Overview

The JL4201 is a highly integrated Ethernet PHY transceiver that is compatible with 10BASE-Te, 100BASE-TX, 1000BASE-T, and 2.5GBASE-T, and is fully compatible with both the IEEE 802.3 standard and the NBASE-T™ Alliance PHY. It provides all the necessary physical layer functions to transmit and receive Ethernet packets over Category 5e UTP cable. The JL4201 also performs PHY functions such as crossover detection and auto-correction, polarity correction, downshift, MDI swap and loopback diagnostic capability.
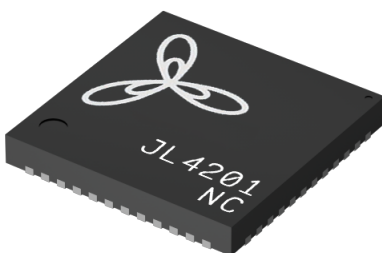
The JL4201 supports SGMII, H-SGMII, and 2500BASE-X to transfer data between MAC and PHY via the SerDes (Serializer-Deserializer) interface to reduce the number of IOs.

Built on advanced mixed-signal technology and process node, the JL4201 is able to perform equalization, echo and crosstalk cancellation, data recovery, and error correction functions. The JL4201 device also supports Synchronous Ethernet (SyncE) function for synchronization application. Additionally, the JL4201 features an integrated Virtual Cable Tester, which can detect short, open, and cable lengths.

The JL4201 can operate at various digital I/O voltages, including 3.3V and 1.8V.

Typical Applications

- Enterprise and SOHO Ethernet Switch
- Wireless Router, DSLAMs, PON Equipment
- Industrial controls and Automation Equipment

Features

- Single chip Ethernet transceiver Compatible with IEEE 802.3u, IEEE 802.3ab and IEEE 802.3bz
- Integrated 10BASE-Te, 100BASE-TX, 1000BASE-T and 2.5GBASE-T IEEE 802.3 compatible transceiver
- Compatible with NBASE-T™ Alliance PHY Specification
- Supports Parallel Detection
- Baseline Wander Correction
- Supports IEEE 802.3az (Energy Efficient Ethernet)
- Supports Full Duplex flow control (IEEE 802.3x)
- Supports IEEE 802.3 optional Fast retrain
- Auto-Negotiation with Extended Next Page capability (XNP)
- Supports pair swap/polarity/skew correction
- Crossover Detection & Auto-Correction
- Configurable MDI port ordering (MDI swap) for easy PCB layout
- Supports power-down/link-down power saving mode
- SerDes interface supports SGMII, H-SGMII and 2500BASE-X
- Built-in Wake-on-LAN (WOL) over UTP
- Supports Interrupt function
- Cable diagnostics function
- Supports Clause 22 and Clause 45 MDC/MDIO management interface
- Selectable 3.3V/1.8V signaling for MMD access
- Supports 25-MHz crystal or external OSC
- Provides 25-MHz clock out source for MAC
- Provides 3 network customized LEDs
- Self-Loopback diagnostic capability
- Thermal management on PHY
- Supports Synchronous Ethernet
- Supports SPI Flash
- Supports up to 16K Bytes Jumbo Frame
- 48-pin QFN package