

μPD60621

Extended Dual Channel 10/100 Ethernet PHY

The dual channel 10/100 Ethernet PHY is a fully integrated physical layer device to connect to standard IEEE802.3 Ethernet networks. In applications such as industrial networking, ring structured networks become standard to enable redundancy and improve reliability. For such applications two channel PHYs are required in each node. Apart from supporting this type of applications with its enhanced link down detection mechanisms this Dual Channel PHY specifically focuses on low latency and low jitter to support today's industrial Ethernet standards. Renesas' specific enhanced diagnosis features allow a permanent cable quality monitoring for easy maintenance in factory automation by early failure recognition and prediction. In addition it features hardware support for PTP as defined in IEEE1588 v2 including time controlled generation and recognition of events on I/O pins.

The PHY can connect to twisted-pair cable via external magnetics or to optical fibre via fibre PMD modules. It interfaces to an Ethernet MAC through the IEEE 802.3 Standard Media Independent Interface (MII) or reduced MII interface.

Applications

- Industrial networking such as PROFINET, EtherNet/IP, Modbus TCP/IP, EtherCAT or others
- 10/100 Mbps LAN on motherboard (LOM) and network interface card (NIC)
- Switches, routers and repeaters with 10/100 Mbps capable ports
- Mobile basestations
- Test and measurement applications
- Home servers, broadband routers, printers, game equipment and IP phones
- Telecom base stations
- Real-time networking
- Audio/video transmission

Product features

- Two channel PHY
- Fully standard compliant with IEEE 802.3/802.3u for 100BASE-TX, 100BASE-FX and 10BASE-T
- MDI interface:
 - » 10BASE-T and 100BASE-TX to UTP cable via magnetics
 - » 100BASE-FX to fiber via optical module
- Integrated PMD sub-layer featuring adaptive equalization and baseline wander correction
- IEEE 802.3u auto-negotiation and parallel detection
- Full and half duplex operation
- Supports automatic polarity detection and correction
- Supports automatic MDI/MDI-X crossover
- Supports IEEE1588 v1 and v2

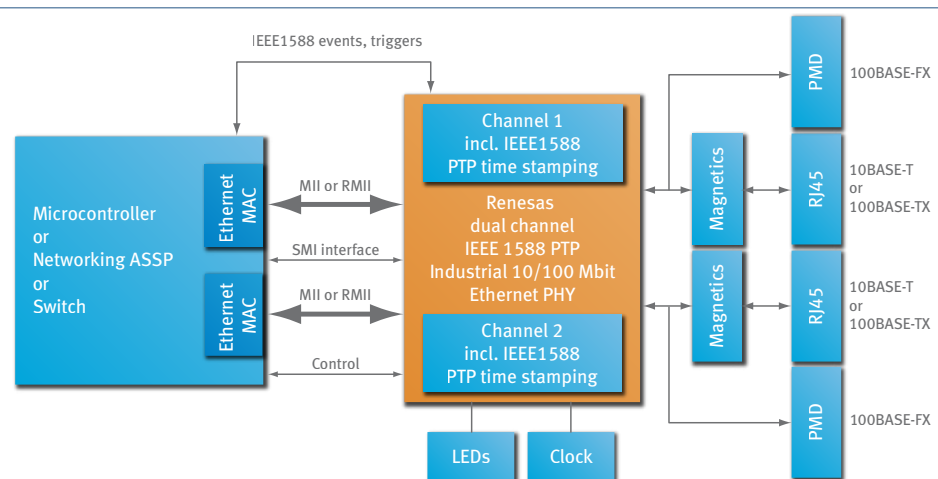
Special features

- Low latency and low jitter for industrial networking
- Fast link-down detection
- Permanent cable quality tracking
- Enhanced system testability (such as bypass, loopback and cable length measurement by TDR)
- Fast link-up option
- Industrial networking special auto-negotiation function
- Fast error detection
- Cable monitoring and error detection
- 1 ns resolution timer for hardware support of IEEE1588
- Timestamping function to timestamp incoming and outgoing telegrams and pin activity
- Output pins controlled by internal clock

Upper layer interface

- Flexible MAC interface: MII and RMII
- Serial management port (MDC/MDIO)
- Supports user programmable interrupts
- Enables software power-up/down and automatic power-up/down by energy detection
- Single 3.3V power supply
- Operating temperature: $T_{\text{ambient}} = -40 \text{ to } +85 \text{ }^{\circ}\text{C}$
(T_{junction} from $-40 \text{ to } +125^{\circ}\text{C}$)

System Set-up



Development tools

A demonstration kit based on Renesas standard microcontroller is available soon.

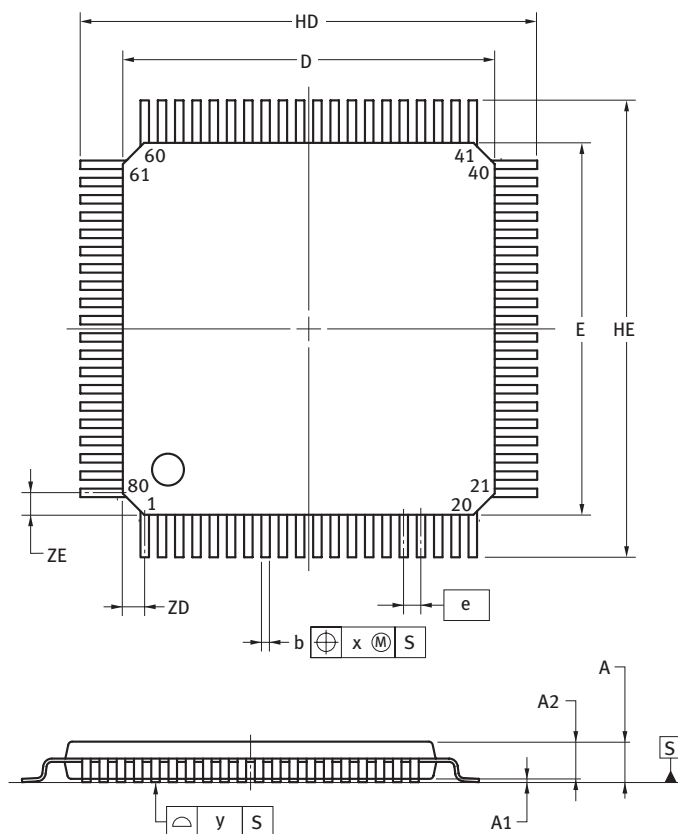
For samples please contact your Renesas office or distributor.

Software driver

A generic driver applicable for various operating systems is in preparation.

Package

- LQFP80 – 12 x 12 mm, 0.5 mm pitch



Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

