# CONEXANT™

HomePlug 1.0 PHY Device
CX11647

The Conexant CX11647 device is an integrated physical layer transceiver (PHY) designed to use existing AC electrical wiring within the home as the networking medium with rates of up to 14 Mbps. The PHY's robust performance in this electrically noisy medium is made possible by the use of Orthogonal Frequency Division Multiplexing (OFDM), a multi-carrier modulation scheme that allows the PHY to "learn" the channel in real time. Thus, data can be shifted from one carrier to another as real time noise and attenuation conditions change.

The ODFM feature overcomes the flaw inherent in previous single carrier (Powerline) networking technologies. As electrical appliances are turned on and off, line conditions change and cause signal quality to become degraded to the point where data transmission is no longer feasible. With ODFM, the CX11647 finds the low noise, low attenuation portions of the spectrum available to it and continues data transmission.
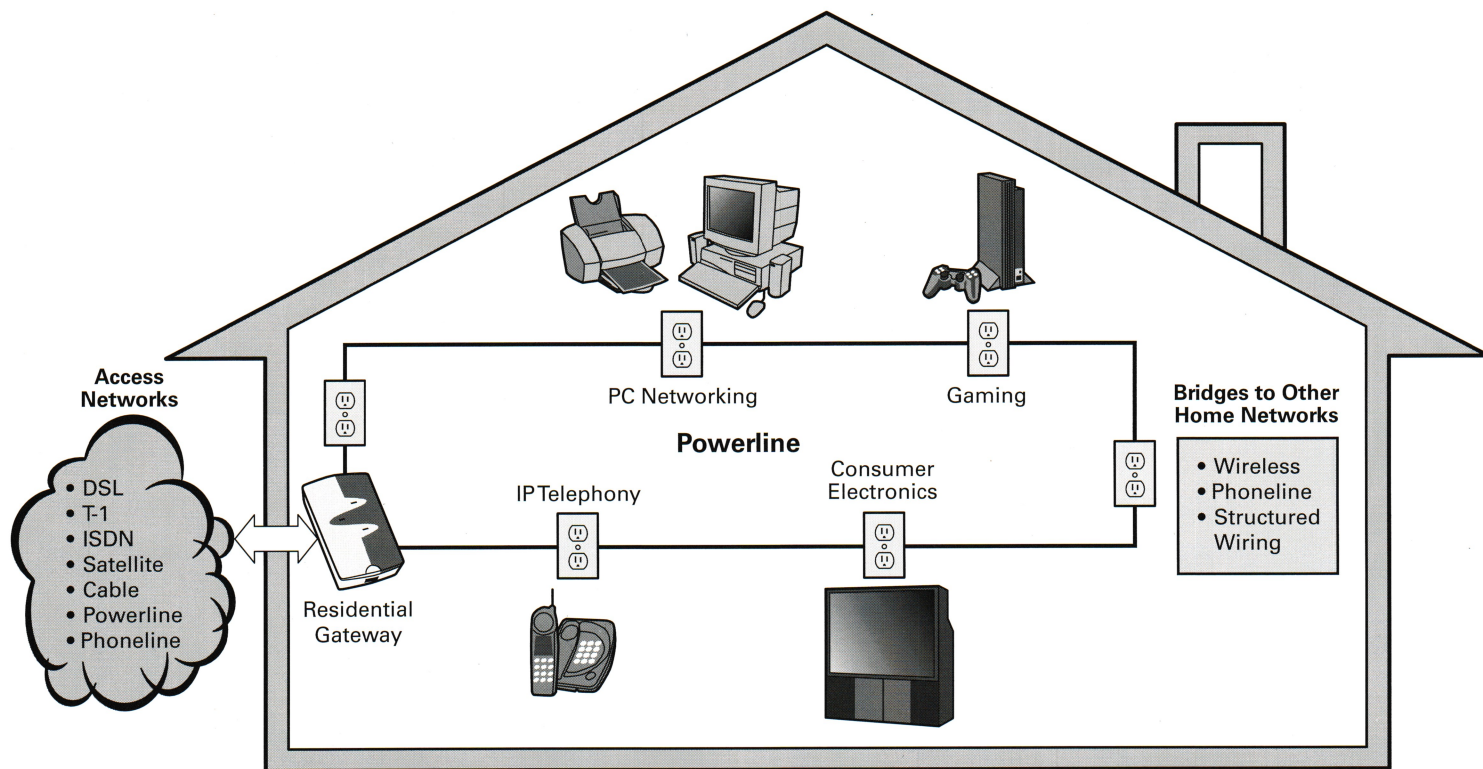
The CX11647 has been optimized for low-latency, high-reliability networking in applications like residential gateways and routers, multi-player gaming and entertainment, shared broadband access, streaming audio/video and Internet Protocol (IP) telephony. It fully supports the industry standard HomePlug 1.0 specification.

The PHY utilizes the IEEE 802.3u standard Media Independent Interface (MII). This standard interface can also be configured as a seven-wire General Purpose Serial Interface (GPSI). This allows the CX11647 to be paired with almost any 802.3 compliant embedded Media Access Controller (MAC) for use in a variety of information appliances.
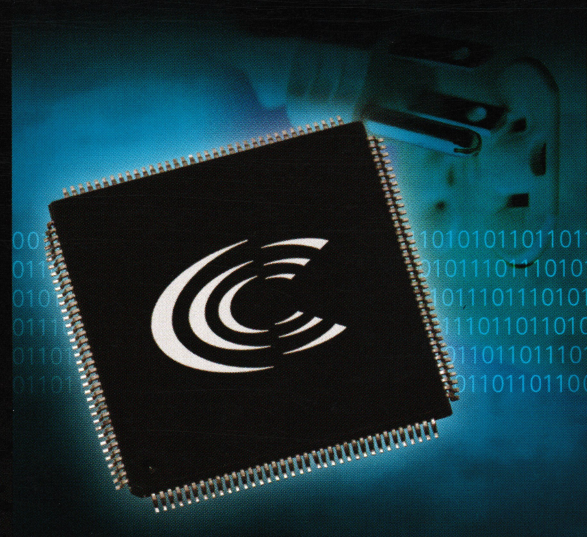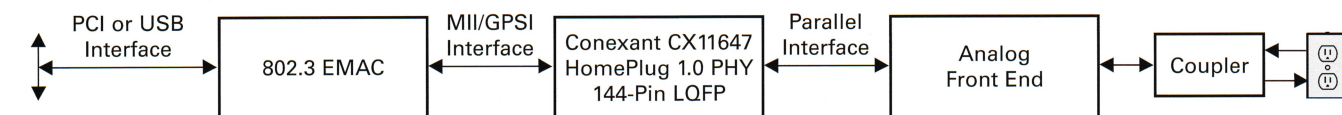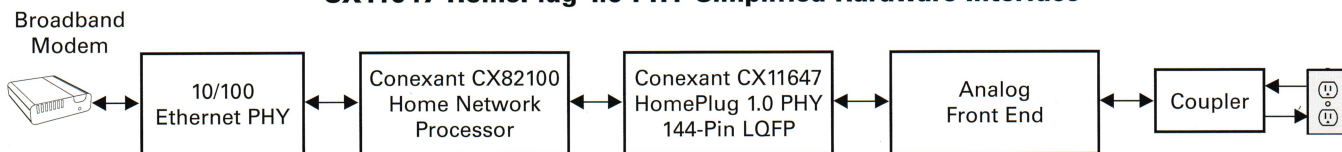

Distinguishing Features

- Single-chip powerline networking controller with IEEE 802.3u MII interface
- Orthogonal Frequency Division Multiplexing (OFDM) for high data reliability in noisy media conditions
- Selectable MDI (Management Data Interface)/SPI (Serial Peripheral Interface) PHY management interface
- Up to 14 Mbps data rate on the powerline
- 3.3V signaling, 5V tolerant interface
- 144-pin LQFP package

HomePlug's Connected Home

Access Networks
- DSL
- T-1
- ISDN
- Satellite
- Cable
- Powerline
- Phoneline

Residential Gateway

Powerline

PC Networking

Gaming

IP Telephony

Consumer Electronics

Bridges to Other Home Networks
- Wireless
- Phoneline
- Structured Wiring

CX11647 HomePlug 1.0 PHY Simplified Hardware Interface

PCI or USB Interface → 802.3 EMAC → MII/GPSI Interface → Conexant CX11647 HomePlug 1.0 PHY 144-Pin LQFP → Parallel Interface → Analog Front End → Coupler

Conexant HomePlug PHY used in a Home Router

Broadband Modem → 10/100 Ethernet PHY → Conexant CX82100 Home Network Processor → Conexant CX11647 HomePlug 1.0 PHY 144-Pin LQFP → Analog Front End → Coupler

Product Features

- Implements the HomePlug Powerline Alliance Industry Specification V1.0
- Intelligent channel adaptation maximizes throughput under harsh channel conditions
- Integrated Quality-of-Service (QoS) features such as prioritized random access, contention-free access, and segment bursting

- 56-bit DES Link Encryption with key management for secure powerline communications
- EEPROM interface for fast access to configuration parameters allows system designs to leverage standard Ethernet drivers
- IEEE 1149.1 JTAG Test Access Port
- Management control provided via the Management Data Interface (MDI) or the Serial Peripheral Interface (SPI)

- Analog Front End Interface
- LEDs indicating network status

Applications

- Network home or small office PCs
- Enable no wire installation networking for information appliances
- Residential gateways and home routers
- LAN gaming

- Share DSL or cable modem access
- MDU/MTU applications
- Embedded applications
- Bridges to other wires or wireless networks

CONEXANT™
What's next in communications technologies