

Quad-Port 2.5G Ethernet PHYs for Routers, Switches, and Gateways

PRODUCTS

GPY241 4-port 2.5GbE PHY

GPY245 4-port 2.5GbE PHY with MACsec and SyncE

FEATURES

- Supports IEEE802.3 modes:
 - 2.5GBASE-T and 1000BASE-T: full-duplex
 - 100BASE-TX and 10BASE-T: full- and half-duplex
- Industrial temp. range (-40°C to 85°C) GPY245
- MAC interface: Four channel SGMII+/SGMII or single channel USXGMII-4x2.5G. Rate adaptation for SGMII+/SGMII and USXGMII using IEEE802.3x flow control
- Preamble alignment: Shortened 7 byte preamble received over SGMII+/SGMII is restored to 8 byte
- Two power rails for use with SGMII+ (3.3V and core) and three power rails for use with USXGMII (3.3V, 1.8V and core)
- BGA-260 package (12mm x 12mm)
- Typical power consumption of 1W per port in 2.5GBASE-T mode
- Precise time stamping support according to IEEE1588 Version 2
- Control of up to 12 LEDs with smart LED brightness control for link status display
- Smart-AZ feature supports Energy Efficient Ethernet (EEE, IEEE802.3az) with MACs that do not support EEE
- Field firmware upgrade capability with external optional flash
- Programmable temperature sensor monitors device temperature for system warning and down speed
- Supports Jumbo frames of up to 10kB
- Cable diagnostics
- Auto down speed for Cat3 (four wires) or bad cable
- Auto MDI/MDI-X and auto polarity correction
- Wake-on-LAN
- MACsec wire-speed data encryption and decryption with 16 security channels and 32 MACsec associations (GPY245)
- Synchronous Ethernet (SyncE) support according to ITU-T G.8262 (GPY245)

APPLICATIONS

- Broadband router: xPON, wireless, 4G/5G, G.Fast, G.hn, cable, xDSL
- Home gateway: wireless gateway, home server, home storage (NAS)
- High and low port count 2.5 GbE switch
- Wi-Fi 6 / Wi-Fi 7 routers and access points



Faster Ethernet connectivity enables users to make the most of increased speeds available through the enhanced broadband access networks. 2.5Gigabit Ethernet (GbE) increases the bandwidth without the need to change cables, is more cost-effective, and consumes less power than 5GbE or 10GbE.

The GPY241 and GPY245 are 4-port 2.5Gb Ethernet PHYs suited for routers, switches, and home gateways.

The devices support the 2.5GBASE-T, 1000BASE-T, 100BASE-TX and 10BASE-T modes of the IEEE802.3 standard and provide great interoperability for high data rate connections as well as for connections to legacy 1000BASE-T, 100BASE-TX and 10BASE-T devices.

The GPY241 and GPY245 connect to a switch or gateway MAC interface by either a single four pin 10G USXGMII-4x2.5G interface or four SGMII+ interfaces. SGMII+ is a Serial-GMII (SGMII) interface clocked with 3.125Gbaud/s to support a data rate of 2.5Gbit/s. Rate adaptation using IEEE 802.3x pause frames is supported for 10Mbit/s, 100Mbit/s, and 1Gbit/s transmission over the SGMII+ interfaces or the USXGMII interface.

STANDARDS:

- IEEE 802.3: Relevant clauses
- IEEE802.1AE MACSec
- IEEE 1588 Version 2
- ITU-T G.8261/G.8262: SyncE

GPY24x Ethernet Network Connection

For Industrial, transportation and mobile networking applications requiring time synchronization, the GPY241 and GPY245 support timestamp insertion and retrieval according to the IEEE 1588v2 standard.

The GPY245 is designed to work in the industrial temperature range and supports clock synchronization with SyncE (Synchronous Ethernet) and wire-speed MACsec data encryption.

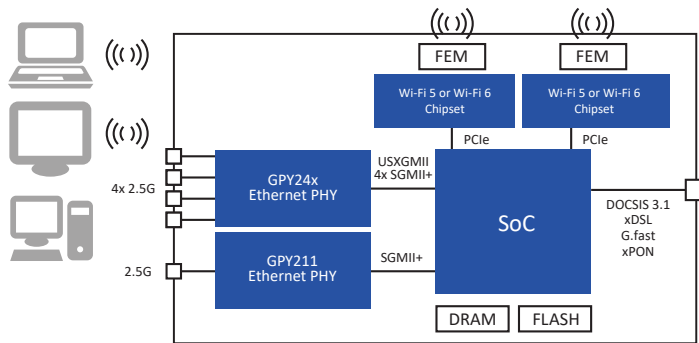
Low Power Consumption

The GPY241 and GPY245 have a typical power consumption of 1W per port in 2.5GBASE-T mode. For reduced power

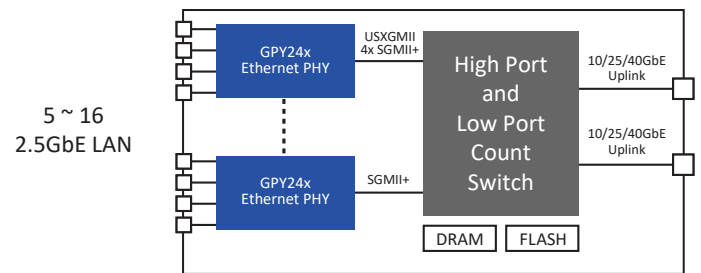
consumption during periods of low traffic, Energy Efficient Ethernet (EEE) is supported for 2.5GBASE-T, 1000BASE-T and 100BASE-TX. Additional power saving can be achieved by using the Wake-on-LAN (WoL) functionality.

Small Footprint and RBOM

The GPY241 and GPY245 are packaged in small 12 x 12mm FC-BGA-260 packages, ideal for 4-layer PCBs. A low EMI line driver with integrated termination simplifies the PCB design. Four SGMII+ interfaces or one USXGMII interface support 10/100/1000/2500Mbit/s speeds. The devices require two power supply rails when using SGMII+ as the MAC interface and three power supply rails when using USXGMII.



Router and Gateway Application



High Port and Low Port Count Switch Application

Product Information

Part Number	Description	Temperature Range	Ordering Code	Package
GPY241B0BC	4-port 2.5GbE PHY	Commercial 0°C to 70°C	999X65	BGA-260
GPY245B0BI	4-port 2.5GbE PHY with MACsec and SyncE	Industrial -40°C to 85°C	999X6K	BGA-260



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