

XPLC23

24Mbps Broadband PLC Chip for Data Communications



Introduction

The XPLC23 PLC chip is a small size, low power, high speed DMT based transceiver for PLC fully optimized to support various application interfaces including Ethernet, USB, PWM, and UART.

The XPLC23 chip supports payload data rates of up to 24Mbps and is fully compatible with the XPLC21 chip. Multiple interfaces are supported so that the XPLC23 chip or module can be embedded in a diverse range of equipments that require networking. The XPLC23 chip offers enhanced reliability and the best possible communication quality in always changing powerline conditions.

EMS (Element Management System) based on SNMP is supported for fully remote management and monitoring of the PLC devices. Features include automatic registration, revocation, performance monitoring, remote control, and firmware upgrade to enable easy setup and maintenance of PLC network devices based on Xeline's technology.

Features

- Payload data rate: Up to 24Mbps
- Used frequency bands: 2 ~ 23MHz
- Programmable power management
- Low power, small size PLC chip & module
- Embedded DAC and ADC
- 128Kbyte Instruction/Data memory
- Support of multiple application interfaces
- Intelligent Repeating for Smart Access
- Fully supported network management
- Easy setup and maintenance

Applications

- Broadband Internet access systems
- Home Networking (PC-to-PC, printer sharing, etc.)
- VoPL (Voice over Powerline)
- Security & surveillance (CCTV, IP cameras, etc.)
- Home / factory / building automation
- Office, school, hospital, vessel networking
- Can be embedded in all kinds of networking equipment

Chip Specifications

Technology	0.13 μ m CMOS
Supply voltage	1.2V core, 3.3V I/O
Processor	32bit RISC core
Memory	128Kbyte static RAM
Package	100-pin TQFP

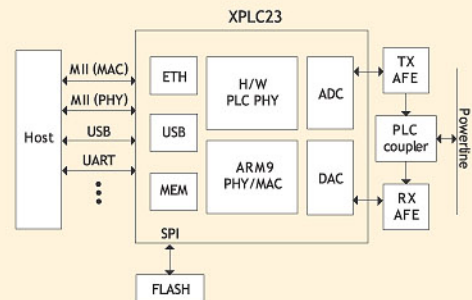
MAC Layer

MAC scheme	CMAC for Smart Access
Topology	Master / Slave and Ad-hoc
No. of Slaves	128 Slaves per Master
Master co-existence	Unlimited
NMS	Supported based on SNMP

Supported Interface

- Ethernet MAC or PHY
- USB 1.1
- 2 channel PWM
- 2 channel battery operated Pulse Counter (PC)
- UART with flow control
- Flexible SPI
- Up to 32 port GPIO

Architecture



PHY Layer

Used band	2 ~ 23MHz
Modulation	PSK based DMT 256 subchannels Up to 3 bit adaptive bit loading
Duplex	Half duplexing
Payload rate	Up to 24Mbps
UDP/TCP rate	Up to 14Mbps / Up to 8Mbps
Error correction	Convolutional & R/S codes with Interleaver
Transmit shape	Programmable notch filter Power allocation per each subchannel
Encryption	56bit DES

XMDL-2300

24Mbps PLC Module for Data Communications



Introduction

The XMDL-2300 PLC Module supports payload data rates of up to 24Mbps and is based on Xeline's proprietary XPLC23 PLC chip. The XMDL-2300 PLC Module is small size with low power consumption, and supports MII and UART interfaces, enabling the module to be easily integrated in all kinds of network equipments.

Features

- Dimensions: 38 x 38mm
- Based on XPLC23 PLC chip
- Payload data rate: Up to 24Mbps
- Used frequency bands: 2 ~ 23MHz
- Programmable power management
- Low power, small size PLC module
- Embedded DAC and ADC
- 128Kbyte Instruction/Data memory
- MII, UART interface supported
- Dynamic Intelligent Routing for Smart Access
- Fully supported network management
- Easy setup and maintenance

Applications

Embedded systems including:

- PLC router, hub, networking devices
- Street lamp control systems
- VoPL (Voice over Powerline)
- Security & surveillance (CCTV, IP cameras)
- Home / factory / building automation
- Office, school, hospital, vessel networking, etc.



< XMDL-2300 Front & Back View >



< XEVT23 PLC Modem >

Supported Interface

- PHY/MAC mode MII
- UART

Physical Layer (PHY) Features

Used Frequency	2~23MHz (programmable)
Modulation	Packet based Discrete Multi Tone (DMT) 256 subchannels
Error Correction	Convolutional code + R/S with Interleaver
Symbol Period	12.48 μsec
Data Rate	Up to 24Mbps (payload data rate) Up to 8Mbps for TCP applications Up to 14Mbps for UDP applications

Medium Access Control (MAC) Features

- Cell Structured MAC (CMAC) for coverage optimization
- Field-upgradable firmware
- Reliable communication by ARQ, segmentation, contention-free access, fast collision recovery, Virtual Carrier Sense (VCS), etc.
- Supports Network Management System based on SNMP

XEVT23 PLC Modem

The XEVT23 PLC Modem is based on the XMDL-2300 Module and provides an ideal and convenient way to test the performance of the XMDL-2300 Module.

Components	XMDL-2300 Module + Main Board
Interface	1 RJ-45 LAN port 1 AC powerline (default) 1 RJ-11 port for PLC signal coupling (optional) 1 RJ-11 port for RS-232 or RS-485 connection
Power Supply	90 ~ 240V (50Hz / 60Hz)
Dimensions	150 x 97 x 33mm

XEVT23 PLC Reference Design Kit

The XEVT23 Reference Design Kit consists of:

- XEVT23 PLC Modem 2 EA.
- CAT 5 UTP cable 2 EA.
- Serial Cable 2 EA.
- Power Cable 2 EA.
- Technical Documentation CD 1 EA.
- (1) XEVT23 PLC Modem User Guide
- (2) XelView Software and User Guide
- (3) XEVT23 Main Board Hardware Specifications
- (4) XMDL-2300 Module Hardware Specifications
- (5) XPLC23 PLC Chip Datasheet