PRISM® 2.4GHz Chip Set



August 1997 File Number 4063.6

Direct Sequence Spread Spectrum Wireless Transceiver Chip Set



The Intersil 2.4GHz PRISM® chip set is a highly integrated six-chip solution for RF modems employing Direct Sequence Spread Spectrum (DSSS)

Data Sheet

signaling. Significant integration of transmit and receive functions employ the following ICs: complete integrated DSSS engine, the HFA3824; a quadrature modulator/ demodulator, integrated with an IF limiter amplifier with RSSI, the HFA3724, HFA3726; a combined LNA/Mixer and

upconverter/preamplifier, the HFA3624; a high performance, low noise amplifier for increased receiver sensitivity, the HFA3424; a dual synthesizer, the HFA3524 and a monolithic RF power amplifier, the HFA3925. Each of the functions may be used individually or in any combination in support of a variety of RF modem applications.

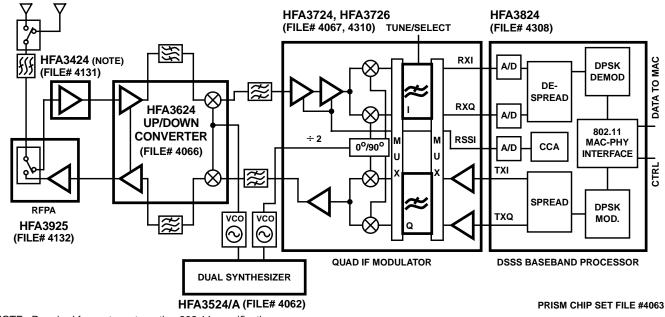
The PRISM chip set is intended to support various data rates including systems targeting the proposed IEEE 802.11 standard "Direct Sequence Physical layer (DS-PHY)". Differential BPSK and QPSK signaling is employed with differential encoding and decoding of packetized data. A PN sequence rate of up to 22MCPS is supported for up to a 16 chip PN code. Integrated programmable low pass filters are used on the HFA3724 to allow chip rates from 2.75MCPS to 22MCPS. A flexible general purpose data and control interface is provided for parameter configuration and for transferring data packets between the PHY and Media Access Control (MAC) layers. Data rates of up to 2MBPS for DBPSK and 4MBPS for DQPSK are supported.

Features

- Provides Antenna-to-Bits™ Data Stream
- Low Voltage Operation from 2.7V to 5.5V
- 2.4GHz 2.5GHz ISM Band Operation
- Single Heterodyne Conversion
- · Programmable Antialiasing and Shaping Filters
- 10MHz to 400MHz IF Operation with RSSI
- Autonomous Half Duplex Direct Sequence Modem
- Selectable DBPSK, DQPSK Signalling
- Antenna Diversity Selection
- Direct Sequence Physical Layer (DS-PHY)
- Differential Data Encoding/Decoding
- Programmable 16-Bit PN Code
- Data Rates up to 4MBPS DQPSK
- Power Management Control
- Low Profile PCMCIA-Compatible Surface Mount
 Packaging

Applications

- Systems Targeting IEEE 802.11 Standard
- PCMCIA Wireless Transceiver
- WLAN RF Modems
- TDMA Packet Protocol Radios
- Part 15 Compliant Radio Links



Typical Application Diagram

NOTE: Required for systems targeting 802.11 specifications.

1

Antenna to Bits[™] is a trademark of Intersil Corporation

CAUTION: These devices are sensitive to electrostatic discharge; follow proper IC Handling Procedures. 1-888-INTERSIL or 321-724-7143 | Intersil and Design is a trademark of Intersil Corporation. | Copyright © Intersil Corporation. 2000 PRISM is a registered trademark of Intersil Corporation. PRISM and design is a trademark of Intersil Corporation.

Typical 802.11 DS-PHY System Level Performance (Note 5) (Measured at a diversity antenna port)

Receiver

• Frequency Range 2.4GHz - 2.4835GHz
• Step Size1MHz
Cascaded Noise Figure6.8dB
• Sensitivity93dBm, 1MBPS, 8E-2 FER (Note 1) -90dBm, 2MBPS, 8E-2 FER (Note 1)
Input Intercept Point17dBm
• IF Frequency
• IF Bandwidth17MHz
Image Rejection 80dB
Adjacent Channel Rejection
• Supply Voltage
Transmitter
• Frequency Range2.4GHz - 2.4835GHz
• Step Size1MHz
• Output Power+18dBm
• Spurious Outputs Targeting ISM/802.11
Transmit Spectral Mask32dBr at First Side-Lobe
• IF Frequency

General Specifications

Processor

 Targeted Standard
Range
 RX/TX Switching Speed
 Mode 1: 190mA at 1µs Recovery (Notes 3, 4) Mode 2: 70mA at 25µs Recovery (Notes 3, 4)
- Mode 3: 60mA at 2ms Recovery (Notes 3, 4)
 Mode 4: 30mA at 5ms Recovery (Notes 3, 4) Average Current
(Without Power Savings Modes) 298mA (Note 6)
Average Current (With Power Savings Modes) 60mA (Note 7)
NOTES:
1. FER = Frame Error Rate or Packet Error Rate.
2. Range Test using AND-C-107 omnidirectional antenna.
3. Supply current includes AM79C930 MAC Processor.
4. Recovery time is for the PRISM 2.4GHz Chip Set only and does not include programming latency of the AM79C930 MAC

- 5. Refer to Application Note AN9624 for more information on the "PRISM DSSS PC Card Wireless LAN Description".
- 6. Based on average current consumption for "typical" application.
- 7. Power savings modes refer to AN9665. Average radio current consumption for "typical" application.

All Intersil products are manufactured, assembled and tested utilizing ISO9000 quality systems.

Intersil Corporation's quality certifications can be viewed at website www.intersil.com/quality/iso.asp.

Intersil products are sold by description only. Intersil Corporation reserves the right to make changes in circuit design and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.

For information regarding Intersil Corporation and its products, see web site www.intersil.com

Sales Office Headquarters

NORTH AMERICA

Intersil Corporation P. O. Box 883, Mail Stop 53-204 Melbourne, FL 32902 TEL: (321) 724-7000 FAX: (321) 724-7240

EUROPE

Intersil SA Mercure Center 100, Rue de la Fusee 1130 Brussels, Belgium TEL: (32) 2.724.2111 FAX: (32) 2.724.22.05

ASIA

Intersil Ltd. 8F-2, 96, Sec. 1, Chien-kuo North, Taipei, Taiwan 104 Republic of China TEL: 886-2-2515-8508 FAX: 886-2-2515-8369

2