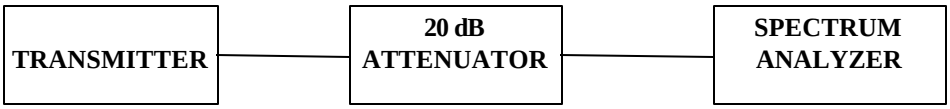
6.13.1. Limits

For a direct sequence system, the transmitted power density average over any 1 second interval shall not be greater than 8 dBm in any 3 KHz bandwidth within this band.

6.13.2. Method of Measurements

Refer to Exhibit 8, Sec. 8.5 of this test report for detailed measurement procedures

6.13.3. Test Arrangement



6.13.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.5 GHz

6.13.5. Plots

Refer to Plots # 24 to 47 Annex 2 Section 10.5 for Measurement Plots

6.13.6. Test Data

CHANNEL Number	CHANNEL FREQUENCY (MHz)	DATA RATE/ MODULATION	RF POWER LEVEL IN 3 KHz BW (dBm)	LIMIT (dBm)	MARGIN (dB)	COMMENTS (PASS/FAIL)
1	2412	1 Mb/s, DBPSK	-12.0	8.0	-20.0	PASS
1	2412	2 Mb/s, DQPSK	-7.1	8.0	-15.1	PASS
1	2412	5.5 Mbps CCK	-8.1	8.0	-16.1	PASS
1	2412	11 Mbps CCK	-7.6	8.0	-15.6	PASS
6	2437	1 Mb/s, DBPSK	-12.0	8.0	-20.00	PASS
6	2437	2 Mb/s, DBPSK	-7.0	8.0	-15.0	PASS
6	2437	5.5 Mbps CCK	-8.2	8.0	-16.2	PASS
6	2437	11 Mbps CCK	-7.9	8.0	-15.9	PASS
11	2462	1 Mb/s, DBPSK	-8.0	8.0	-16.0	PASS
11	2462	2 Mb/s, DQPSK	-7.7	8.0	-15.7	PASS
11	2462	5.5 Mbps CCK	-8.34	8.0	-16.34	PASS
11	2462	11 Mbps CCK	-6.94	8.0	14.94	PASS

6.14. PROCESSING GAIN OF A DIRECT SEQUENCE SPREAD SPECTRUM, FCC CFR 47, PARA. 15.247(E)

6.14.1. Limits

The processing gain of a direct sequence system shall be at least 10 dB. The processing gain shall be determined from the ratio in dB of the signal-to-noise ratio with the system spreading code turned off to the signal-to-noise ratio with the system spreading code turned on, as measured at the demodulated output of the receiver.

6.14.2. Method of Measurements

Theory and Measurement Procedures are described in Sec. 8.7 of Exhibit 8

========== INTERSIL TEST REPORT & STATEMENT ==========

Certification Report on Compliance with Respect of FCC CFR 47, Para. 15.247(e) Measurement of Processing Gain of Direct Sequence Spread Spectrum

Product: Intersil ISL37400M Rev C WLAN MiniPCI

Tested by: Intersil Corporation
2401 Palm Bay Road NE
Palm Bay, FL 32905

Prepared by: Douglas J. Kalcik, Staff Engineer
Phone (321) 729-4993
FAX (321 724-7886
e-mail: dkalcik@intersil.com

Date: June 13, 2001

ENGINEERING SUMMARY AND CERTIFICATION

This report contains the results of the engineering evaluation performed on an Intersil Wireless LAN PC Card, Model ISL37400M Rev C. This tests were carried out in accordance with FCC CFR 47, Para. 15.247(e).

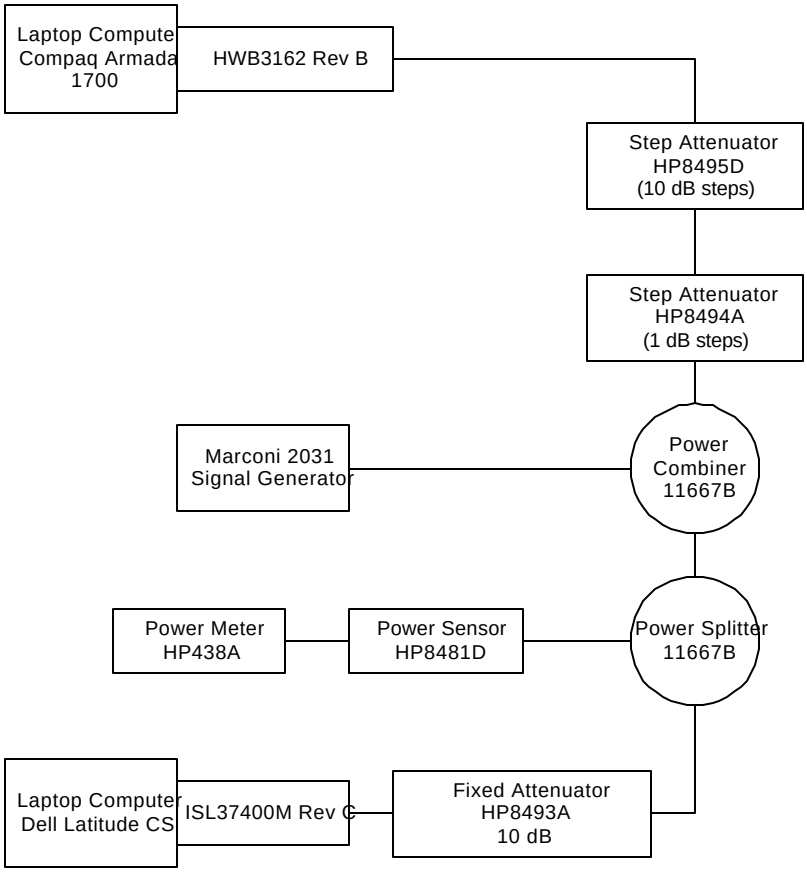
Douglas J. Kalcik is a Wireless Applications Staff Engineer at Intersil Corporation. Intersil is a new independent company as of August 13, 1999, previously known as Harris Semiconductor. Douglas received a BSEE from the University of South Florida, Tampa in 1987. He received his MSEE in Microwave Theory in 1994 also from the University of South Florida. Prior to joining Intersil in 2000, Douglas was the Senior RF Engineer with Terion, Inc. for 2 years. His career has spanned over 13 years, 10 years in the Defense Industry secure communications.

I certify that this data was taken by me or at my direction and to the best of my knowledge and belief, is true and accurate. Based on the test results, it is certified that the product meets the requirements as set forth in the above specifications.

Submitted by: Douglas J. Kalcik_____ Date:_____

6.14.3. Test Equipment

- Hewlett Packard Spectrum Analyzer, Model HP8593E
- Marconi Signal Generator, Model 2031
- Hewlett Packard Power Meter, HP438A
- Hewlett Packard Power Sensor
- Hewlett Packard Attenuators
- Hewlett Packard Step Attenuator
- Hewlett Packard Step Attenuator
- Hewlett Packard Power Splitter
- IBM I-Book Computer
- Compact Laptop Computer



6.14.4. Test Data

Environmental Conditions: Room Temperature and Humidity: 25◦C and 50%

Power Input: DC power from a laptop computer.

Theoretical Calculation: The use of 8% Frame Error Rate (FER) or packet Error Rate (PER) as a substitute for the recommended BER and the ideal signal to noise ratio per symbol (Es/No) is derived in the attached document "Testing for compliance with FCC rules 15-247(e)", by Carl Andren and "Theoretical BER curves for the IEEE 1 and 2 MBPS modulations" by Carl Andren.

Engineering Summary: Processing Gain Results Summary

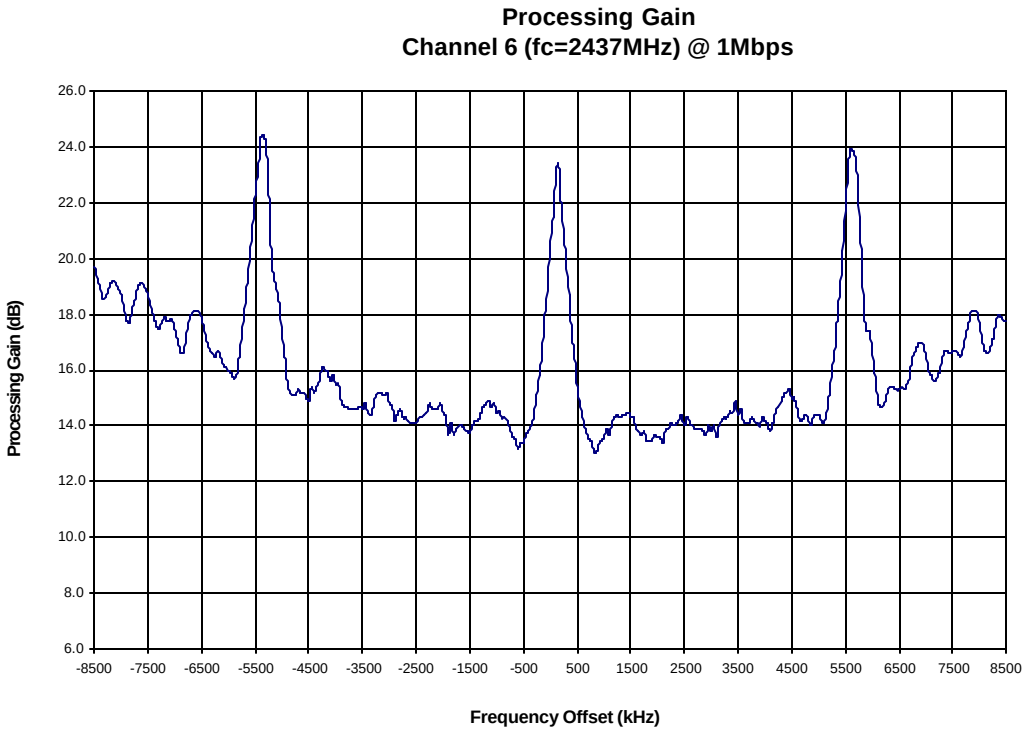
Channel Frequency (MHz)	Data Rate (MBPS)	Processing Gain (dB) After discarding 20% of worst measurements
2437	1	12.8
24.37	2	13.8
2437	5.5	13.4
2437	11	12.8

6.14.4.1. Test Configuration #1: DBPSK, 1Mbps

Chip Set: Chip set HWB3163-EVAL PRISM II™ 11 Mbps
Data Modulation: DBPSK
Data Rate or Bit Rate: 1 Mb/s,
Symbol Rate: 1 MS/s
Chip Rate: 11 MC/s
Chip Rate /Symbol Rate: 11:1

Theoretical Process Gain = Chip Rate/Symbol Rate = 11 dB

Measured Minimum Process Gain = 12.8 dB (after discarding 20% of worst measurements.)



DBPSK, 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2428.50	19.7	10.3	7.4	2.0	-52.5	<=8.0
2428.55	19.3	10.3	7.0	2.0	-52.9	<=8.0
2428.60	19.0	10.3	6.7	2.0	-53.2	<=8.0
2428.65	18.6	10.3	6.3	2.0	-53.6	<=8.0
2428.70	18.6	10.3	6.3	2.0	-53.6	<=8.0
2428.75	18.8	10.3	6.5	2.0	-53.4	<=8.0
2428.80	19.1	10.3	6.8	2.0	-53.1	<=8.0
2428.85	19.2	10.3	6.9	2.0	-53.0	<=8.0
2428.90	19.1	10.3	6.8	2.0	-53.1	<=8.0
2428.95	18.9	10.3	6.6	2.0	-53.3	<=8.0
2429.00	18.7	10.3	6.4	2.0	-53.5	<=8.0
2429.05	18.2	10.3	5.9	2.0	-54.0	<=8.0
2429.10	17.8	10.3	5.5	2.0	-54.4	<=8.0
2429.15	17.7	10.3	5.4	2.0	-54.5	<=8.0
2429.20	18.2	10.3	5.9	2.0	-54.0	<=8.0
2429.25	18.5	10.3	6.2	2.0	-53.7	<=8.0
2429.30	18.9	10.3	6.6	2.0	-53.3	<=8.0
2429.35	19.1	10.3	6.8	2.0	-53.1	<=8.0
2429.40	19.1	10.3	6.8	2.0	-53.1	<=8.0
2429.45	18.9	10.3	6.6	2.0	-53.3	<=8.0
2429.50	18.7	10.3	6.4	2.0	-53.5	<=8.0
2429.55	18.3	10.3	6.0	2.0	-53.9	<=8.0
2429.60	18.0	10.3	5.7	2.0	-54.2	<=8.0
2429.65	17.6	10.3	5.3	2.0	-54.6	<=8.0
2429.70	17.5	10.3	5.2	2.0	-54.7	<=8.0
2429.75	17.7	10.3	5.4	2.0	-54.5	<=8.0
2429.80	17.9	10.3	5.6	2.0	-54.3	<=8.0
2429.85	17.8	10.3	5.5	2.0	-54.4	<=8.0
2429.90	17.8	10.3	5.5	2.0	-54.4	<=8.0
2429.95	17.8	10.3	5.5	2.0	-54.4	<=8.0
2430.00	17.5	10.3	5.2	2.0	-54.7	<=8.0
2430.05	17.1	10.3	4.8	2.0	-55.1	<=8.0
2430.10	16.7	10.3	4.4	2.0	-55.5	<=8.0
2430.15	16.6	10.3	4.3	2.0	-55.6	<=8.0
2430.20	17.1	10.3	4.8	2.0	-55.1	<=8.0
2430.25	17.6	10.3	5.3	2.0	-54.6	<=8.0
2430.30	18.0	10.3	5.7	2.0	-54.2	<=8.0
2430.35	18.1	10.3	5.8	2.0	-54.1	<=8.0
2430.40	18.1	10.3	5.8	2.0	-54.1	<=8.0
2430.45	18.1	10.3	5.8	2.0	-54.1	<=8.0

2430.50	17.8	10.3	5.5	2.0	-54.4	<=8.0
2430.55	17.5	10.3	5.2	2.0	-54.7	<=8.0
2430.60	17.0	10.3	4.7	2.0	-55.2	<=8.0
2430.65	16.7	10.3	4.4	2.0	-55.5	<=8.0
2430.70	16.6	10.3	4.3	2.0	-55.6	<=8.0
2430.75	16.5	10.3	4.2	2.0	-55.7	<=8.0
2430.80	16.7	10.3	4.4	2.0	-55.5	<=8.0
2430.85	16.5	10.3	4.2	2.0	-55.7	<=8.0
2430.90	16.2	10.3	3.9	2.0	-56.0	<=8.0
2430.95	16.1	10.3	3.8	2.0	-56.1	<=8.0
2431.00	16.0	10.3	3.7	2.0	-56.2	<=8.0
2431.05	15.9	10.3	3.6	2.0	-56.3	<=8.0
2431.10	15.7	10.3	3.4	2.0	-56.5	<=8.0
2431.15	15.8	10.3	3.5	2.0	-56.4	<=8.0
2431.20	16.5	10.3	4.2	2.0	-55.7	<=8.0
2431.25	17.3	10.3	5.0	2.0	-54.9	<=8.0
2431.30	18.2	10.3	5.9	2.0	-54.0	<=8.0
2431.35	19.1	10.3	6.8	2.0	-53.1	<=8.0
2431.40	20.2	10.3	7.9	2.0	-52.0	<=8.0
2431.45	21.1	10.3	8.8	2.0	-51.1	<=8.0
2431.50	22.3	10.3	10.0	2.0	-49.9	<=8.0
2431.55	23.1	10.3	10.8	2.0	-49.1	<=8.0
2431.60	24.3	10.3	12.0	2.0	-47.9	<=8.0
2431.65	24.4	10.3	12.1	2.0	-47.8	<=8.0
2431.70	24.1	10.3	11.8	2.0	-48.1	<=8.0
2431.75	22.4	10.3	10.1	2.0	-49.8	<=8.0
2431.80	20.0	10.3	7.7	2.0	-52.2	<=8.0
2431.85	19.3	10.3	7.0	2.0	-52.9	<=8.0
2431.90	18.9	10.3	6.6	2.0	-53.3	<=8.0
2431.95	18.3	10.3	6.0	2.0	-53.9	<=8.0
2432.00	17.3	10.3	5.0	2.0	-54.9	<=8.0
2432.05	16.5	10.3	4.2	2.0	-55.7	<=8.0
2432.10	15.5	10.3	3.2	2.0	-56.7	<=8.0
2432.15	15.2	10.3	2.9	2.0	-57.0	<=8.0
2432.20	15.1	10.3	2.8	2.0	-57.1	<=8.0
2432.25	15.1	10.3	2.8	2.0	-57.1	<=8.0
2432.30	15.3	10.3	3.0	2.0	-56.9	<=8.0
2432.35	15.2	10.3	2.9	2.0	-57.0	<=8.0
2432.40	15.2	10.3	2.9	2.0	-57.0	<=8.0
2432.45	15.0	10.3	2.7	2.0	-57.2	<=8.0
2432.50	14.9	10.3	2.6	2.0	-57.3	<=8.0
2432.55	15.4	10.3	3.1	2.0	-56.8	<=8.0
2432.60	15.2	10.3	2.9	2.0	-57.0	<=8.0
2432.65	15.4	10.3	3.1	2.0	-56.8	<=8.0
2432.70	15.7	10.3	3.4	2.0	-56.5	<=8.0
2432.75	16.1	10.3	3.8	2.0	-56.1	<=8.0

2432.80	16.0	10.3	3.7	2.0	-56.2	<=8.0
2432.85	15.9	10.3	3.6	2.0	-56.3	<=8.0
2432.90	15.6	10.3	3.3	2.0	-56.6	<=8.0
2432.95	15.8	10.3	3.5	2.0	-56.4	<=8.0
2433.00	15.5	10.3	3.2	2.0	-56.7	<=8.0
2433.05	15.5	10.3	3.2	2.0	-56.7	<=8.0
2433.10	14.9	10.3	2.6	2.0	-57.3	<=8.0
2433.15	14.7	10.3	2.4	2.0	-57.5	<=8.0
2433.20	14.7	10.3	2.4	2.0	-57.5	<=8.0
2433.25	14.6	10.3	2.3	2.0	-57.6	<=8.0
2433.30	14.6	10.3	2.3	2.0	-57.6	<=8.0
2433.35	14.6	10.3	2.3	2.0	-57.6	<=8.0
2433.40	14.6	10.3	2.3	2.0	-57.6	<=8.0
2433.45	14.7	10.3	2.4	2.0	-57.5	<=8.0
2433.50	14.6	10.3	2.3	2.0	-57.6	<=8.0
2433.55	14.8	10.3	2.5	2.0	-57.4	<=8.0
2433.60	14.5	10.3	2.2	2.0	-57.7	<=8.0
2433.65	14.4	10.3	2.1	2.0	-57.8	<=8.0
2433.70	14.7	10.3	2.4	2.0	-57.5	<=8.0
2433.75	15.1	10.3	2.8	2.0	-57.1	<=8.0
2433.80	15.2	10.3	2.9	2.0	-57.0	<=8.0
2433.85	15.2	10.3	2.9	2.0	-57.0	<=8.0
2433.90	15.1	10.3	2.8	2.0	-57.1	<=8.0
2433.95	15.2	10.3	2.9	2.0	-57.0	<=8.0
2434.00	14.8	10.3	2.5	2.0	-57.4	<=8.0
2434.05	14.7	10.3	2.4	2.0	-57.5	<=8.0
2434.10	14.2	10.3	1.9	2.0	-58.0	<=8.0
2434.15	14.4	10.3	2.1	2.0	-57.8	<=8.0
2434.20	14.6	10.3	2.3	2.0	-57.6	<=8.0
2434.25	14.3	10.3	2.0	2.0	-57.9	<=8.0
2434.30	14.3	10.3	2.0	2.0	-57.9	<=8.0
2434.35	14.2	10.3	1.9	2.0	-58.0	<=8.0
2434.40	14.1	10.3	1.8	2.0	-58.1	<=8.0
2434.45	14.1	10.3	1.8	2.0	-58.1	<=8.0
2434.50	14.1	10.3	1.8	2.0	-58.1	<=8.0
2434.55	14.3	10.3	2.0	2.0	-57.9	<=8.0
2434.60	14.3	10.3	2.0	2.0	-57.9	<=8.0
2434.65	14.4	10.3	2.1	2.0	-57.8	<=8.0
2434.70	14.5	10.3	2.2	2.0	-57.7	<=8.0
2434.75	14.8	10.3	2.5	2.0	-57.4	<=8.0
2434.80	14.6	10.3	2.3	2.0	-57.6	<=8.0
2434.85	14.6	10.3	2.3	2.0	-57.6	<=8.0
2434.90	14.6	10.3	2.3	2.0	-57.6	<=8.0
2434.95	14.8	10.3	2.5	2.0	-57.4	<=8.0
2435.00	14.5	10.3	2.2	2.0	-57.7	<=8.0
2435.05	14.3	10.3	2.0	2.0	-57.9	<=8.0

2435.10	13.7	10.3	1.4	2.0	-58.5	<=8.0
2435.15	14.1	10.3	1.8	2.0	-58.1	<=8.0
2435.20	13.7	10.3	1.4	2.0	-58.5	<=8.0
2435.25	13.9	10.3	1.6	2.0	-58.3	<=8.0
2435.30	14.0	10.3	1.7	2.0	-58.2	<=8.0
2435.35	14.0	10.3	1.7	2.0	-58.2	<=8.0
2435.40	13.9	10.3	1.6	2.0	-58.3	<=8.0
2435.45	13.8	10.3	1.5	2.0	-58.4	<=8.0
2435.50	13.8	10.3	1.5	2.0	-58.4	<=8.0
2435.55	14.0	10.3	1.7	2.0	-58.2	<=8.0
2435.60	14.2	10.3	1.9	2.0	-58.0	<=8.0
2435.65	14.2	10.3	1.9	2.0	-58.0	<=8.0
2435.70	14.4	10.3	2.1	2.0	-57.8	<=8.0
2435.75	14.7	10.3	2.4	2.0	-57.5	<=8.0
2435.80	14.8	10.3	2.5	2.0	-57.4	<=8.0
2435.85	14.9	10.3	2.6	2.0	-57.3	<=8.0
2435.90	14.7	10.3	2.4	2.0	-57.5	<=8.0
2435.95	14.8	10.3	2.5	2.0	-57.4	<=8.0
2436.00	14.5	10.3	2.2	2.0	-57.7	<=8.0
2436.05	14.5	10.3	2.2	2.0	-57.7	<=8.0
2436.10	14.3	10.3	2.0	2.0	-57.9	<=8.0
2436.15	14.3	10.3	2.0	2.0	-57.9	<=8.0
2436.20	14.2	10.3	1.9	2.0	-58.0	<=8.0
2436.25	13.9	10.3	1.6	2.0	-58.3	<=8.0
2436.30	13.6	10.3	1.3	2.0	-58.6	<=8.0
2436.35	13.5	10.3	1.2	2.0	-58.7	<=8.0
2436.40	13.2	10.3	0.9	2.0	-59.0	<=8.0
2436.45	13.4	10.3	1.1	2.0	-58.8	<=8.0
2436.50	13.4	10.3	1.1	2.0	-58.8	<=8.0
2436.55	13.7	10.3	1.4	2.0	-58.5	<=8.0
2436.60	13.8	10.3	1.5	2.0	-58.4	<=8.0
2436.65	14.1	10.3	1.8	2.0	-58.1	<=8.0
2436.70	14.5	10.3	2.2	2.0	-57.7	<=8.0
2436.75	15.1	10.3	2.8	2.0	-57.1	<=8.0
2436.80	15.8	10.3	3.5	2.0	-56.4	<=8.0
2436.85	16.7	10.3	4.4	2.0	-55.5	<=8.0
2436.90	18.0	10.3	5.7	2.0	-54.2	<=8.0
2436.95	19.1	10.3	6.8	2.0	-53.1	<=8.0
2437.00	20.3	10.3	8.0	2.0	-51.9	<=8.0
2437.05	21.5	10.3	9.2	2.0	-50.7	<=8.0
2437.10	22.9	10.3	10.6	2.0	-49.3	<=8.0
2437.15	23.4	10.3	11.1	2.0	-48.8	<=8.0
2437.20	22.0	10.3	9.7	2.0	-50.2	<=8.0
2437.25	20.8	10.3	8.5	2.0	-51.4	<=8.0
2437.30	19.9	10.3	7.6	2.0	-52.3	<=8.0
2437.35	18.7	10.3	6.4	2.0	-53.5	<=8.0

2437.40	17.3	10.3	5.0	2.0	-54.9	<=8.0
2437.45	16.5	10.3	4.2	2.0	-55.7	<=8.0
2437.50	15.4	10.3	3.1	2.0	-56.8	<=8.0
2437.55	14.8	10.3	2.5	2.0	-57.4	<=8.0
2437.60	14.3	10.3	2.0	2.0	-57.9	<=8.0
2437.65	13.9	10.3	1.6	2.0	-58.3	<=8.0
2437.70	13.6	10.3	1.3	2.0	-58.6	<=8.0
2437.75	13.5	10.3	1.2	2.0	-58.7	<=8.0
2437.80	13.2	10.3	0.9	2.0	-59.0	<=8.0
2437.85	13.0	10.3	0.7	2.0	-59.2	<=8.0
2437.90	13.3	10.3	1.0	2.0	-58.9	<=8.0
2437.95	13.5	10.3	1.2	2.0	-58.7	<=8.0
2438.00	13.6	10.3	1.3	2.0	-58.6	<=8.0
2438.05	13.9	10.3	1.6	2.0	-58.3	<=8.0
2438.10	13.7	10.3	1.4	2.0	-58.5	<=8.0
2438.15	14.1	10.3	1.8	2.0	-58.1	<=8.0
2438.20	14.3	10.3	2.0	2.0	-57.9	<=8.0
2438.25	14.4	10.3	2.1	2.0	-57.8	<=8.0
2438.30	14.3	10.3	2.0	2.0	-57.9	<=8.0
2438.35	14.4	10.3	2.1	2.0	-57.8	<=8.0
2438.40	14.4	10.3	2.1	2.0	-57.8	<=8.0
2438.45	14.5	10.3	2.2	2.0	-57.7	<=8.0
2438.50	14.3	10.3	2.0	2.0	-57.9	<=8.0
2438.55	14.3	10.3	2.0	2.0	-57.9	<=8.0
2438.60	13.9	10.3	1.6	2.0	-58.3	<=8.0
2438.65	13.8	10.3	1.5	2.0	-58.4	<=8.0
2438.70	13.7	10.3	1.4	2.0	-58.5	<=8.0
2438.75	13.8	10.3	1.5	2.0	-58.4	<=8.0
2438.80	13.5	10.3	1.2	2.0	-58.7	<=8.0
2438.85	13.5	10.3	1.2	2.0	-58.7	<=8.0
2438.90	13.5	10.3	1.2	2.0	-58.7	<=8.0
2438.95	13.7	10.3	1.4	2.0	-58.5	<=8.0
2439.00	13.6	10.3	1.3	2.0	-58.6	<=8.0
2439.05	13.6	10.3	1.3	2.0	-58.6	<=8.0
2439.10	13.4	10.3	1.1	2.0	-58.8	<=8.0
2439.15	13.9	10.3	1.6	2.0	-58.3	<=8.0
2439.20	13.9	10.3	1.6	2.0	-58.3	<=8.0
2439.25	14.1	10.3	1.8	2.0	-58.1	<=8.0
2439.30	14.0	10.3	1.7	2.0	-58.2	<=8.0
2439.35	14.1	10.3	1.8	2.0	-58.1	<=8.0
2439.40	14.2	10.3	1.9	2.0	-58.0	<=8.0
2439.45	14.4	10.3	2.1	2.0	-57.8	<=8.0
2439.50	14.0	10.3	1.7	2.0	-58.2	<=8.0
2439.55	14.3	10.3	2.0	2.0	-57.9	<=8.0
2439.60	14.1	10.3	1.8	2.0	-58.1	<=8.0
2439.65	14.0	10.3	1.7	2.0	-58.2	<=8.0

2439.70	13.9	10.3	1.6	2.0	-58.3	<=8.0
2439.75	13.9	10.3	1.6	2.0	-58.3	<=8.0
2439.80	13.9	10.3	1.6	2.0	-58.3	<=8.0
2439.85	13.8	10.3	1.5	2.0	-58.4	<=8.0
2439.90	13.7	10.3	1.4	2.0	-58.5	<=8.0
2439.95	14.0	10.3	1.7	2.0	-58.2	<=8.0
2440.00	13.8	10.3	1.5	2.0	-58.4	<=8.0
2440.05	14.0	10.3	1.7	2.0	-58.2	<=8.0
2440.10	13.6	10.3	1.3	2.0	-58.6	<=8.0
2440.15	14.0	10.3	1.7	2.0	-58.2	<=8.0
2440.20	14.2	10.3	1.9	2.0	-58.0	<=8.0
2440.25	14.3	10.3	2.0	2.0	-57.9	<=8.0
2440.30	14.3	10.3	2.0	2.0	-57.9	<=8.0
2440.35	14.5	10.3	2.2	2.0	-57.7	<=8.0
2440.40	14.5	10.3	2.2	2.0	-57.7	<=8.0
2440.45	14.9	10.3	2.6	2.0	-57.3	<=8.0
2440.50	14.4	10.3	2.1	2.0	-57.8	<=8.0
2440.55	14.6	10.3	2.3	2.0	-57.6	<=8.0
2440.60	14.2	10.3	1.9	2.0	-58.0	<=8.0
2440.65	14.1	10.3	1.8	2.0	-58.1	<=8.0
2440.70	14.1	10.3	1.8	2.0	-58.1	<=8.0
2440.75	14.3	10.3	2.0	2.0	-57.9	<=8.0
2440.80	14.2	10.3	1.9	2.0	-58.0	<=8.0
2440.85	14.1	10.3	1.8	2.0	-58.1	<=8.0
2440.90	14.0	10.3	1.7	2.0	-58.2	<=8.0
2440.95	14.3	10.3	2.0	2.0	-57.9	<=8.0
2441.00	14.2	10.3	1.9	2.0	-58.0	<=8.0
2441.05	14.1	10.3	1.8	2.0	-58.1	<=8.0
2441.10	13.8	10.3	1.5	2.0	-58.4	<=8.0
2441.15	14.1	10.3	1.8	2.0	-58.1	<=8.0
2441.20	14.5	10.3	2.2	2.0	-57.7	<=8.0
2441.25	14.7	10.3	2.4	2.0	-57.5	<=8.0
2441.30	14.9	10.3	2.6	2.0	-57.3	<=8.0
2441.35	15.1	10.3	2.8	2.0	-57.1	<=8.0
2441.40	15.2	10.3	2.9	2.0	-57.0	<=8.0
2441.45	15.3	10.3	3.0	2.0	-56.9	<=8.0
2441.50	15.0	10.3	2.7	2.0	-57.2	<=8.0
2441.55	15.0	10.3	2.7	2.0	-57.2	<=8.0
2441.60	14.6	10.3	2.3	2.0	-57.6	<=8.0
2441.65	14.2	10.3	1.9	2.0	-58.0	<=8.0
2441.70	14.2	10.3	1.9	2.0	-58.0	<=8.0
2441.75	14.4	10.3	2.1	2.0	-57.8	<=8.0
2441.80	14.3	10.3	2.0	2.0	-57.9	<=8.0
2441.85	14.0	10.3	1.7	2.0	-58.2	<=8.0
2441.90	14.3	10.3	2.0	2.0	-57.9	<=8.0
2441.95	14.4	10.3	2.1	2.0	-57.8	<=8.0

2442.00	14.4	10.3	2.1	2.0	-57.8	<=8.0
2442.05	14.2	10.3	1.9	2.0	-58.0	<=8.0
2442.10	14.1	10.3	1.8	2.0	-58.1	<=8.0
2442.15	14.5	10.3	2.2	2.0	-57.7	<=8.0
2442.20	15.1	10.3	2.8	2.0	-57.1	<=8.0
2442.25	16.0	10.3	3.7	2.0	-56.2	<=8.0
2442.30	16.7	10.3	4.4	2.0	-55.5	<=8.0
2442.35	17.8	10.3	5.5	2.0	-54.4	<=8.0
2442.40	18.9	10.3	6.6	2.0	-53.3	<=8.0
2442.45	20.3	10.3	8.0	2.0	-51.9	<=8.0
2442.50	21.7	10.3	9.4	2.0	-50.5	<=8.0
2442.55	23.2	10.3	10.9	2.0	-49.0	<=8.0
2442.60	23.9	10.3	11.6	2.0	-48.3	<=8.0
2442.65	23.8	10.3	11.5	2.0	-48.4	<=8.0
2442.70	23.5	10.3	11.2	2.0	-48.7	<=8.0
2442.75	21.9	10.3	9.6	2.0	-50.3	<=8.0
2442.80	20.1	10.3	7.8	2.0	-52.1	<=8.0
2442.85	18.0	10.3	5.7	2.0	-54.2	<=8.0
2442.90	17.4	10.3	5.1	2.0	-54.8	<=8.0
2442.95	17.4	10.3	5.1	2.0	-54.8	<=8.0
2443.00	16.7	10.3	4.4	2.0	-55.5	<=8.0
2443.05	15.9	10.3	3.6	2.0	-56.3	<=8.0
2443.10	14.9	10.3	2.6	2.0	-57.3	<=8.0
2443.15	14.7	10.3	2.4	2.0	-57.5	<=8.0
2443.20	14.7	10.3	2.4	2.0	-57.5	<=8.0
2443.25	14.9	10.3	2.6	2.0	-57.3	<=8.0
2443.30	15.3	10.3	3.0	2.0	-56.9	<=8.0
2443.35	15.4	10.3	3.1	2.0	-56.8	<=8.0
2443.40	15.4	10.3	3.1	2.0	-56.8	<=8.0
2443.45	15.3	10.3	3.0	2.0	-56.9	<=8.0
2443.50	15.3	10.3	3.0	2.0	-56.9	<=8.0
2443.55	15.4	10.3	3.1	2.0	-56.8	<=8.0
2443.60	15.3	10.3	3.0	2.0	-56.9	<=8.0
2443.65	15.5	10.3	3.2	2.0	-56.7	<=8.0
2443.70	15.8	10.3	3.5	2.0	-56.4	<=8.0
2443.75	16.4	10.3	4.1	2.0	-55.8	<=8.0
2443.80	16.7	10.3	4.4	2.0	-55.5	<=8.0
2443.85	16.9	10.3	4.6	2.0	-55.3	<=8.0
2443.90	17.0	10.3	4.7	2.0	-55.2	<=8.0
2443.95	16.9	10.3	4.6	2.0	-55.3	<=8.0
2444.00	16.5	10.3	4.2	2.0	-55.7	<=8.0
2444.05	16.0	10.3	3.7	2.0	-56.2	<=8.0
2444.10	15.8	10.3	3.5	2.0	-56.4	<=8.0
2444.15	15.6	10.3	3.3	2.0	-56.6	<=8.0
2444.20	15.7	10.3	3.4	2.0	-56.5	<=8.0
2444.25	15.9	10.3	3.6	2.0	-56.3	<=8.0

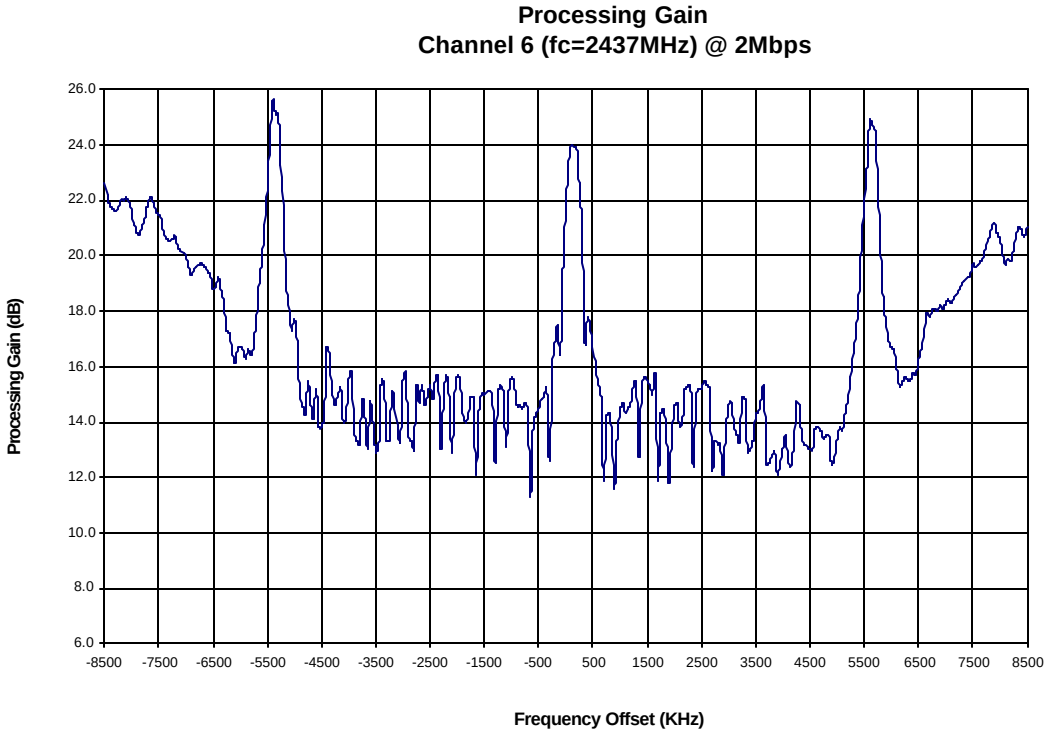
2444.30	16.4	10.3	4.1	2.0	-55.8	<=8.0
2444.35	16.7	10.3	4.4	2.0	-55.5	<=8.0
2444.40	16.7	10.3	4.4	2.0	-55.5	<=8.0
2444.45	16.6	10.3	4.3	2.0	-55.6	<=8.0
2444.50	16.7	10.3	4.4	2.0	-55.5	<=8.0
2444.55	16.7	10.3	4.4	2.0	-55.5	<=8.0
2444.60	16.6	10.3	4.3	2.0	-55.6	<=8.0
2444.65	16.5	10.3	4.2	2.0	-55.7	<=8.0
2444.70	16.8	10.3	4.5	2.0	-55.4	<=8.0
2444.75	17.3	10.3	5.0	2.0	-54.9	<=8.0
2444.80	17.7	10.3	5.4	2.0	-54.5	<=8.0
2444.85	18.1	10.3	5.8	2.0	-54.1	<=8.0
2444.90	18.1	10.3	5.8	2.0	-54.1	<=8.0
2444.95	18.1	10.3	5.8	2.0	-54.1	<=8.0
2445.00	17.7	10.3	5.4	2.0	-54.5	<=8.0
2445.05	17.1	10.3	4.8	2.0	-55.1	<=8.0
2445.10	16.7	10.3	4.4	2.0	-55.5	<=8.0
2445.15	16.6	10.3	4.3	2.0	-55.6	<=8.0
2445.20	16.8	10.3	4.5	2.0	-55.4	<=8.0
2445.25	17.1	10.3	4.8	2.0	-55.1	<=8.0
2445.30	17.6	10.3	5.3	2.0	-54.6	<=8.0
2445.35	18.0	10.3	5.7	2.0	-54.2	<=8.0
2445.40	17.9	10.3	5.6	2.0	-54.3	<=8.0
2445.45	17.8	10.3	5.5	2.0	-54.4	<=8.0
2445.50	17.8	10.3	5.5	2.0	-54.4	<=8.0

6.14.4.2. Test Configuration #2: DQPSK, 2 Mbps

Data Modulation: DQPSK
Data Rate or Bit Rate: 2 Mb/s,
Symbol Rate: 1 MS/s
Chip Rate: 11 MC/s
Chip/Symbol Rate: 11:1

Theoretical Process Gain = Chip Rate/Symbol Rate = 11 dB

Measured Minimum Process Gain = 13.8 dB (after discarding 20% of worst measurements)



DQPSK, 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2428.50	22.6	13.3	7.3	2.0	-52.6	<=8.0
2428.55	22.2	13.3	6.9	2.0	-53.0	<=8.0
2428.60	21.8	13.3	6.5	2.0	-53.4	<=8.0
2428.65	21.7	13.3	6.4	2.0	-53.5	<=8.0
2428.70	21.6	13.3	6.3	2.0	-53.6	<=8.0
2428.75	21.7	13.3	6.4	2.0	-53.5	<=8.0
2428.80	22.0	13.3	6.7	2.0	-53.2	<=8.0
2428.85	22.0	13.3	6.7	2.0	-53.2	<=8.0
2428.90	22.1	13.3	6.8	2.0	-53.1	<=8.0
2428.95	21.9	13.3	6.6	2.0	-53.3	<=8.0
2429.00	21.6	13.3	6.3	2.0	-53.6	<=8.0
2429.05	21.1	13.3	5.8	2.0	-54.1	<=8.0
2429.10	20.8	13.3	5.5	2.0	-54.4	<=8.0
2429.15	20.8	13.3	5.5	2.0	-54.4	<=8.0
2429.20	21.1	13.3	5.8	2.0	-54.1	<=8.0
2429.25	21.4	13.3	6.1	2.0	-53.8	<=8.0
2429.30	21.9	13.3	6.6	2.0	-53.3	<=8.0
2429.35	22.1	13.3	6.8	2.0	-53.1	<=8.0
2429.40	21.9	13.3	6.6	2.0	-53.3	<=8.0
2429.45	21.6	13.3	6.3	2.0	-53.6	<=8.0
2429.50	21.5	13.3	6.2	2.0	-53.7	<=8.0
2429.55	21.2	13.3	5.9	2.0	-54.0	<=8.0
2429.60	20.8	13.3	5.5	2.0	-54.4	<=8.0
2429.65	20.6	13.3	5.3	2.0	-54.6	<=8.0
2429.70	20.5	13.3	5.2	2.0	-54.7	<=8.0
2429.75	20.6	13.3	5.3	2.0	-54.6	<=8.0
2429.80	20.7	13.3	5.4	2.0	-54.5	<=8.0
2429.85	20.3	13.3	5.0	2.0	-54.9	<=8.0
2429.90	20.2	13.3	4.9	2.0	-55.0	<=8.0
2429.95	20.1	13.3	4.8	2.0	-55.1	<=8.0
2430.00	20.0	13.3	4.7	2.0	-55.2	<=8.0
2430.05	19.6	13.3	4.3	2.0	-55.6	<=8.0
2430.10	19.3	13.3	4.0	2.0	-55.9	<=8.0
2430.15	19.5	13.3	4.2	2.0	-55.7	<=8.0
2430.20	19.6	13.3	4.3	2.0	-55.6	<=8.0
2430.25	19.7	13.3	4.4	2.0	-55.5	<=8.0
2430.30	19.7	13.3	4.4	2.0	-55.5	<=8.0
2430.35	19.6	13.3	4.3	2.0	-55.6	<=8.0
2430.40	19.4	13.3	4.1	2.0	-55.8	<=8.0
2430.45	19.3	13.3	4.0	2.0	-55.9	<=8.0

2430.50	18.8	13.3	3.5	2.0	-56.4	<=8.0
2430.55	18.9	13.3	3.6	2.0	-56.3	<=8.0
2430.60	19.2	13.3	3.9	2.0	-56.0	<=8.0
2430.65	18.7	13.3	3.4	2.0	-56.5	<=8.0
2430.70	18.3	13.3	3.0	2.0	-56.9	<=8.0
2430.75	17.3	13.3	2.0	2.0	-57.9	<=8.0
2430.80	17.2	13.3	1.9	2.0	-58.0	<=8.0
2430.85	16.6	13.3	1.3	2.0	-58.6	<=8.0
2430.90	16.1	13.3	0.8	2.0	-59.1	<=8.0
2430.95	16.6	13.3	1.3	2.0	-58.6	<=8.0
2431.00	16.7	13.3	1.4	2.0	-58.5	<=8.0
2431.05	16.6	13.3	1.3	2.0	-58.6	<=8.0
2431.10	16.3	13.3	1.0	2.0	-58.9	<=8.0
2431.15	16.6	13.3	1.3	2.0	-58.6	<=8.0
2431.20	16.4	13.3	1.1	2.0	-58.8	<=8.0
2431.25	16.8	13.3	1.5	2.0	-58.4	<=8.0
2431.30	17.7	13.3	2.4	2.0	-57.5	<=8.0
2431.35	19.0	13.3	3.7	2.0	-56.2	<=8.0
2431.40	19.8	13.3	4.5	2.0	-55.4	<=8.0
2431.45	21.1	13.3	5.8	2.0	-54.1	<=8.0
2431.50	22.5	13.3	7.2	2.0	-52.7	<=8.0
2431.55	24.3	13.3	9.0	2.0	-50.9	<=8.0
2431.60	25.6	13.3	10.3	2.0	-49.6	<=8.0
2431.65	25.1	13.3	9.8	2.0	-50.1	<=8.0
2431.70	25.1	13.3	9.8	2.0	-50.1	<=8.0
2431.75	23.3	13.3	8.0	2.0	-51.9	<=8.0
2431.80	21.3	13.3	6.0	2.0	-53.9	<=8.0
2431.85	19.1	13.3	3.8	2.0	-56.1	<=8.0
2431.90	18.0	13.3	2.7	2.0	-57.2	<=8.0
2431.95	17.3	13.3	2.0	2.0	-57.9	<=8.0
2432.00	17.7	13.3	2.4	2.0	-57.5	<=8.0
2432.05	16.9	13.3	1.6	2.0	-58.3	<=8.0
2432.10	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2432.15	14.6	13.3	-0.7	2.0	-60.6	<=8.0
2432.20	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2432.25	15.5	13.3	0.2	2.0	-59.7	<=8.0
2432.30	14.6	13.3	-0.7	2.0	-60.6	<=8.0
2432.35	14.1	13.3	-1.2	2.0	-61.1	<=8.0
2432.40	15.2	13.3	-0.1	2.0	-60.0	<=8.0
2432.45	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2432.50	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2432.55	14.2	13.3	-1.1	2.0	-61.0	<=8.0
2432.60	16.7	13.3	1.4	2.0	-58.5	<=8.0
2432.65	16.4	13.3	1.1	2.0	-58.8	<=8.0
2432.70	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2432.75	14.6	13.3	-0.7	2.0	-60.6	<=8.0

2432.80	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2432.85	15.2	13.3	-0.1	2.0	-60.0	<=8.0
2432.90	14.0	13.3	-1.3	2.0	-61.2	<=8.0
2432.95	14.2	13.3	-1.1	2.0	-61.0	<=8.0
2433.00	15.5	13.3	0.2	2.0	-59.7	<=8.0
2433.05	15.8	13.3	0.5	2.0	-59.4	<=8.0
2433.10	13.7	13.3	-1.6	2.0	-61.5	<=8.0
2433.15	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2433.20	13.2	13.3	-2.1	2.0	-62.0	<=8.0
2433.25	14.8	13.3	-0.5	2.0	-60.4	<=8.0
2433.30	14.2	13.3	-1.1	2.0	-61.0	<=8.0
2433.35	13.0	13.3	-2.3	2.0	-62.2	<=8.0
2433.40	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2433.45	13.9	13.3	-1.4	2.0	-61.3	<=8.0
2433.50	12.9	13.3	-2.4	2.0	-62.3	<=8.0
2433.55	13.1	13.3	-2.2	2.0	-62.1	<=8.0
2433.60	15.5	13.3	0.2	2.0	-59.7	<=8.0
2433.65	15.4	13.3	0.1	2.0	-59.8	<=8.0
2433.70	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2433.75	13.4	13.3	-1.9	2.0	-61.8	<=8.0
2433.80	15.1	13.3	-0.2	2.0	-60.1	<=8.0
2433.85	14.5	13.3	-0.8	2.0	-60.7	<=8.0
2433.90	13.9	13.3	-1.4	2.0	-61.3	<=8.0
2433.95	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2434.00	15.5	13.3	0.2	2.0	-59.7	<=8.0
2434.05	15.8	13.3	0.5	2.0	-59.4	<=8.0
2434.10	13.5	13.3	-1.8	2.0	-61.7	<=8.0
2434.15	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2434.20	13.0	13.3	-2.3	2.0	-62.2	<=8.0
2434.25	15.3	13.3	0.0	2.0	-59.9	<=8.0
2434.30	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2434.35	15.3	13.3	0.0	2.0	-59.9	<=8.0
2434.40	14.6	13.3	-0.7	2.0	-60.6	<=8.0
2434.45	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2434.50	15.3	13.3	0.0	2.0	-59.9	<=8.0
2434.55	14.8	13.3	-0.5	2.0	-60.4	<=8.0
2434.60	15.6	13.3	0.3	2.0	-59.6	<=8.0
2434.65	15.7	13.3	0.4	2.0	-59.5	<=8.0
2434.70	13.0	13.3	-2.3	2.0	-62.2	<=8.0
2434.75	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2434.80	15.7	13.3	0.4	2.0	-59.5	<=8.0
2434.85	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2434.90	12.9	13.3	-2.4	2.0	-62.3	<=8.0
2434.95	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2435.00	15.7	13.3	0.4	2.0	-59.5	<=8.0
2435.05	15.5	13.3	0.2	2.0	-59.7	<=8.0

2435.10	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2435.15	14.0	13.3	-1.3	2.0	-61.2	<=8.0
2435.20	14.2	13.3	-1.1	2.0	-61.0	<=8.0
2435.25	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2435.30	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2435.35	12.1	13.3	-3.2	2.0	-63.1	<=8.0
2435.40	14.5	13.3	-0.8	2.0	-60.7	<=8.0
2435.45	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2435.50	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2435.55	15.1	13.3	-0.2	2.0	-60.1	<=8.0
2435.60	15.1	13.3	-0.2	2.0	-60.1	<=8.0
2435.65	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2435.70	12.5	13.3	-2.8	2.0	-62.7	<=8.0
2435.75	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2435.80	15.3	13.3	0.0	2.0	-59.9	<=8.0
2435.85	15.1	13.3	-0.2	2.0	-60.1	<=8.0
2435.90	13.1	13.3	-2.2	2.0	-62.1	<=8.0
2435.95	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2436.00	15.6	13.3	0.3	2.0	-59.6	<=8.0
2436.05	15.4	13.3	0.1	2.0	-59.8	<=8.0
2436.10	14.6	13.3	-0.7	2.0	-60.6	<=8.0
2436.15	14.6	13.3	-0.7	2.0	-60.6	<=8.0
2436.20	14.5	13.3	-0.8	2.0	-60.7	<=8.0
2436.25	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2436.30	14.4	13.3	-0.9	2.0	-60.8	<=8.0
2436.35	11.3	13.3	-4.0	2.0	-63.9	<=8.0
2436.40	13.9	13.3	-1.4	2.0	-61.3	<=8.0
2436.45	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2436.50	14.5	13.3	-0.8	2.0	-60.7	<=8.0
2436.55	14.8	13.3	-0.5	2.0	-60.4	<=8.0
2436.60	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2436.65	15.2	13.3	-0.1	2.0	-60.0	<=8.0
2436.70	12.6	13.3	-2.7	2.0	-62.6	<=8.0
2436.75	15.9	13.3	0.6	2.0	-59.3	<=8.0
2436.80	16.9	13.3	1.6	2.0	-58.3	<=8.0
2436.85	17.5	13.3	2.2	2.0	-57.7	<=8.0
2436.90	16.5	13.3	1.2	2.0	-58.7	<=8.0
2436.95	19.7	13.3	4.4	2.0	-55.5	<=8.0
2437.00	21.7	13.3	6.4	2.0	-53.5	<=8.0
2437.05	23.3	13.3	8.0	2.0	-51.9	<=8.0
2437.10	24.0	13.3	8.7	2.0	-51.2	<=8.0
2437.15	23.9	13.3	8.6	2.0	-51.3	<=8.0
2437.20	23.9	13.3	8.6	2.0	-51.3	<=8.0
2437.25	22.6	13.3	7.3	2.0	-52.6	<=8.0
2437.30	21.0	13.3	5.7	2.0	-54.2	<=8.0
2437.35	16.9	13.3	1.6	2.0	-58.3	<=8.0

2437.40	17.8	13.3	2.5	2.0	-57.4	<=8.0
2437.45	17.4	13.3	2.1	2.0	-57.8	<=8.0
2437.50	16.7	13.3	1.4	2.0	-58.5	<=8.0
2437.55	16.0	13.3	0.7	2.0	-59.2	<=8.0
2437.60	15.4	13.3	0.1	2.0	-59.8	<=8.0
2437.65	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2437.70	11.9	13.3	-3.4	2.0	-63.3	<=8.0
2437.75	14.2	13.3	-1.1	2.0	-61.0	<=8.0
2437.80	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2437.85	13.6	13.3	-1.7	2.0	-61.6	<=8.0
2437.90	11.6	13.3	-3.7	2.0	-63.6	<=8.0
2437.95	13.5	13.3	-1.8	2.0	-61.7	<=8.0
2438.00	14.4	13.3	-0.9	2.0	-60.8	<=8.0
2438.05	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2438.10	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2438.15	14.5	13.3	-0.8	2.0	-60.7	<=8.0
2438.20	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2438.25	15.4	13.3	0.1	2.0	-59.8	<=8.0
2438.30	15.5	13.3	0.2	2.0	-59.7	<=8.0
2438.35	12.7	13.3	-2.6	2.0	-62.5	<=8.0
2438.40	15.3	13.3	0.0	2.0	-59.9	<=8.0
2438.45	15.6	13.3	0.3	2.0	-59.6	<=8.0
2438.50	15.5	13.3	0.2	2.0	-59.7	<=8.0
2438.55	15.3	13.3	0.0	2.0	-59.9	<=8.0
2438.60	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2438.65	15.7	13.3	0.4	2.0	-59.5	<=8.0
2438.70	11.9	13.3	-3.4	2.0	-63.3	<=8.0
2438.75	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2438.80	14.5	13.3	-0.8	2.0	-60.7	<=8.0
2438.85	13.7	13.3	-1.6	2.0	-61.5	<=8.0
2438.90	11.8	13.3	-3.5	2.0	-63.4	<=8.0
2438.95	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2439.00	14.5	13.3	-0.8	2.0	-60.7	<=8.0
2439.05	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2439.10	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2439.15	14.0	13.3	-1.3	2.0	-61.2	<=8.0
2439.20	15.2	13.3	-0.1	2.0	-60.0	<=8.0
2439.25	15.3	13.3	0.0	2.0	-59.9	<=8.0
2439.30	15.3	13.3	0.0	2.0	-59.9	<=8.0
2439.35	12.4	13.3	-2.9	2.0	-62.8	<=8.0
2439.40	15.0	13.3	-0.3	2.0	-60.2	<=8.0
2439.45	15.2	13.3	-0.1	2.0	-60.0	<=8.0
2439.50	15.2	13.3	-0.1	2.0	-60.0	<=8.0
2439.55	15.5	13.3	0.2	2.0	-59.7	<=8.0
2439.60	15.3	13.3	0.0	2.0	-59.9	<=8.0
2439.65	15.2	13.3	-0.1	2.0	-60.0	<=8.0

2439.70	12.3	13.3	-3.0	2.0	-62.9	<=8.0
2439.75	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2439.80	13.2	13.3	-2.1	2.0	-62.0	<=8.0
2439.85	13.2	13.3	-2.1	2.0	-62.0	<=8.0
2439.90	12.1	13.3	-3.2	2.0	-63.1	<=8.0
2439.95	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2440.00	14.6	13.3	-0.7	2.0	-60.6	<=8.0
2440.05	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2440.10	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2440.15	13.6	13.3	-1.7	2.0	-61.6	<=8.0
2440.20	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2440.25	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2440.30	14.9	13.3	-0.4	2.0	-60.3	<=8.0
2440.35	12.9	13.3	-2.4	2.0	-62.3	<=8.0
2440.40	13.0	13.3	-2.3	2.0	-62.2	<=8.0
2440.45	13.3	13.3	-2.0	2.0	-61.9	<=8.0
2440.50	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2440.55	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2440.60	14.8	13.3	-0.5	2.0	-60.4	<=8.0
2440.65	15.3	13.3	0.0	2.0	-59.9	<=8.0
2440.70	12.5	13.3	-2.8	2.0	-62.7	<=8.0
2440.75	12.5	13.3	-2.8	2.0	-62.7	<=8.0
2440.80	12.8	13.3	-2.5	2.0	-62.4	<=8.0
2440.85	12.9	13.3	-2.4	2.0	-62.3	<=8.0
2440.90	12.1	13.3	-3.2	2.0	-63.1	<=8.0
2440.95	12.5	13.3	-2.8	2.0	-62.7	<=8.0
2441.00	13.0	13.3	-2.3	2.0	-62.2	<=8.0
2441.05	13.5	13.3	-1.8	2.0	-61.7	<=8.0
2441.10	12.6	13.3	-2.7	2.0	-62.6	<=8.0
2441.15	12.4	13.3	-2.9	2.0	-62.8	<=8.0
2441.20	13.1	13.3	-2.2	2.0	-62.1	<=8.0
2441.25	14.7	13.3	-0.6	2.0	-60.5	<=8.0
2441.30	14.6	13.3	-0.7	2.0	-60.6	<=8.0
2441.35	13.4	13.3	-1.9	2.0	-61.8	<=8.0
2441.40	13.2	13.3	-2.1	2.0	-62.0	<=8.0
2441.45	13.1	13.3	-2.2	2.0	-62.1	<=8.0
2441.50	13.0	13.3	-2.3	2.0	-62.2	<=8.0
2441.55	13.0	13.3	-2.3	2.0	-62.2	<=8.0
2441.60	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2441.65	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2441.70	13.7	13.3	-1.6	2.0	-61.5	<=8.0
2441.75	13.4	13.3	-1.9	2.0	-61.8	<=8.0
2441.80	13.5	13.3	-1.8	2.0	-61.7	<=8.0
2441.85	13.5	13.3	-1.8	2.0	-61.7	<=8.0
2441.90	12.5	13.3	-2.8	2.0	-62.7	<=8.0
2441.95	12.7	13.3	-2.6	2.0	-62.5	<=8.0

2442.00	13.4	13.3	-1.9	2.0	-61.8	<=8.0
2442.05	13.8	13.3	-1.5	2.0	-61.4	<=8.0
2442.10	13.7	13.3	-1.6	2.0	-61.5	<=8.0
2442.15	14.3	13.3	-1.0	2.0	-60.9	<=8.0
2442.20	14.8	13.3	-0.5	2.0	-60.4	<=8.0
2442.25	15.6	13.3	0.3	2.0	-59.6	<=8.0
2442.30	16.5	13.3	1.2	2.0	-58.7	<=8.0
2442.35	17.3	13.3	2.0	2.0	-57.9	<=8.0
2442.40	18.5	13.3	3.2	2.0	-56.7	<=8.0
2442.45	20.4	13.3	5.1	2.0	-54.8	<=8.0
2442.50	21.7	13.3	6.4	2.0	-53.5	<=8.0
2442.55	23.1	13.3	7.8	2.0	-52.1	<=8.0
2442.60	24.9	13.3	9.6	2.0	-50.3	<=8.0
2442.65	24.7	13.3	9.4	2.0	-50.5	<=8.0
2442.70	24.5	13.3	9.2	2.0	-50.7	<=8.0
2442.75	22.6	13.3	7.3	2.0	-52.6	<=8.0
2442.80	20.3	13.3	5.0	2.0	-54.9	<=8.0
2442.85	18.5	13.3	3.2	2.0	-56.7	<=8.0
2442.90	17.6	13.3	2.3	2.0	-57.6	<=8.0
2442.95	16.9	13.3	1.6	2.0	-58.3	<=8.0
2443.00	16.7	13.3	1.4	2.0	-58.5	<=8.0
2443.05	16.6	13.3	1.3	2.0	-58.6	<=8.0
2443.10	15.9	13.3	0.6	2.0	-59.3	<=8.0
2443.15	15.3	13.3	0.0	2.0	-59.9	<=8.0
2443.20	15.4	13.3	0.1	2.0	-59.8	<=8.0
2443.25	15.6	13.3	0.3	2.0	-59.6	<=8.0
2443.30	15.5	13.3	0.2	2.0	-59.7	<=8.0
2443.35	15.5	13.3	0.2	2.0	-59.7	<=8.0
2443.40	15.8	13.3	0.5	2.0	-59.4	<=8.0
2443.45	15.7	13.3	0.4	2.0	-59.5	<=8.0
2443.50	16.2	13.3	0.9	2.0	-59.0	<=8.0
2443.55	16.6	13.3	1.3	2.0	-58.6	<=8.0
2443.60	17.2	13.3	1.9	2.0	-58.0	<=8.0
2443.65	17.9	13.3	2.6	2.0	-57.3	<=8.0
2443.70	17.8	13.3	2.5	2.0	-57.4	<=8.0
2443.75	18.0	13.3	2.7	2.0	-57.2	<=8.0
2443.80	18.1	13.3	2.8	2.0	-57.1	<=8.0
2443.85	18.0	13.3	2.7	2.0	-57.2	<=8.0
2443.90	18.2	13.3	2.9	2.0	-57.0	<=8.0
2443.95	18.1	13.3	2.8	2.0	-57.1	<=8.0
2444.00	18.3	13.3	3.0	2.0	-56.9	<=8.0
2444.05	18.4	13.3	3.1	2.0	-56.8	<=8.0
2444.10	18.3	13.3	3.0	2.0	-56.9	<=8.0
2444.15	18.5	13.3	3.2	2.0	-56.7	<=8.0
2444.20	18.6	13.3	3.3	2.0	-56.6	<=8.0
2444.25	18.8	13.3	3.5	2.0	-56.4	<=8.0

2444.30	19.0	13.3	3.7	2.0	-56.2	<=8.0
2444.35	19.1	13.3	3.8	2.0	-56.1	<=8.0
2444.40	19.2	13.3	3.9	2.0	-56.0	<=8.0
2444.45	19.3	13.3	4.0	2.0	-55.9	<=8.0
2444.50	19.7	13.3	4.4	2.0	-55.5	<=8.0
2444.55	19.6	13.3	4.3	2.0	-55.6	<=8.0
2444.60	19.7	13.3	4.4	2.0	-55.5	<=8.0
2444.65	19.8	13.3	4.5	2.0	-55.4	<=8.0
2444.70	20.0	13.3	4.7	2.0	-55.2	<=8.0
2444.75	20.3	13.3	5.0	2.0	-54.9	<=8.0
2444.80	20.7	13.3	5.4	2.0	-54.5	<=8.0
2444.85	21.0	13.3	5.7	2.0	-54.2	<=8.0
2444.90	21.2	13.3	5.9	2.0	-54.0	<=8.0
2444.95	20.8	13.3	5.5	2.0	-54.4	<=8.0
2445.00	20.6	13.3	5.3	2.0	-54.6	<=8.0
2445.05	20.1	13.3	4.8	2.0	-55.1	<=8.0
2445.10	19.7	13.3	4.4	2.0	-55.5	<=8.0
2445.15	19.9	13.3	4.6	2.0	-55.3	<=8.0
2445.20	19.8	13.3	4.5	2.0	-55.4	<=8.0
2445.25	20.2	13.3	4.9	2.0	-55.0	<=8.0
2445.30	20.7	13.3	5.4	2.0	-54.5	<=8.0
2445.35	21.0	13.3	5.7	2.0	-54.2	<=8.0
2445.40	20.9	13.3	5.6	2.0	-54.3	<=8.0
2445.45	20.7	13.3	5.4	2.0	-54.5	<=8.0
2445.50	21.0	13.3	5.7	2.0	-54.2	<=8.0

6.14.4.3. Test Configuration #3: CCK, 5.5 Mbps

Data Modulation: CCK
Data Rate or Bit Rate: 5.5 Mb/s,
Symbol Rate: 1.375 MS/s
Chip Rate: 11 MC/s
Chip Rate/Symbol Rate: 11:1.375 or 8

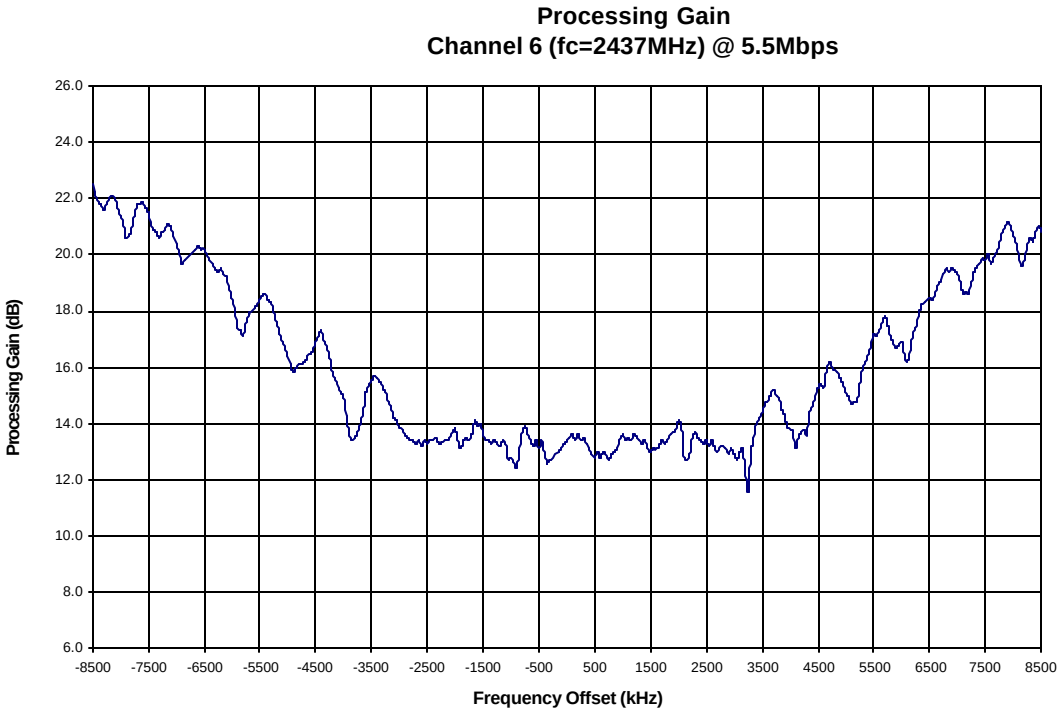
Theoretical Process Gain:

$$G_p = 18.4dB + \left(\frac{J}{S}\right) \geq 10dB$$

The minimum jammer to signal ratio is as follows:

$$\left(\frac{J}{S}\right) \geq -8.4\,dB$$

Measured Minimum Process Gain = 13.4 dB (after discarding 20% of the worst measurements)



CCK, 5.5 Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2428.50	22.5	13.4	7.1	2.0	-52.8	<=8.0
2428.55	22.2	13.4	6.8	2.0	-53.1	<=8.0
2428.60	21.9	13.4	6.5	2.0	-53.4	<=8.0
2428.65	21.8	13.4	6.4	2.0	-53.5	<=8.0
2428.70	21.6	13.4	6.2	2.0	-53.7	<=8.0
2428.75	21.8	13.4	6.4	2.0	-53.5	<=8.0
2428.80	22.0	13.4	6.6	2.0	-53.3	<=8.0
2428.85	22.1	13.4	6.7	2.0	-53.2	<=8.0
2428.90	22.0	13.4	6.6	2.0	-53.3	<=8.0
2428.95	21.7	13.4	6.3	2.0	-53.6	<=8.0
2429.00	21.4	13.4	6.0	2.0	-53.9	<=8.0
2429.05	21.2	13.4	5.8	2.0	-54.1	<=8.0
2429.10	20.6	13.4	5.2	2.0	-54.7	<=8.0
2429.15	20.7	13.4	5.3	2.0	-54.6	<=8.0
2429.20	20.9	13.4	5.5	2.0	-54.4	<=8.0
2429.25	21.4	13.4	6.0	2.0	-53.9	<=8.0
2429.30	21.8	13.4	6.4	2.0	-53.5	<=8.0
2429.35	21.8	13.4	6.4	2.0	-53.5	<=8.0
2429.40	21.9	13.4	6.5	2.0	-53.4	<=8.0
2429.45	21.7	13.4	6.3	2.0	-53.6	<=8.0
2429.50	21.5	13.4	6.1	2.0	-53.8	<=8.0
2429.55	21.1	13.4	5.7	2.0	-54.2	<=8.0
2429.60	20.9	13.4	5.5	2.0	-54.4	<=8.0
2429.65	20.8	13.4	5.4	2.0	-54.5	<=8.0
2429.70	20.6	13.4	5.2	2.0	-54.7	<=8.0
2429.75	20.8	13.4	5.4	2.0	-54.5	<=8.0
2429.80	20.9	13.4	5.5	2.0	-54.4	<=8.0
2429.85	21.1	13.4	5.7	2.0	-54.2	<=8.0
2429.90	21.0	13.4	5.6	2.0	-54.3	<=8.0
2429.95	20.7	13.4	5.3	2.0	-54.6	<=8.0
2430.00	20.4	13.4	5.0	2.0	-54.9	<=8.0
2430.05	20.1	13.4	4.7	2.0	-55.2	<=8.0
2430.10	19.7	13.4	4.3	2.0	-55.6	<=8.0
2430.15	19.8	13.4	4.4	2.0	-55.5	<=8.0
2430.20	19.9	13.4	4.5	2.0	-55.4	<=8.0
2430.25	20.0	13.4	4.6	2.0	-55.3	<=8.0
2430.30	20.1	13.4	4.7	2.0	-55.2	<=8.0
2430.35	20.2	13.4	4.8	2.0	-55.1	<=8.0
2430.40	20.3	13.4	4.9	2.0	-55.0	<=8.0
2430.45	20.2	13.4	4.8	2.0	-55.1	<=8.0
2430.50	20.2	13.4	4.8	2.0	-55.1	<=8.0

2430.55	20.0	13.4	4.6	2.0	-55.3	<=8.0
2430.60	19.8	13.4	4.4	2.0	-55.5	<=8.0
2430.65	19.7	13.4	4.3	2.0	-55.6	<=8.0
2430.70	19.5	13.4	4.1	2.0	-55.8	<=8.0
2430.75	19.4	13.4	4.0	2.0	-55.9	<=8.0
2430.80	19.5	13.4	4.1	2.0	-55.8	<=8.0
2430.85	19.3	13.4	3.9	2.0	-56.0	<=8.0
2430.90	19.2	13.4	3.8	2.0	-56.1	<=8.0
2430.95	18.8	13.4	3.4	2.0	-56.5	<=8.0
2431.00	18.5	13.4	3.1	2.0	-56.8	<=8.0
2431.05	18.0	13.4	2.6	2.0	-57.3	<=8.0
2431.10	17.4	13.4	2.0	2.0	-57.9	<=8.0
2431.15	17.3	13.4	1.9	2.0	-58.0	<=8.0
2431.20	17.1	13.4	1.7	2.0	-58.2	<=8.0
2431.25	17.6	13.4	2.2	2.0	-57.7	<=8.0
2431.30	17.9	13.4	2.5	2.0	-57.4	<=8.0
2431.35	18.0	13.4	2.6	2.0	-57.3	<=8.0
2431.40	18.1	13.4	2.7	2.0	-57.2	<=8.0
2431.45	18.2	13.4	2.8	2.0	-57.1	<=8.0
2431.50	18.4	13.4	3.0	2.0	-56.9	<=8.0
2431.55	18.6	13.4	3.2	2.0	-56.7	<=8.0
2431.60	18.6	13.4	3.2	2.0	-56.7	<=8.0
2431.65	18.4	13.4	3.0	2.0	-56.9	<=8.0
2431.70	18.3	13.4	2.9	2.0	-57.0	<=8.0
2431.75	18.0	13.4	2.6	2.0	-57.3	<=8.0
2431.80	17.6	13.4	2.2	2.0	-57.7	<=8.0
2431.85	17.2	13.4	1.8	2.0	-58.1	<=8.0
2431.90	16.9	13.4	1.5	2.0	-58.4	<=8.0
2431.95	16.7	13.4	1.3	2.0	-58.6	<=8.0
2432.00	16.4	13.4	1.0	2.0	-58.9	<=8.0
2432.05	16.1	13.4	0.7	2.0	-59.2	<=8.0
2432.10	15.8	13.4	0.4	2.0	-59.5	<=8.0
2432.15	16.0	13.4	0.6	2.0	-59.3	<=8.0
2432.20	16.1	13.4	0.7	2.0	-59.2	<=8.0
2432.25	16.1	13.4	0.7	2.0	-59.2	<=8.0
2432.30	16.2	13.4	0.8	2.0	-59.1	<=8.0
2432.35	16.4	13.4	1.0	2.0	-58.9	<=8.0
2432.40	16.5	13.4	1.1	2.0	-58.8	<=8.0
2432.45	16.6	13.4	1.2	2.0	-58.7	<=8.0
2432.50	16.9	13.4	1.5	2.0	-58.4	<=8.0
2432.55	17.1	13.4	1.7	2.0	-58.2	<=8.0
2432.60	17.3	13.4	1.9	2.0	-58.0	<=8.0
2432.65	16.9	13.4	1.5	2.0	-58.4	<=8.0
2432.70	16.7	13.4	1.3	2.0	-58.6	<=8.0
2432.75	16.3	13.4	0.9	2.0	-59.0	<=8.0
2432.80	15.8	13.4	0.4	2.0	-59.5	<=8.0

2432.85	15.6	13.4	0.2	2.0	-59.7	<=8.0
2432.90	15.3	13.4	-0.1	2.0	-60.0	<=8.0
2432.95	15.1	13.4	-0.3	2.0	-60.2	<=8.0
2433.00	14.9	13.4	-0.5	2.0	-60.4	<=8.0
2433.05	14.3	13.4	-1.1	2.0	-61.0	<=8.0
2433.10	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2433.15	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2433.20	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2433.25	13.7	13.4	-1.7	2.0	-61.6	<=8.0
2433.30	14.0	13.4	-1.4	2.0	-61.3	<=8.0
2433.35	14.4	13.4	-1.0	2.0	-60.9	<=8.0
2433.40	15.1	13.4	-0.3	2.0	-60.2	<=8.0
2433.45	15.4	13.4	0.0	2.0	-59.9	<=8.0
2433.50	15.5	13.4	0.1	2.0	-59.8	<=8.0
2433.55	15.7	13.4	0.3	2.0	-59.6	<=8.0
2433.60	15.6	13.4	0.2	2.0	-59.7	<=8.0
2433.65	15.5	13.4	0.1	2.0	-59.8	<=8.0
2433.70	15.3	13.4	-0.1	2.0	-60.0	<=8.0
2433.75	15.1	13.4	-0.3	2.0	-60.2	<=8.0
2433.80	14.8	13.4	-0.6	2.0	-60.5	<=8.0
2433.85	14.6	13.4	-0.8	2.0	-60.7	<=8.0
2433.90	14.2	13.4	-1.2	2.0	-61.1	<=8.0
2433.95	14.1	13.4	-1.3	2.0	-61.2	<=8.0
2434.00	13.9	13.4	-1.5	2.0	-61.4	<=8.0
2434.05	13.8	13.4	-1.6	2.0	-61.5	<=8.0
2434.10	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2434.15	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2434.20	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.25	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.30	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2434.35	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.40	13.2	13.4	-2.2	2.0	-62.1	<=8.0
2434.45	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.50	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2434.55	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.60	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.65	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2434.70	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2434.75	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2434.80	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.85	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2434.90	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2434.95	13.7	13.4	-1.7	2.0	-61.6	<=8.0
2435.00	13.8	13.4	-1.6	2.0	-61.5	<=8.0
2435.05	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2435.10	13.1	13.4	-2.3	2.0	-62.2	<=8.0

2435.15	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2435.20	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2435.25	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2435.30	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2435.35	14.1	13.4	-1.3	2.0	-61.2	<=8.0
2435.40	13.9	13.4	-1.5	2.0	-61.4	<=8.0
2435.45	14.0	13.4	-1.4	2.0	-61.3	<=8.0
2435.50	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2435.55	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2435.60	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2435.65	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2435.70	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2435.75	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2435.80	13.2	13.4	-2.2	2.0	-62.1	<=8.0
2435.85	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2435.90	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2435.95	12.7	13.4	-2.7	2.0	-62.6	<=8.0
2436.00	12.8	13.4	-2.6	2.0	-62.5	<=8.0
2436.05	12.6	13.4	-2.8	2.0	-62.7	<=8.0
2436.10	12.4	13.4	-3.0	2.0	-62.9	<=8.0
2436.15	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2436.20	13.7	13.4	-1.7	2.0	-61.6	<=8.0
2436.25	13.9	13.4	-1.5	2.0	-61.4	<=8.0
2436.30	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2436.35	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2436.40	13.2	13.4	-2.2	2.0	-62.1	<=8.0
2436.45	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2436.50	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2436.55	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2436.60	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2436.65	12.6	13.4	-2.8	2.0	-62.7	<=8.0
2436.70	12.7	13.4	-2.7	2.0	-62.6	<=8.0
2436.75	12.8	13.4	-2.6	2.0	-62.5	<=8.0
2436.80	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2436.85	13.0	13.4	-2.4	2.0	-62.3	<=8.0
2436.90	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2436.95	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2437.00	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2437.05	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2437.10	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2437.15	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2437.20	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2437.25	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2437.30	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2437.35	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2437.40	13.1	13.4	-2.3	2.0	-62.2	<=8.0

2437.45	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2437.50	12.8	13.4	-2.6	2.0	-62.5	<=8.0
2437.55	13.0	13.4	-2.4	2.0	-62.3	<=8.0
2437.60	12.8	13.4	-2.6	2.0	-62.5	<=8.0
2437.65	13.0	13.4	-2.4	2.0	-62.3	<=8.0
2437.70	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2437.75	12.7	13.4	-2.7	2.0	-62.6	<=8.0
2437.80	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2437.85	13.0	13.4	-2.4	2.0	-62.3	<=8.0
2437.90	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2437.95	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2438.00	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2438.05	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2438.10	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2438.15	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2438.20	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2438.25	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2438.30	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2438.35	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2438.40	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2438.45	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2438.50	13.0	13.4	-2.4	2.0	-62.3	<=8.0
2438.55	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2438.60	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2438.65	13.2	13.4	-2.2	2.0	-62.1	<=8.0
2438.70	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2438.75	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2438.80	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2438.85	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2438.90	13.7	13.4	-1.7	2.0	-61.6	<=8.0
2438.95	13.8	13.4	-1.6	2.0	-61.5	<=8.0
2439.00	14.1	13.4	-1.3	2.0	-61.2	<=8.0
2439.05	14.0	13.4	-1.4	2.0	-61.3	<=8.0
2439.10	12.8	13.4	-2.6	2.0	-62.5	<=8.0
2439.15	12.7	13.4	-2.7	2.0	-62.6	<=8.0
2439.20	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2439.25	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2439.30	13.7	13.4	-1.7	2.0	-61.6	<=8.0
2439.35	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2439.40	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2439.45	13.3	13.4	-2.1	2.0	-62.0	<=8.0
2439.50	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2439.55	13.2	13.4	-2.2	2.0	-62.1	<=8.0
2439.60	13.4	13.4	-2.0	2.0	-61.9	<=8.0
2439.65	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2439.70	13.0	13.4	-2.4	2.0	-62.3	<=8.0

2439.75	13.2	13.4	-2.2	2.0	-62.1	<=8.0
2439.80	13.2	13.4	-2.2	2.0	-62.1	<=8.0
2439.85	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2439.90	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2439.95	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2440.00	12.9	13.4	-2.5	2.0	-62.4	<=8.0
2440.05	12.7	13.4	-2.7	2.0	-62.6	<=8.0
2440.10	13.0	13.4	-2.4	2.0	-62.3	<=8.0
2440.15	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2440.20	12.4	13.4	-3.0	2.0	-62.9	<=8.0
2440.25	11.6	13.4	-3.8	2.0	-63.7	<=8.0
2440.30	13.0	13.4	-2.4	2.0	-62.3	<=8.0
2440.35	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2440.40	14.0	13.4	-1.4	2.0	-61.3	<=8.0
2440.45	14.2	13.4	-1.2	2.0	-61.1	<=8.0
2440.50	14.4	13.4	-1.0	2.0	-60.9	<=8.0
2440.55	14.7	13.4	-0.7	2.0	-60.6	<=8.0
2440.60	14.8	13.4	-0.6	2.0	-60.5	<=8.0
2440.65	15.0	13.4	-0.4	2.0	-60.3	<=8.0
2440.70	15.2	13.4	-0.2	2.0	-60.1	<=8.0
2440.75	15.0	13.4	-0.4	2.0	-60.3	<=8.0
2440.80	14.9	13.4	-0.5	2.0	-60.4	<=8.0
2440.85	14.5	13.4	-0.9	2.0	-60.8	<=8.0
2440.90	14.3	13.4	-1.1	2.0	-61.0	<=8.0
2440.95	13.9	13.4	-1.5	2.0	-61.4	<=8.0
2441.00	13.8	13.4	-1.6	2.0	-61.5	<=8.0
2441.05	13.7	13.4	-1.7	2.0	-61.6	<=8.0
2441.10	13.1	13.4	-2.3	2.0	-62.2	<=8.0
2441.15	13.5	13.4	-1.9	2.0	-61.8	<=8.0
2441.20	13.7	13.4	-1.7	2.0	-61.6	<=8.0
2441.25	13.8	13.4	-1.6	2.0	-61.5	<=8.0
2441.30	13.6	13.4	-1.8	2.0	-61.7	<=8.0
2441.35	14.4	13.4	-1.0	2.0	-60.9	<=8.0
2441.40	14.6	13.4	-0.8	2.0	-60.7	<=8.0
2441.45	14.9	13.4	-0.5	2.0	-60.4	<=8.0
2441.50	15.3	13.4	-0.1	2.0	-60.0	<=8.0
2441.55	15.4	13.4	0.0	2.0	-59.9	<=8.0
2441.60	15.3	13.4	-0.1	2.0	-60.0	<=8.0
2441.65	15.8	13.4	0.4	2.0	-59.5	<=8.0
2441.70	16.2	13.4	0.8	2.0	-59.1	<=8.0
2441.75	16.0	13.4	0.6	2.0	-59.3	<=8.0
2441.80	15.9	13.4	0.5	2.0	-59.4	<=8.0
2441.85	15.8	13.4	0.4	2.0	-59.5	<=8.0
2441.90	15.6	13.4	0.2	2.0	-59.7	<=8.0
2441.95	15.4	13.4	0.0	2.0	-59.9	<=8.0
2442.00	15.1	13.4	-0.3	2.0	-60.2	<=8.0

2442.05	14.9	13.4	-0.5	2.0	-60.4	<=8.0
2442.10	14.7	13.4	-0.7	2.0	-60.6	<=8.0
2442.15	14.8	13.4	-0.6	2.0	-60.5	<=8.0
2442.20	14.8	13.4	-0.6	2.0	-60.5	<=8.0
2442.25	15.4	13.4	0.0	2.0	-59.9	<=8.0
2442.30	16.0	13.4	0.6	2.0	-59.3	<=8.0
2442.35	16.2	13.4	0.8	2.0	-59.1	<=8.0
2442.40	16.5	13.4	1.1	2.0	-58.8	<=8.0
2442.45	16.8	13.4	1.4	2.0	-58.5	<=8.0
2442.50	17.2	13.4	1.8	2.0	-58.1	<=8.0
2442.55	17.1	13.4	1.7	2.0	-58.2	<=8.0
2442.60	17.3	13.4	1.9	2.0	-58.0	<=8.0
2442.65	17.6	13.4	2.2	2.0	-57.7	<=8.0
2442.70	17.8	13.4	2.4	2.0	-57.5	<=8.0
2442.75	17.5	13.4	2.1	2.0	-57.8	<=8.0
2442.80	17.1	13.4	1.7	2.0	-58.2	<=8.0
2442.85	16.9	13.4	1.5	2.0	-58.4	<=8.0
2442.90	16.7	13.4	1.3	2.0	-58.6	<=8.0
2442.95	16.8	13.4	1.4	2.0	-58.5	<=8.0
2443.00	16.9	13.4	1.5	2.0	-58.4	<=8.0
2443.05	16.4	13.4	1.0	2.0	-58.9	<=8.0
2443.10	16.2	13.4	0.8	2.0	-59.1	<=8.0
2443.15	16.6	13.4	1.2	2.0	-58.7	<=8.0
2443.20	17.2	13.4	1.8	2.0	-58.1	<=8.0
2443.25	17.4	13.4	2.0	2.0	-57.9	<=8.0
2443.30	17.8	13.4	2.4	2.0	-57.5	<=8.0
2443.35	18.2	13.4	2.8	2.0	-57.1	<=8.0
2443.40	18.3	13.4	2.9	2.0	-57.0	<=8.0
2443.45	18.4	13.4	3.0	2.0	-56.9	<=8.0
2443.50	18.5	13.4	3.1	2.0	-56.8	<=8.0
2443.55	18.4	13.4	3.0	2.0	-56.9	<=8.0
2443.60	18.6	13.4	3.2	2.0	-56.7	<=8.0
2443.65	18.9	13.4	3.5	2.0	-56.4	<=8.0
2443.70	19.1	13.4	3.7	2.0	-56.2	<=8.0
2443.75	19.3	13.4	3.9	2.0	-56.0	<=8.0
2443.80	19.5	13.4	4.1	2.0	-55.8	<=8.0
2443.85	19.4	13.4	4.0	2.0	-55.9	<=8.0
2443.90	19.5	13.4	4.1	2.0	-55.8	<=8.0
2443.95	19.4	13.4	4.0	2.0	-55.9	<=8.0
2444.00	19.3	13.4	3.9	2.0	-56.0	<=8.0
2444.05	19.0	13.4	3.6	2.0	-56.3	<=8.0
2444.10	18.6	13.4	3.2	2.0	-56.7	<=8.0
2444.15	18.7	13.4	3.3	2.0	-56.6	<=8.0
2444.20	18.6	13.4	3.2	2.0	-56.7	<=8.0
2444.25	19.0	13.4	3.6	2.0	-56.3	<=8.0
2444.30	19.4	13.4	4.0	2.0	-55.9	<=8.0

2444.35	19.6	13.4	4.2	2.0	-55.7	<=8.0
2444.40	19.7	13.4	4.3	2.0	-55.6	<=8.0
2444.45	19.9	13.4	4.5	2.0	-55.4	<=8.0
2444.50	19.8	13.4	4.4	2.0	-55.5	<=8.0
2444.55	20.0	13.4	4.6	2.0	-55.3	<=8.0
2444.60	19.7	13.4	4.3	2.0	-55.6	<=8.0
2444.65	19.9	13.4	4.5	2.0	-55.4	<=8.0
2444.70	20.1	13.4	4.7	2.0	-55.2	<=8.0
2444.75	20.4	13.4	5.0	2.0	-54.9	<=8.0
2444.80	20.8	13.4	5.4	2.0	-54.5	<=8.0
2444.85	21.0	13.4	5.6	2.0	-54.3	<=8.0
2444.90	21.2	13.4	5.8	2.0	-54.1	<=8.0
2444.95	21.0	13.4	5.6	2.0	-54.3	<=8.0
2445.00	20.7	13.4	5.3	2.0	-54.6	<=8.0
2445.05	20.4	13.4	5.0	2.0	-54.9	<=8.0
2445.10	19.9	13.4	4.5	2.0	-55.4	<=8.0
2445.15	19.6	13.4	4.2	2.0	-55.7	<=8.0
2445.20	19.8	13.4	4.4	2.0	-55.5	<=8.0
2445.25	20.3	13.4	4.9	2.0	-55.0	<=8.0
2445.30	20.6	13.4	5.2	2.0	-54.7	<=8.0
2445.35	20.5	13.4	5.1	2.0	-54.8	<=8.0
2445.40	20.8	13.4	5.4	2.0	-54.5	<=8.0
2445.45	21.0	13.4	5.6	2.0	-54.3	<=8.0
2445.50	20.8	13.4	5.4	2.0	-54.5	<=8.0

6.14.4.4. Test Configuration #4: CCK, 11 Mbps

Modulation: CCK
Data Rate or Bit Rate: 11 Mb/s,
Symbol Rate: 1.375 MS/s
Chip Rate: 11 MC/s
Chip/Symbol Rate: 11:1.375 or 8

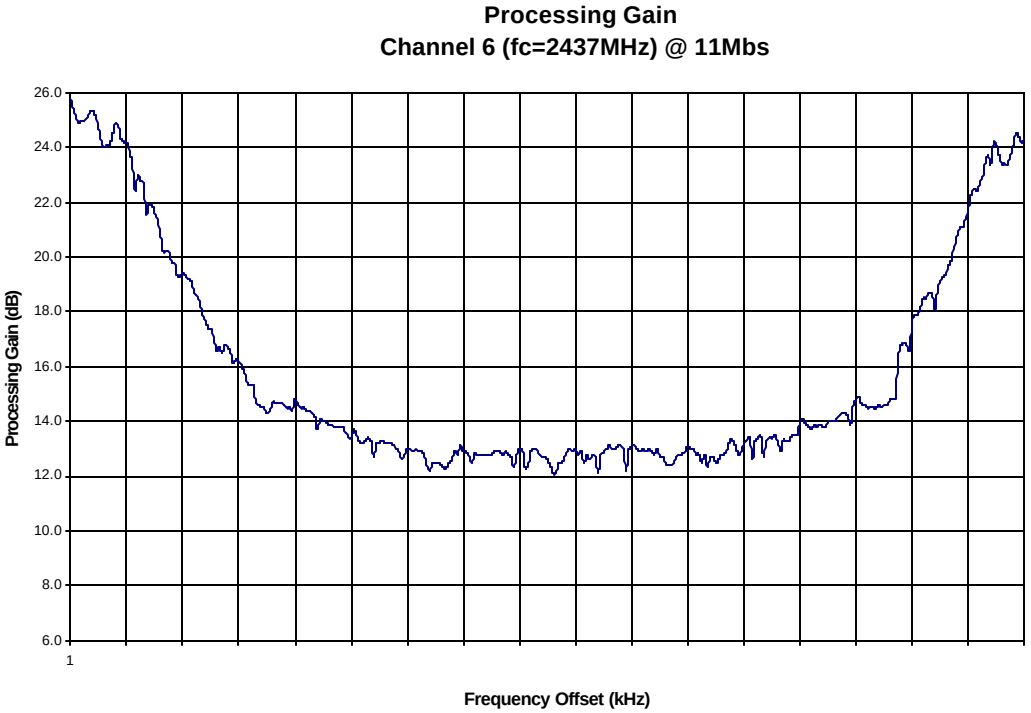
Theoretical Process Gain:

$$G_p = 18.4dB + \left(\frac{J}{S}\right) \geq 10dB$$

The minimum jammer to signal ratio is as follows:

$$\left(\frac{J}{S}\right) \geq -8.4\,dB$$

Measured Minimum Process Gain = 12.8 dB (after discarding 20% of the worst measurements)



CCK, 11 Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2428.50	25.8	16.4	7.4	2.0	-52.5	<=8.0
2428.55	25.4	16.4	7.0	2.0	-52.9	<=8.0
2428.60	25.1	16.4	6.7	2.0	-53.2	<=8.0
2428.65	24.9	16.4	6.5	2.0	-53.4	<=8.0
2428.70	25.0	16.4	6.6	2.0	-53.3	<=8.0
2428.75	25.0	16.4	6.6	2.0	-53.3	<=8.0
2428.80	25.1	16.4	6.7	2.0	-53.2	<=8.0
2428.85	25.3	16.4	6.9	2.0	-53.0	<=8.0
2428.90	25.3	16.4	6.9	2.0	-53.0	<=8.0
2428.95	25.1	16.4	6.7	2.0	-53.2	<=8.0
2429.00	24.7	16.4	6.3	2.0	-53.6	<=8.0
2429.05	24.2	16.4	5.8	2.0	-54.1	<=8.0
2429.10	24.0	16.4	5.6	2.0	-54.3	<=8.0
2429.15	24.1	16.4	5.7	2.0	-54.2	<=8.0
2429.20	24.1	16.4	5.7	2.0	-54.2	<=8.0
2429.25	24.5	16.4	6.1	2.0	-53.8	<=8.0
2429.30	24.9	16.4	6.5	2.0	-53.4	<=8.0
2429.35	24.8	16.4	6.4	2.0	-53.5	<=8.0
2429.40	24.3	16.4	5.9	2.0	-54.0	<=8.0
2429.45	24.2	16.4	5.8	2.0	-54.1	<=8.0
2429.50	24.2	16.4	5.8	2.0	-54.1	<=8.0
2429.55	23.8	16.4	5.4	2.0	-54.5	<=8.0
2429.60	23.5	16.4	5.1	2.0	-54.8	<=8.0
2429.65	22.4	16.4	4.0	2.0	-55.9	<=8.0
2429.70	23.0	16.4	4.6	2.0	-55.3	<=8.0
2429.75	22.8	16.4	4.4	2.0	-55.5	<=8.0
2429.80	22.7	16.4	4.3	2.0	-55.6	<=8.0
2429.85	21.6	16.4	3.2	2.0	-56.7	<=8.0
2429.90	21.9	16.4	3.5	2.0	-56.4	<=8.0
2429.95	21.9	16.4	3.5	2.0	-56.4	<=8.0
2430.00	21.6	16.4	3.2	2.0	-56.7	<=8.0
2430.05	21.3	16.4	2.9	2.0	-57.0	<=8.0
2430.10	20.8	16.4	2.4	2.0	-57.5	<=8.0
2430.15	20.2	16.4	1.8	2.0	-58.1	<=8.0
2430.20	20.2	16.4	1.8	2.0	-58.1	<=8.0
2430.25	20.2	16.4	1.8	2.0	-58.1	<=8.0
2430.30	19.8	16.4	1.4	2.0	-58.5	<=8.0
2430.35	19.8	16.4	1.4	2.0	-58.5	<=8.0
2430.40	19.3	16.4	0.9	2.0	-59.0	<=8.0
2430.45	19.3	16.4	0.9	2.0	-59.0	<=8.0
2430.50	19.4	16.4	1.0	2.0	-58.9	<=8.0

2430.55	19.3	16.4	0.9	2.0	-59.0	<=8.0
2430.60	19.2	16.4	0.8	2.0	-59.1	<=8.0
2430.65	19.1	16.4	0.7	2.0	-59.2	<=8.0
2430.70	18.7	16.4	0.3	2.0	-59.6	<=8.0
2430.75	18.6	16.4	0.2	2.0	-59.7	<=8.0
2430.80	18.3	16.4	-0.1	2.0	-60.0	<=8.0
2430.85	17.9	16.4	-0.5	2.0	-60.4	<=8.0
2430.90	17.7	16.4	-0.7	2.0	-60.6	<=8.0
2430.95	17.4	16.4	-1.0	2.0	-60.9	<=8.0
2431.00	17.4	16.4	-1.0	2.0	-60.9	<=8.0
2431.05	17.0	16.4	-1.4	2.0	-61.3	<=8.0
2431.10	16.6	16.4	-1.8	2.0	-61.7	<=8.0
2431.15	16.7	16.4	-1.7	2.0	-61.6	<=8.0
2431.20	16.5	16.4	-1.9	2.0	-61.8	<=8.0
2431.25	16.8	16.4	-1.6	2.0	-61.5	<=8.0
2431.30	16.7	16.4	-1.7	2.0	-61.6	<=8.0
2431.35	16.5	16.4	-1.9	2.0	-61.8	<=8.0
2431.40	16.1	16.4	-2.3	2.0	-62.2	<=8.0
2431.45	16.3	16.4	-2.1	2.0	-62.0	<=8.0
2431.50	16.2	16.4	-2.2	2.0	-62.1	<=8.0
2431.55	16.0	16.4	-2.4	2.0	-62.3	<=8.0
2431.60	15.8	16.4	-2.6	2.0	-62.5	<=8.0
2431.65	15.4	16.4	-3.0	2.0	-62.9	<=8.0
2431.70	15.3	16.4	-3.1	2.0	-63.0	<=8.0
2431.75	15.3	16.4	-3.1	2.0	-63.0	<=8.0
2431.80	14.7	16.4	-3.7	2.0	-63.6	<=8.0
2431.85	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2431.90	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2431.95	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2432.00	14.3	16.4	-4.1	2.0	-64.0	<=8.0
2432.05	14.4	16.4	-4.0	2.0	-63.9	<=8.0
2432.10	14.7	16.4	-3.7	2.0	-63.6	<=8.0
2432.15	14.7	16.4	-3.7	2.0	-63.6	<=8.0
2432.20	14.7	16.4	-3.7	2.0	-63.6	<=8.0
2432.25	14.7	16.4	-3.7	2.0	-63.6	<=8.0
2432.30	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2432.35	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2432.40	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2432.45	14.4	16.4	-4.0	2.0	-63.9	<=8.0
2432.50	14.8	16.4	-3.6	2.0	-63.5	<=8.0
2432.55	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2432.60	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2432.65	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2432.70	14.4	16.4	-4.0	2.0	-63.9	<=8.0
2432.75	14.4	16.4	-4.0	2.0	-63.9	<=8.0
2432.80	14.3	16.4	-4.1	2.0	-64.0	<=8.0

2432.85	14.2	16.4	-4.2	2.0	-64.1	<=8.0
2432.90	13.7	16.4	-4.7	2.0	-64.6	<=8.0
2432.95	14.1	16.4	-4.3	2.0	-64.2	<=8.0
2433.00	14.0	16.4	-4.4	2.0	-64.3	<=8.0
2433.05	14.0	16.4	-4.4	2.0	-64.3	<=8.0
2433.10	13.9	16.4	-4.5	2.0	-64.4	<=8.0
2433.15	13.9	16.4	-4.5	2.0	-64.4	<=8.0
2433.20	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2433.25	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2433.30	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2433.35	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2433.40	13.6	16.4	-4.8	2.0	-64.7	<=8.0
2433.45	13.4	16.4	-5.0	2.0	-64.9	<=8.0
2433.50	13.4	16.4	-5.0	2.0	-64.9	<=8.0
2433.55	13.7	16.4	-4.7	2.0	-64.6	<=8.0
2433.60	13.5	16.4	-4.9	2.0	-64.8	<=8.0
2433.65	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2433.70	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2433.75	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2433.80	13.4	16.4	-5.0	2.0	-64.9	<=8.0
2433.85	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2433.90	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2433.95	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2434.00	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2434.05	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2434.10	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2434.15	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2434.20	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2434.25	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2434.30	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2434.35	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2434.40	12.6	16.4	-5.8	2.0	-65.7	<=8.0
2434.45	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2434.50	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2434.55	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2434.60	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2434.65	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2434.70	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2434.75	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2434.80	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2434.85	12.4	16.4	-6.0	2.0	-65.9	<=8.0
2434.90	12.2	16.4	-6.2	2.0	-66.1	<=8.0
2434.95	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2435.00	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2435.05	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2435.10	12.4	16.4	-6.0	2.0	-65.9	<=8.0

2435.15	12.3	16.4	-6.1	2.0	-66.0	<=8.0
2435.20	12.3	16.4	-6.1	2.0	-66.0	<=8.0
2435.25	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2435.30	12.6	16.4	-5.8	2.0	-65.7	<=8.0
2435.35	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2435.40	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2435.45	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2435.50	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2435.55	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2435.60	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2435.65	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2435.70	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2435.75	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2435.80	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2435.85	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2435.90	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2435.95	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2436.00	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2436.05	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2436.10	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2436.15	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2436.20	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2436.25	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2436.30	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2436.35	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2436.40	12.3	16.4	-6.1	2.0	-66.0	<=8.0
2436.45	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2436.50	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2436.55	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2436.60	12.3	16.4	-6.1	2.0	-66.0	<=8.0
2436.65	12.4	16.4	-6.0	2.0	-65.9	<=8.0
2436.70	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2436.75	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2436.80	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2436.85	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2436.90	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2436.95	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2437.00	12.6	16.4	-5.8	2.0	-65.7	<=8.0
2437.05	12.4	16.4	-6.0	2.0	-65.9	<=8.0
2437.10	12.1	16.4	-6.3	2.0	-66.2	<=8.0
2437.15	12.1	16.4	-6.3	2.0	-66.2	<=8.0
2437.20	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2437.25	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2437.30	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2437.35	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2437.40	13.0	16.4	-5.4	2.0	-65.3	<=8.0

2437.45	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2437.50	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2437.55	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2437.60	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2437.65	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2437.70	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2437.75	12.6	16.4	-5.8	2.0	-65.7	<=8.0
2437.80	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2437.85	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2437.90	12.1	16.4	-6.3	2.0	-66.2	<=8.0
2437.95	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2438.00	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2438.05	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.10	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2438.15	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.20	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.25	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2438.30	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2438.35	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.40	12.2	16.4	-6.2	2.0	-66.1	<=8.0
2438.45	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.50	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2438.55	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2438.60	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.65	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2438.70	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.75	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2438.80	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2438.85	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2438.90	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2438.95	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2439.00	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2439.05	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2439.10	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2439.15	12.4	16.4	-6.0	2.0	-65.9	<=8.0
2439.20	12.4	16.4	-6.0	2.0	-65.9	<=8.0
2439.25	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2439.30	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2439.35	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2439.40	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2439.45	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2439.50	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2439.55	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2439.60	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2439.65	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2439.70	12.8	16.4	-5.6	2.0	-65.5	<=8.0

2439.75	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2439.80	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2439.85	12.3	16.4	-6.1	2.0	-66.0	<=8.0
2439.90	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2439.95	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2440.00	12.5	16.4	-5.9	2.0	-65.8	<=8.0
2440.05	12.6	16.4	-5.8	2.0	-65.7	<=8.0
2440.10	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2440.15	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2440.20	13.0	16.4	-5.4	2.0	-65.3	<=8.0
2440.25	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2440.30	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2440.35	13.1	16.4	-5.3	2.0	-65.2	<=8.0
2440.40	12.8	16.4	-5.6	2.0	-65.5	<=8.0
2440.45	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2440.50	13.2	16.4	-5.2	2.0	-65.1	<=8.0
2440.55	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2440.60	13.4	16.4	-5.0	2.0	-64.9	<=8.0
2440.65	12.6	16.4	-5.8	2.0	-65.7	<=8.0
2440.70	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2440.75	13.4	16.4	-5.0	2.0	-64.9	<=8.0
2440.80	13.5	16.4	-4.9	2.0	-64.8	<=8.0
2440.85	12.7	16.4	-5.7	2.0	-65.6	<=8.0
2440.90	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2440.95	13.4	16.4	-5.0	2.0	-64.9	<=8.0
2441.00	13.4	16.4	-5.0	2.0	-64.9	<=8.0
2441.05	13.5	16.4	-4.9	2.0	-64.8	<=8.0
2441.10	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2441.15	12.9	16.4	-5.5	2.0	-65.4	<=8.0
2441.20	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2441.25	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2441.30	13.3	16.4	-5.1	2.0	-65.0	<=8.0
2441.35	13.5	16.4	-4.9	2.0	-64.8	<=8.0
2441.40	13.5	16.4	-4.9	2.0	-64.8	<=8.0
2441.45	13.5	16.4	-4.9	2.0	-64.8	<=8.0
2441.50	14.0	16.4	-4.4	2.0	-64.3	<=8.0
2441.55	14.1	16.4	-4.3	2.0	-64.2	<=8.0
2441.60	13.9	16.4	-4.5	2.0	-64.4	<=8.0
2441.65	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2441.70	13.7	16.4	-4.7	2.0	-64.6	<=8.0
2441.75	13.9	16.4	-4.5	2.0	-64.4	<=8.0
2441.80	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2441.85	13.9	16.4	-4.5	2.0	-64.4	<=8.0
2441.90	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2441.95	13.8	16.4	-4.6	2.0	-64.5	<=8.0
2442.00	14.0	16.4	-4.4	2.0	-64.3	<=8.0

2442.05	14.0	16.4	-4.4	2.0	-64.3	<=8.0
2442.10	14.0	16.4	-4.4	2.0	-64.3	<=8.0
2442.15	14.1	16.4	-4.3	2.0	-64.2	<=8.0
2442.20	14.2	16.4	-4.2	2.0	-64.1	<=8.0
2442.25	14.3	16.4	-4.1	2.0	-64.0	<=8.0
2442.30	14.3	16.4	-4.1	2.0	-64.0	<=8.0
2442.35	14.2	16.4	-4.2	2.0	-64.1	<=8.0
2442.40	13.9	16.4	-4.5	2.0	-64.4	<=8.0
2442.45	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2442.50	14.8	16.4	-3.6	2.0	-63.5	<=8.0
2442.55	14.9	16.4	-3.5	2.0	-63.4	<=8.0
2442.60	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2442.65	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2442.70	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2442.75	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2442.80	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2442.85	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2442.90	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2442.95	14.5	16.4	-3.9	2.0	-63.8	<=8.0
2443.00	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2443.05	14.6	16.4	-3.8	2.0	-63.7	<=8.0
2443.10	14.8	16.4	-3.6	2.0	-63.5	<=8.0
2443.15	14.8	16.4	-3.6	2.0	-63.5	<=8.0
2443.20	14.9	16.4	-3.5	2.0	-63.4	<=8.0
2443.25	16.3	16.4	-2.1	2.0	-62.0	<=8.0
2443.30	16.8	16.4	-1.6	2.0	-61.5	<=8.0
2443.35	16.9	16.4	-1.5	2.0	-61.4	<=8.0
2443.40	16.8	16.4	-1.6	2.0	-61.5	<=8.0
2443.45	16.6	16.4	-1.8	2.0	-61.7	<=8.0
2443.50	17.6	16.4	-0.8	2.0	-60.7	<=8.0
2443.55	17.9	16.4	-0.5	2.0	-60.4	<=8.0
2443.60	17.9	16.4	-0.5	2.0	-60.4	<=8.0
2443.65	18.2	16.4	-0.2	2.0	-60.1	<=8.0
2443.70	18.5	16.4	0.1	2.0	-59.8	<=8.0
2443.75	18.5	16.4	0.1	2.0	-59.8	<=8.0
2443.80	18.7	16.4	0.3	2.0	-59.6	<=8.0
2443.85	18.7	16.4	0.3	2.0	-59.6	<=8.0
2443.90	18.1	16.4	-0.3	2.0	-60.2	<=8.0
2443.95	18.8	16.4	0.4	2.0	-59.5	<=8.0
2444.00	19.1	16.4	0.7	2.0	-59.2	<=8.0
2444.05	19.3	16.4	0.9	2.0	-59.0	<=8.0
2444.10	19.4	16.4	1.0	2.0	-58.9	<=8.0
2444.15	19.7	16.4	1.3	2.0	-58.6	<=8.0
2444.20	19.9	16.4	1.5	2.0	-58.4	<=8.0
2444.25	20.4	16.4	2.0	2.0	-57.9	<=8.0
2444.30	20.8	16.4	2.4	2.0	-57.5	<=8.0

2444.35	21.1	16.4	2.7	2.0	-57.2	<=8.0
2444.40	21.1	16.4	2.7	2.0	-57.2	<=8.0
2444.45	21.4	16.4	3.0	2.0	-56.9	<=8.0
2444.50	21.8	16.4	3.4	2.0	-56.5	<=8.0
2444.55	22.3	16.4	3.9	2.0	-56.0	<=8.0
2444.60	22.5	16.4	4.1	2.0	-55.8	<=8.0
2444.65	22.4	16.4	4.0	2.0	-55.9	<=8.0
2444.70	22.7	16.4	4.3	2.0	-55.6	<=8.0
2444.75	22.9	16.4	4.5	2.0	-55.4	<=8.0
2444.80	23.4	16.4	5.0	2.0	-54.9	<=8.0
2444.85	23.7	16.4	5.3	2.0	-54.6	<=8.0
2444.90	23.4	16.4	5.0	2.0	-54.9	<=8.0
2444.95	24.2	16.4	5.8	2.0	-54.1	<=8.0
2445.00	24.1	16.4	5.7	2.0	-54.2	<=8.0
2445.05	23.7	16.4	5.3	2.0	-54.6	<=8.0
2445.10	23.4	16.4	5.0	2.0	-54.9	<=8.0
2445.15	23.4	16.4	5.0	2.0	-54.9	<=8.0
2445.20	23.4	16.4	5.0	2.0	-54.9	<=8.0
2445.25	23.7	16.4	5.3	2.0	-54.6	<=8.0
2445.30	24.1	16.4	5.7	2.0	-54.2	<=8.0
2445.35	24.5	16.4	6.1	2.0	-53.8	<=8.0
2445.40	24.4	16.4	6.0	2.0	-53.9	<=8.0
2445.45	24.2	16.4	5.8	2.0	-54.1	<=8.0
2445.50	24.3	16.4	5.9	2.0	-54.0	<=8.0

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994)

7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Line Conducted)	PROBABILITY DISTRIBUTION	UNCERTAINTY (dB) 9-150 kHz	UNCERTAINTY (dB) 0.15-30 MHz
EMI Receiver specification	Rectangular	±1.5	±1.5
LISN coupling specification	Rectangular	±1.5	±1.5
Cable and Input Transient Limiter calibration	Normal (k=2)	±0.3	±0.5
Mismatch: Receiver VRC $\Gamma_1 = 0.03$ LISN VRC $\Gamma_R = 0.8$(9 kHz) 0.2 (30 MHz) Uncertainty limits $20\text{Log}(1\pm\Gamma_1\Gamma_R)$	U-Shaped	±0.2	±0.3
System repeatability	Std. deviation	±0.2	±0.05
Repeatability of EUT	--	--	--
Combined standard uncertainty	Normal	±1.25	±1.30
Expanded uncertainty U	Normal (k=2)	±2.50	±2.60

Sample Calculation for Measurement Accuracy in 450 kHz to 30 MHz Band:

$$u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)} = \pm \sqrt{(1.5^2 + 1.5^2)/3 + (0.5/2)^2 + (0.05/2)^2 + 0.35^2} = \pm 1.30 \text{ dB}$$

$$U = 2u_c(y) = \pm 2.6 \text{ dB}$$

7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Radiated Emissions)	PROBABILITY DISTRIBUTION	UNCERTAINTY (± dB)	
		3 m	10 m
Antenna Factor Calibration	Normal (k=2)	±1.0	±1.0
Cable Loss Calibration	Normal (k=2)	±0.3	±0.5
EMI Receiver specification	Rectangular	±1.5	±1.5
Antenna Directivit	Rectangular	+0.5	+0.5
Antenna factor variation with height	Rectangular	±2.0	±0.5
Antenna phase center variation	Rectangular	0.0	±0.2
Antenna factor frequency interpolation	Rectangular	±0.25	±0.25
Measurement distance variation	Rectangular	±0.6	±0.4
Site imperfections	Rectangular	±2.0	±2.0
Mismatch: Receiver VRC $\Gamma_1 = 0.2$ Antenna VRC $\Gamma_R = 0.67$(Bi) 0.3 (Lp) Uncertainty limits $20\text{Log}(1\pm\Gamma_1\Gamma_R)$	U-Shaped	+1.1 -1.25	±0.5
System repeatability	Std. Deviation	±0.5	±0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+2.19 / -2.21	+1.74 / -1.72
Expanded uncertainty U	Normal (k=2)	+4.38 / -4.42	+3.48 / -3.44

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k=2 is used:

$U = 2u_c(y) = 2x(+2.19) = +4.38$ dB And $U = 2u_c(y) = 2x(-2.21) = -4.42$ dB

EXHIBIT 8. MEASUREMENT METHODS

8.1. GENERAL TEST CONDITIONS

The following test conditions shall be applied throughout the tests covered in this report.

8.1.1. Normal temperature and humidity

- Normal temperature: +15°C to +35°C
- Relative Humidity: +20% to 75%

The actual values during tests shall be recorded in the test report.

8.1.2. Normal power source

8.1.2.1. Mains Voltage

The nominal test voltage of the equipment to be connected to mains shall be the nominal mains voltage which is the declared voltage or any of the declared voltages for which the equipment was designed.

The frequency of test power source corresponding to the AC mains shall be between 59 Hz and 61 Hz.

8.1.2.2. Battery Power Source.

For operation from battery power sources, the nominal test voltage shall be as declared by the equipment manufacturer. This shall be recorded in the test report.

8.1.3. Operating Condition of Equipment under Test

- All tests were carried out while the equipment operated at the following frequencies:
  - The lowest operating frequency,
  - The middle operating frequency and
  - The highest operating frequency

- Modulation were applied using the Test Data sequence
- The transmitter was operated at the highest output power, or in the case the equipment able to operate at more than one power level, at the lowest and highest output powers

8.2. METHOD OF MEASUREMENTS - AC MAINS CONDUCTED EMISSIONS

- AC Mains conducted emissions measurements were performed in accordance with the standard against appropriate limits for each detector function.
- The test was performed in the shielded room, 16'(L) by 16'(W) by 12'(H).
- The test was performed were made over the frequency range from 450 kHz to 30 MHz to determine the line-to-ground radio noise voltage which was conducted from the EUT power-input terminals that were directly connected to a public power network.
- The EUT normally received power from another device that connects to the public utility ac power lines, measurements would be made on that device with the EUT in operation to ensure that the device continues to comply with the appropriate limits while providing the EUT with power.
- If the EUT operates only from internal or dedicated batteries, with no provisions for connection to the public utility ac power lines, AC Mains conducted measurements are not required.
- Table-top devices were placed on a platform of nominal size 1 m by 1.5m raised 80 cm above the conducting ground plane.
- The EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the power source. All unused 50-Ohm connectors of the LISN was terminated in 50-ohm when not connected to the measuring instruments.
- The line cord of the EUT connected to one LISN which was connected to the measuring instrument. Those power cords for the units of devices not under measurement were connected to a separate multiple ac outlet. Drawings and photographs of typically conducted emission test setups were shown in the Test Report. Each current-carrying conductor of the EUT shall be individually tested.
- The EUT was normally operated with a ground (safety) connection, the EUT was connected to the ground at the LISN through a conductor provided in the lead from the ac power mains to the LISN.
- The excess length of the power cord was folded back and forth in an 8-shape on a wooden strip with a vertical prong located on the top of the LISN case.
- The EUT was set-up in its typical configuration and operated in its various modes as described in 3.2 of the test report.
- A preliminary scan was made by using spectrum analyzer system with the detector function set to PEAK mode (9 KHz RBW, VBW > RBW), frequency span 450 kHz to 30 MHz.

- The maximum conducted emission for a given mode of operation was found by using the following step-by-step procedure:

  Step1. Monitor the frequency range of interest at a fixed EUT azimuth.

  Step2. Manipulate the system cables and peripheral devices to produce highest amplitude signal relative to the limit. Note the amplitude and frequency of the suspect signal.

  Step3. The effects of various modes of operation is examined. This is done by varying equipment operation modes as step 2 is being performed.

  Step4. After completing step 1 through 3, record EUT and peripheral device configuration, mode of operation, cable configuration, signal levels and frequencies for final test.

- Each highest signal level at the maximized test configuration was zoomed in a small frequency span on the spectrum analyzer's display (the manipulation of cables and peripheral devices and EUT operation modes might have to be repeated to obtain the highest signal level with the spectrum analyzer set to PEAK detector mode 10 KHz RBW and VBW > RBW). The spectrum analyzer was then set to CISPR QUASI-PEAK detector mode (9 KHz RBW, 1 MHz VBW) and AVERAGE detector mode (10 kHz RBW, 1 Hz VBW). The final highest RF signal levels and frequencies were record.

- ***Broad-band ac Powerline conducted emissions***:- If the EUT exhibits ac Powerline conducted emissions that exceed the limit with the instrument set to the quasi-peak mode, then measurements should be made in the average mode. If the amplitude measured in the quasi-peak mode is at least 6 dB higher than the amplitude measured in the average mode, the level measured in quasi peak mode may be reduced by 13 dB before comparing it to the limit.

8.3. EFFECTIVE RADIATED POWER

- The following shall be applied to the combination(s) of the radio device and its intended antenna(e).
- I f the RF level is user adjustable, all measurements shall be made with the highest power level available to the user for that combination.
- The following method of measurement shall apply to both conducted and radiated measurements.
- The radiated measurements are performed at the Ultratech Calibrated Open Field Test Site.
- The measurement shall be performed using normal operation of the equipment with modulation.

Test procedure shall be as follows:

Step 1: Duty Cycle measurements

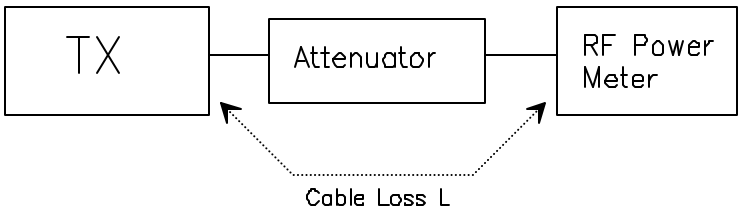
- Using a spectrum analyzer with the frequency span set to 0 Hz and the sweep time set at a suitable value to capture the envelope peaks and the duty cycle of the transmitter output signal;
- The duty cycle of the transmitter, x = Tx on / (Tx on + Tx off) with $0<x<1$, is measure and recorded in the test report. For the purpose of testing, the equipment shall be operated with a duty cycle that is equal or more than 0.1.

Step 2: Calculation of Peak and Average EIRP

- The peak output power of the transmitter shall be determined using a wideband, calibrated RF Peak Power Meter with the power sensor with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "P" (in dBm);
- The Average EIRP. shall be calculated from the above measured power output "A", the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:

Peak EIRP = P + G
Average EIRP = Peak EIRP + 10log(1/x)

Figure 1.



Step 3: Substitution Method. See Figure 2

(a) The measurements was performed in the absence of modulation (un-modulated)
(b) Test was performed at listed 3m open area test site (listed with FCC, IC, ITI, NVLAP, ACA & VCCI).
(c) The transmitter under test was placed at the specified height on a non-conducting turntable (80 cm height)
(d) The dipole test antenna was used and tuned to the transmitter carrier frequency.
(e) The spectrum analyzer was tuned to transmitter carrier frequency. The test antenna was lowered or raised from 1 to 4 meters until the maximum signal level was detected.
(f) The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.

(g) The test antenna was lowered or raised again from 1 to 4 meters until a maximum was obtained. This level was recorded.
(h) The substitution dipole antenna and the signal generator replaced the transmitter and antenna under test in the same position, and the substitution dipole antenna was placed in vertical polarization. The test dipole antenna was lowered or raised as necessary to ensure that the maximum signal is stilled received.
(i) The input signal to the substitution antenna was adjusted in level until an equal or a known related level to that detected from the transmitter was obtained in the test receiver. The maximum carrier radiated power is equal to the power supply by the generator.
(j) The substitution antenna gain and cable loss were added to the signal generator level for the corrected ERP level.
(k) Repeat steps (c) to (j) with the substitution antenna oriented in horizontal polarization.
(l) Actual gain of the EUT's antenna is the difference of the measured ERP and measured RF power at the RF port. Correct the antenna gain if necessary.

Figure 2

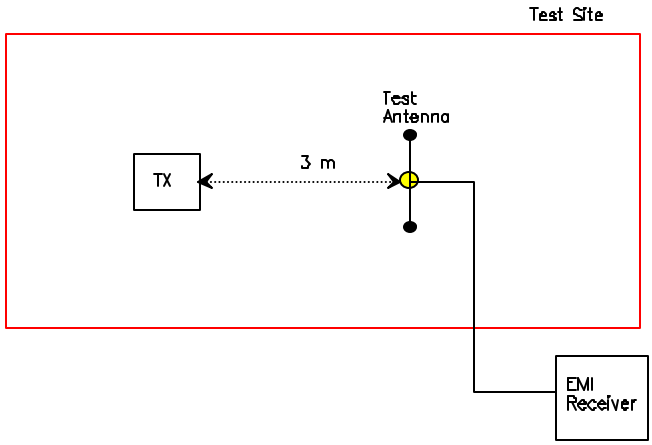
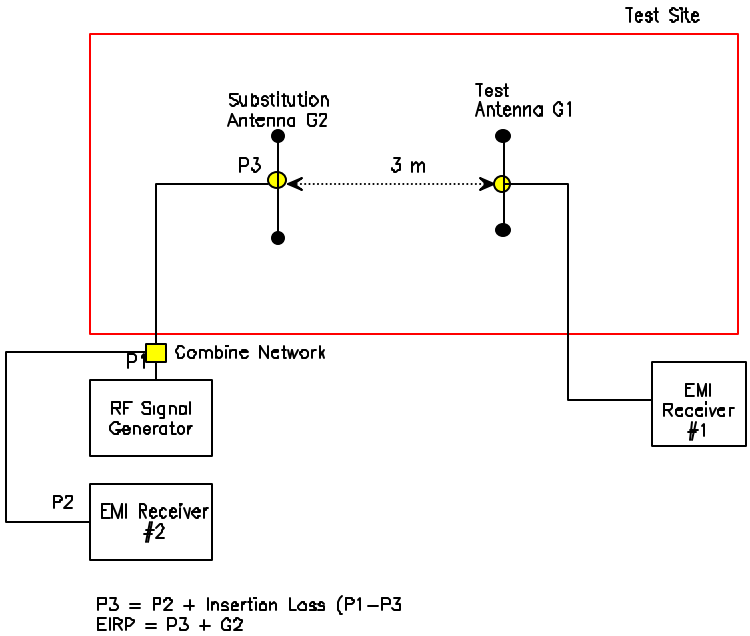


Figure 3



Use the following spectrum analyzer settings:

- Span = approximately 5 times the 20 dB BW, centered on a center of the channel frequency
- RBW > 20 dB BW of the emission measured
- VBW = RBW
- Trace = max hold
- Allow the trace to stabilize
- Use the marker-to-marker function to set the marker to the peak of the emission.
- The indicated level is the peak output power (with the addition of the external attenuation and cable loss).
- The limit is specified in one of the subparagraph of this Section.
- Submit this plot.
- A peak responding power meter may be used instead of a spectrum analyzer.

8.4. SPURIOUS EMISSIONS (CONDUCTED & RADIATED)

For both conducted and radiated measurements, the spurious emissions were scanned from the lowest frequency generated by the EUT or 10 MHz whichever is lower to 10^{th} harmonic of the highest frequency generated by the EUT.

8.4.1. Band-edge and Spurious Emissions (Conducted)

Band-edge Compliance of RF Conducted Emissions:

Use the following spectrum analyzer settings:

- The radio was connected to the measuring equipment via a suitable attenuator.
- Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
- RBW = 1 % of the span
- VBW = RBW
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize
- Set the marker on the emission at the band-edge, or on the highest modulation product outside of the band, if this level is greater than that at the band-edge
- Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission.
- The marker-delta value now displayed must comply with the limit specified
- Submit this plot

Spurious RF Conducted Emissions:
Use the following spectrum analyzer settings:

- The radio was connected to the measuring equipment via a suitable attenuator.
- Span = wide enough to capture the peak level of the in-band-emission and all spurious emissions (e.g. harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, sevral plots are required to cover this entire span.
- RBW = 100 kHz
- VBW = RBW
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize
- Set the marker on the any spurious emission recorded. The level displayed must comply with the limit specified in this Section.
- Submit this plot

8.4.2. Spurious Emissions (Radiated)

- The radiated emission measurements were performed at the UltraTech's 3 Meter Open Field Test Site (OFTS) situated in the Town of Oakville, province of Ontario. The Attenuation Characteristics of OFTS have been filed to FCC, Industry Canada, ACA/Austel, NVLap and ITI.
- Radiated emissions measurements were made using the following test instruments:

1. Calibrated EMCO BiconiLog antenna in the frequency range from 30 MHz to 2000 MHz.
2. Calibrated Emco Horn antennas in the frequency range above 1000 MHz (1GHz - 40 GHz).
3. The test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

   - RBW = 100 kHz for f < 1GHz and RBW = 1 MHz for f $\geq$ 1 GHz
   - VBW = RBW
   - Sweep = auto
   - Detector function = peak
   - Trace = max hold
   - Follows the guidelines in ANSI C63.4-1992 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc.. A pre-amp and highpass filter are required for this test, in order to provide the measuring system with sufficient sensitivity.
   - Allow the trace to stabilize.
   - The peak reading of the emission, after being corrected by the antenna correction factor, cable loss, pre-amp gain, etc…. is the peak field strength which comply with the limit specified in Section 15.35(b)

   Calculation of Field Strength:

   The field strength is calculated by adding the calibrated antenna factor and cable factor, and subtracting the Amplifier gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where	FS	=	Field Strength
	RA	=	Receiver/Analyzer Reading
	AF	=	Antenna Factor
	CF	=	Cable Attenuation Factor
	AG	=	Amplifier Gain

Example: If a receiver reading of 60.0 dBuV is obtained, the antenna factor of 7.0 dB/m and cable factor of 1.0 dB are added, and the amplifier gain of 30 dB is subtracted. The actual field strength will be:

Field Level = 60 + 7.0 + 1.0 - 30 = 38.0 dBuV/m.
Field Level = $10^{(38/20)}$ = 79.43 uV/m.

- Submit this test data
- Now set the VBW to 10Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time of the each channel is less than 100ms, then the reading obtained may be further adjusted by a "duty cycle correction factor", derived from 10log(dwell time/100mS) in an effort to demonstrate compliance with the 15.209.
- Submit test data

Maximizing The Radiated Emissions:

- The frequencies of emissions was first detected. Then the amplitude of the emissions was measured at the specified measurement distance using required antenna height, polarization, and detector characteristics.
- During this process, cables and peripheral devices were manipulated within the range of likely configuration.
- For each mode of operation required to be tested, the frequency spectrum was monitored. Variations in antenna heights (from 1 meter to 4 meters above the ground plane), antenna polarization (horizontal plane and vertical plane), cable placement and peripheral placement were explored to produce the highest amplitude signal relative to the limit.

The maximum radiated emission for a given mode of operation was found by using the following step-by-step procedure:

Step1: Monitor the frequency range of interest at a fixed antenna height and EUT azimuth.

Step2: Manipulate the system cables to produce highest amplitude signal relative to the limit. Note the amplitude and frequency of the suspect signal.

Step3: Rotate the EUT 360 degrees to maximize the suspected highest amplitude signal. If the signal or another at a different frequency is observed to exceed the previously noted highest amplitude signal by 1 dB or more, go back to the azimuth and repeat Step 2. Otherwise, orient the EUT azimuth to repeat the highest amplitude observation and proceed.

Step4: Move the antenna over its full allowable range of travel (1 to 4 meters) to maximize the suspected highest amplitude signal. If the signal or another at a different frequency is observed to exceed the previously noted highest amplitude signal by 1 dB or more, return to Step 2 with the highest amplitude observation and proceed.

Step5: Change the polarization of the antenna and repeat Step 2 through 4. Compare the resulting suspected highest amplitude signal with that found for the other polarization. Select and note the higher of the two signals. This signal is termed the highest observed signal with respect to the limit for this EUT operational mode.

Step6: The effects of various modes of operation is examined. This is done by varying the equipment modes as steps 2 through 5 are being performed.

Step7: After completing steps 1 through 6, record the final highest emission level, frequency, antenna polarization and detector mode of the measuring instrument.

8.5. ALTERNATIVE TEST PROCEDURES

If the antenna conducted tests cannot be performed on this device, radiated tests show compliance with the peak output power limit specified in Section 15.247(b) and the spurious RF conducted emission limit specified in Section 15.247(c) are acceptable. As stated previously, a pre-amp, and, in the later case, a high pass filter, are required for the following measurements:

8.5.1. Peak Power Measurements

Calculate the transmitter's peak power using the following equation:

$E = 30PG/d$
$P = (Ed)^2/30G$

Where:

- E: measured maximum fundamental field strength in V/m. Utilizing a RBW, the 20 dB bandwidth of the emission VBW >RBW, peak detector function. Follow the procedures in C63.4-1992 with respect to maximizing the emission
- G is numeric gain of the transmitting antenna with reference to an isotropic radiator
- D is the distance in meters from which the field strength was measured
- P is the distance in meters from which the field strength was measured

8.5.2. Spurious RF conducted emissions

The demonstrate compliance with the spurious RF conducted emission requirement of Section 15.247©, use the following spectrum analyzer settings:

- Span = wide enough to fully capture the emission being measured
- RBW = 100 kHz
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Measure the field strength of both the fundamental and all spurious emissions with these settings.
- Follow the procedures C62-4:1994 with respect to maximizing the emissions. The measured field strength of all spurious emissions must be below the measured field strength of the fundamental emission by the amount specified in Section 15.247©. Note that if the emission falls in a Restricted Band, as defined in Section 15.205, the procedure for measuring spurious radiated emissions listed above must be followed

8.6. TRANSMITTED POWER DENSITY OF A DSSS SYSTEM

- The radio was connected to the measuring equipment via a suitable attenuator.
- Locate and zoom in on emission peak(s) within the passband
- The spectrum analyzer were used and set as follows:

  - Resolution BW: 3 kHz
  - Video BW: same or greater
  - Detector Mode: Normal
  - Averaging: Off
  - Span: 3 MHz
  - Amplitude: Adjust for middle of the instrument's range
  - Sweep Time: 1000 seconds

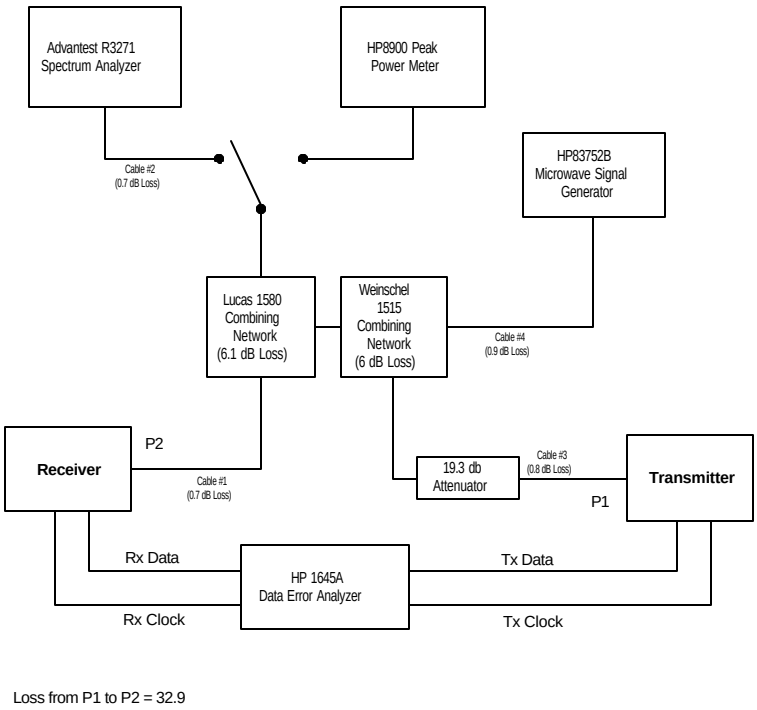
- Locate and zoom in on emission peak(s) within the passband. Set RBW = 3 KHz, VBW $\geq$ RBW, Sweep = SPAN/3 KHz. For example, a span of 1.5 MHz, the sweep should be $1.6x10^6/3.0x10^3$= 500 seconds. The measured peak level must be no greater than +8 dBm.
- For devices with spectrum line spacing greater than 3 KHz no change is required.
- For devices with spectrum line spacing equal to or less than 3 KHz, the resolution bandwidth must be reduced below 3 KHz until the individual lines in the spectrum are resolved. The measurement data must then be normalized to 3 KHz by summing the power of all the individual spectral lines within 3 KHz band (in linear power units) to determine compliance.
- If the spectrum line spacing cannot be resolved on the available spectrum analyzer, the noise density function on most modern conventional spectrum analyzer will directly measure the noise power density normalized to 1 Hz noise power bandwidth. Add 30 dB for correction to 3 KHz.
- Should all the above fail or any controversy develop regarding accuracy of measurement, the Laboratory will use HP 89440A Vector Signal Analyzer for final measurement unless a clear showing can be made for a further alternate.

8.7. PROCESSING GAIN OF A DIRECT SEQUENCE SPREAD SPECTRUM (DBPSK, DQPSK & CCK)

8.7.1.1. THEORETICAL PROCESS GAIN FOR DBPSK & DQPSK

The signal to noise ratio for an ideal differentially coherent detection of a differentially encoded BPSK receiver can be derived from the Bit Error Probability (Pb) versus Signal-to-Noise ratio. See attached plot for detailed information.

For measurement of the $(S/N)_o$ we use the Pb of $1.0x10^{-5}$ minimum.



Loss from P1 to P2 = 32.9

Ref.: Viterbi, A.J. Principles of Coherent Communications (New York: McGraw-HILL 1966), Pg. 207

Using equation (1) shown above, calculate the signal to noise ratio required for your chosen BER. This value and the measured J/S ratio are used in the following equation to calculate the Process Gain (Gp) of the system.

$$Gp = (S/N)o+Mj+Lsys$$

Where:

(S/N)o: Theoretical signal to noise ratio required to maintain the normal operation just before the BER appears. In real measurements the maximum error of 0.001 is allowed in an ideal system using their modulation scheme with all codes turned off (i.e. no spreading or processing gain).

Mj: Maximum jammer to Signal Ratio that recorded at the detected BER.

Lsys: System losses such as non-ideal synchronization, tracking circuitry, non-optimal baseband receiver filtering and etc... These losses can be in excess of 3 dB for each transmitter and receiver pair. For the purpose of this processing gain calculation we assume a Lsys at its minimum value of 2 dB.

Ref.: Dixon, R, Spread Spectrum Systems. (New York: Wiley, 1984), Chapter 1.

- (S/N)o: Refer to attached curves, BER versus (S/N)o for Differential Coherent Detection of Differentially Encoded BPSK
- Processing gain Gp = (S/N)o + Lsys + Mj = (S/N)o + 2 + Mj

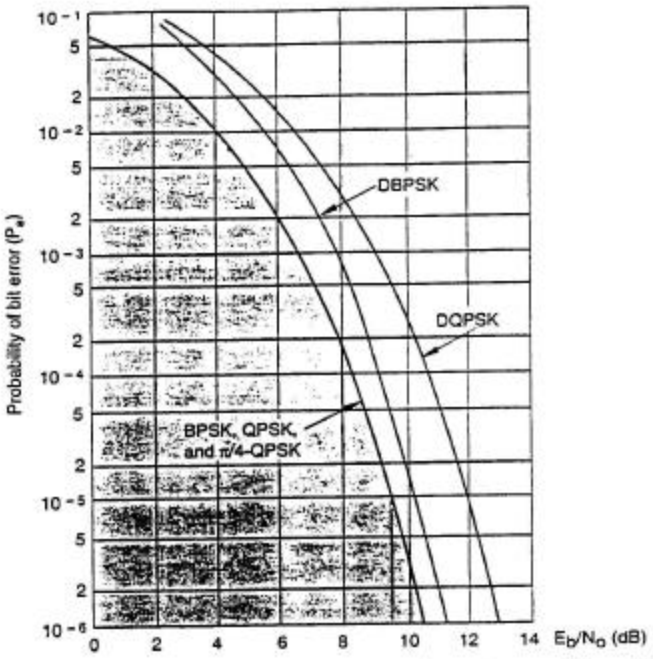


Figure 4.5.1 Theoretical $P_e = f(E_b/N_0)$ performance in a stationary additive white Gaussian noise (AWGN) environment. Ideal, linearly amplified coherent BPSK, QPSK, and differentially demodulated DBPSK systems are illustrated. The performance of non-linearly amplified FQPSK and GMSK is compared to ideal linearly amplified QPSK in Figures 4.3.33 and 4.3.34. (From Proakis, 1989.) See Appendix A.3.

tically equivalent term bit-error rate (BER) is used in applied references and specifications.

Power efficiency of modulated systems is defined as being inversely proportional to the

$$\text{BER} = f(C/N)$$

and/or

$$\text{BER} = f(E_b/N_o)$$

equations and performance curves, where E_b is the average energy of a modulated bit and N_o is the noise power spectral density (the noise power in a normalized 1-Hz bandwidth) at the demodulator input. The higher the probability of error, the lower the power efficiency, since transmitted power is "wasted" on more bad data.

8.7.1.2. THEORETICAL PROCESS GAIN FOR CCK MODULATION

In the case of CCK modulation at higher data rate, the Chip Rate/Symbol Rate (8 dB) is not an actual Process Gain since it is a combination of both Process gain and Coding Gain. The formula true formula for Procssing Gain calculation will be based on the CW Jamming Margin. Please refer to the attached theoretical Process Gain calculation written by Mr. Carl Andren at Harris Corporation for details.

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SCOPE:

This report presents the test procedure, test configuration and test data associated with a FCC Part 15.247 (e) Jamming Margin test for the indirect measurement of processing gain.

APPLICABLE REFERENCE DOCUMENTS:

1. "Operation within the bands 902-928 MHz, 2400-2483.5, and 5725-5850 MHz" ***Title 47 Part 15 section 247 (e) Code of Federal Regulations***. **(47 CFR 15.247).**
2. "Report and Order: Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters. Appendix C: 'Guidance on Measurements for Direct Sequence Spread Spectrum Systems" ***FCC 97-114. ET Docket No. 96-8, RM-8435, RM-8608, RM-8609.***
3. "HFA3861A Direct Sequence Spread Spectrum Baseband Processor" ***Harris Corporation Semiconductor Sector Preliminary Data Sheet***, Melbourne FL, July 1999.
4. " M-ary Orthogonal Keying BER Curve",

TEST BACKGROUND AND PROCEDURE.

According to FCC regulations [1], a direct sequence spread spectrum system must have a processing gain, G_p of at least 10 dB. Compliance to this requirement can be shown by demonstrating a relative bit-error-ratio (BER) performance improvement (and corresponding signal to noise ratio per symbol improvement of at least 10 dB) between the case where spread spectrum processes (coding, modulation) are engaged relative to the processes being bypassed. In some practical systems, the spread spectrum processing cannot simply be bypassed. In these cases, the processing gain can be indirectly measured by a jamming margin test [2]. In accordance with the new NPRM 99-231, if the vendor has a system with less than 10 chips per symbol, the CW jamming results must be supported by a theoretical explanation of the system processing gain.

THEORETICAL CALCULATIONS

The processing gain is related to the jamming margin as follows [2]:

$$G_p = \left(\frac{S}{N}\right)_{output} + \left(\frac{J}{S}\right) + L_{system}$$

Where $BER_{REFERENCE}$ is the reference bit error ratio with its corresponding, theoretical output signal to noise ratio per symbol, $(S/N)_{output}$, (J/S) is the jamming margin (jamming signal power relative to desired signal power), and L_{system} are the system implementation losses.

The maximum allowed total system implementation loss is 2 dB.

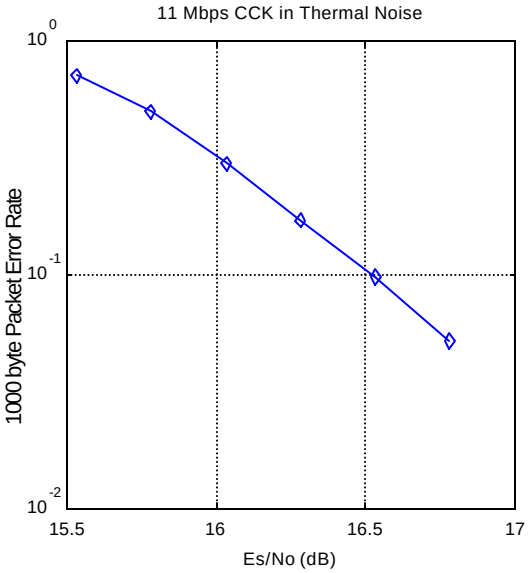
The HFA3861A direct sequence spread spectrum baseband processor uses CCK modulation which is a form of M-ary Orthogonal Keying. The BER performance curve is given by [5]:

" The probability of error for generalized M-ary Orthogonal signaling using coherent demodulation is given by:

$$P_e = 1 - P_{c1} = 1 - \frac{1}{\sqrt{2\pi}} \int_{-\frac{S_{01}}{N_0}}^{\infty} \left[2\left(1 - Q\left\{ z + \sqrt{2\frac{E_b}{\eta}} \right\}\right) \right]^{\frac{M}{2}-1} \exp\left\{ -\frac{z^2}{2} \right\} dz$$

This integral cannot be solved in closed form, and numerical integration must be used. There are error rate extensions for differential decoding and descrambling that are also to be accounted for. This is done in a MATHCAD environment and is displayed in graphical format below.

1000 BYTE PER VS. ES/NO



The reference PER is specified as 8%. The corresponding Es/No (signal to noise ratio per symbol) is 16.4 dB. The Es/No required to achieve the desired BER with maximum system implementation losses is 18.4 dB. The minimum processing gain is again, 10 dB, therefore:

$$G_p = \left(\frac{E_s}{N_o}\right)_{output} + \left(\frac{J}{S}\right) + L_{system} = 16.4dB + 2.0dB + \left(\frac{J}{S}\right) \geq 10dB$$

$$G_p = 18.4dB + \left(\frac{J}{S}\right) \geq 10dB$$

The minimum jammer to signal ratio is as follows:

$$\left(\frac{J}{S}\right) \geq -8.4dB$$

For the case of the HFA3861A, the bit rates are 1, 2, 5.5, and 11 Mbps. The corresponding symbol rates are 1, 1, 1.375, and 1.375 MSps. The chip rate is always 11 MCps, so the ratio of chip rate to symbol rate is 11:1 for the 1 and 2 Mbps rates and 8:1 for the 5.5 and 11 Mbps rates. Since the symbol rate to bit rate is less than 10 for the higher rates, we supply the theoretical processing gain calculation for these cases where spread spectrum processing gain with embedded

coding gain is utilized. This is reasonable in that they cannot be separated in the demodulation process. If a separable FEC coding scheme were used, we would not be comfortable making this assertion.

As can be seen from the curve of figure 1, the Es/N0 is 16.4 dB at the PER of 8%. This PER can be related to a BER of 1e-5 on 1000 byte packets. With 8 bits per symbol, the Eb/N0 is then 7.4 dB or 9 dB less than the Es/N0. It is well known that the Eb/N0 of BPSK is 9.6 dB for 1e-5 BER, so therefore the coding gain of CCK over BPSK is 2.2 dB. We add this to the processing gain of 9 dB to get 11.2 dB overall processing gain for the CW jammer test.

Taking the calculations above, if the $\left(\frac{J}{S}\right) \geq -8.4 dB$ then the equipment passes the CW jamming test.

8.7.1.3. Test Procedures

Obtain the simplex link shown. Perform all independent instrumentation calibrations prior to this procedure. Set operating power levels using fixed and variable attenuators in system to meet the following objectives:

1. Signal Power at receiver approximately -60 dBm (above thermal sensitivity such that thermal noise does not cause bit errors).

2. Signal Power at power meter between -20 and -30 dBm for optimal linearity.

3. Use spectrum analyzer to monitor test.

4. Ensure that CW Jammer generator RF output is disabled and measure the power at the power meter port using the power meter. This is the relative signal power, S_r.

5. Disable Transmitter, and set CW Jammer generator RF output frequency equal to the carrier frequency and enable generator output. Set reference CW Jammer power level at power meter port 8.4 dB below S_r (minimum J/S, or 10 dB processing gain reference level). Note the power level setting on the generator, this is the reference CW Jammer power setting, J_r.

6. Disable CW Jammer, re-establish link. PER test should be operating essentially error-free.

7. Enable CW Jammer at the reference power level and verify that the PER test indicates a PER of less than 8%.

8. Alternatively, adjust the CW Jammer level to that which causes 8% PER and verify that the S/J is less than 8.4 dB.

9. Repeat step 7 for uniform steps in frequency increments of 50 kHz across the receiver passband with the CW Jammer. In this case the receiver passband is $\pm$8.5 MHz.

The number of points where the PER fails to achieve 8% (is higher than 8%) is determined and if this is above 20% of the total, the test is failed otherwise it is passed.

The margin by which the radio passes the test (for informational purposes) can be determined from the average of the remaining points' PERs scaled on the PER curve above.

The numerical data associated with the following radio channels is tabulated and presented for Channel 6: 2437 MHz (middle channel of the band)

Basic Test Block Diagram