2.5Gigabit Ethernet PHY for Routers, Switches, and Gateway

PRODUCTS

GPY211	Single-port 2.5GbE PHY
GPY212	Single-port 2.5GbE PHY that includes MACsec
GPY215	Single-port 2.5GbE PHY for industrial applications that includes MACsec and SynE
GPY115	Single-port 1GbE PHY for industrial applications that includes MACsec and SynE

FEATURES

- Full and half-duplex modes for 10BASE-T(e), 100BASE-T, 1000BASE-T, and 2.5GBASE-T
- Single power supply at 3.3V that uses the integrated DC/DC switching regulator
- Single-row VQFN-56 package (7 x 7mm)
- Low power consumption of typically 1.3W at 2.5GBASE-T
- Precise time stamping according to the *IEEE 1588 Version 2 and Synchronous Ethernet (SyncE)*
- Smart LED brightness control integrated for the link status display
- Smart AZ for legacy MAC to support *IEEE 802.az* power saving in idle mode
- Rate adaptation for fix MAC rate with different TP speed.
- Remote firmware upgradable through external optional flash.
- Programmable thermal sensor to monitor the device temperature for the system warning and the down speed
- Industrial temperature range is from -40°C to 85°C (GPY215 and GPY115)
- 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,16 security channels and 32 association numbers (GPY212 only)

MAIN APPLICATIONS

- Broadband router: xPON, wireless, 4G/5G, G.Fast, G.hn, cable, xDSL
- Home gateway: wireless gateway, home server, home storage (NAS)
- High port and low port count 2.5GbE switch
- Dual-band dual-concurrent *802.11ac/ax* enterprise access point

2.5Gigabit Ethernet PHY for Routers, Switches and Gateways

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 changing cables and it is more cost-effective and consumes less power than 5GbE or 10GbE.

The Ethernet network connection of the GPY21x device is a 2.5GbE PHY that is suited for routers, switches, and home gateways. It provides interoperability for NBaseT and the new *IEEE 802.3bz* standard. It is also optimized to work with 2.5GbE PHY for PCs.

The device temperature is monitored by an internal thermal sensor that provides thermal information for system warnings or initiates speed reduction to prevent system overheating. It supports a timing synchronization according to the *IEEE 1588v2 and SyncE* standard required for Industrial, transportation, and mobile networking.

The GPY212/GPY215/GPY115 device also supports MACsec point-to-point wire speed data security. The GPY21x is configurable through pin strapping, MDIO interface, or external flash.
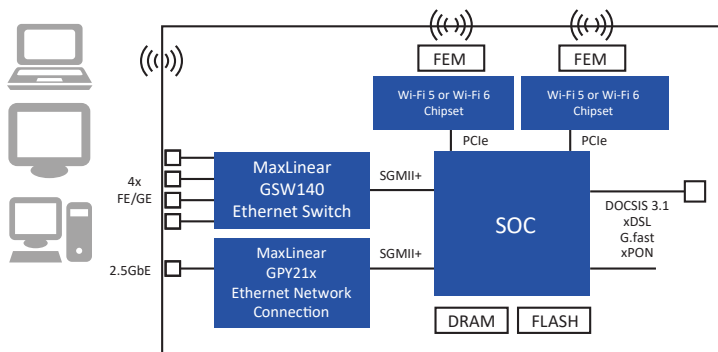
Standards:

- IEEE 802.3: Relevant clauses
- IEEE 802.3bz and NBASE-T
- IEEE 802.3az: Energy-Efficient Ethernet
- IEEE 1588 Version 2 and SyncE
- IEEE 802.1AE MACSec

The rate adaptation function is to help MAC which cannot support lower speed. The fix MAC rate between PHY and MAC and TP interface run at different speed.

Low Power Consumption

The GPY21x device has a low power consumption of 1.3W in 2.5GBASE-T mode. The device supports energy-efficient Ethernet to reduce power consumption depending on traffic. Additionally, the power can be saved at the system level by using the wake-on-LAN (WoL) functionality, the ultra-low power mode, and the *no link* states.
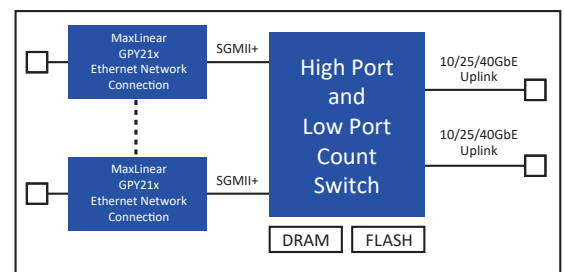
Small Footprint and RBOM

The GPY21x device is packaged in a small 7 x 7mm single-row VQFN-56, ideal for 2 or 4-layer PCBs. The low EMI line driver with integrated termination simplifies the PCB design. The SGMII interface supports 10/100/1000/2500Mbps speeds. The device can be operated from a single 3.3V power supply using the integrated DC/DC switching regulator.

Router and Gateway Application

High Port and Low Port Count Switch Application

Product Information

Product	Description	Ordering Code	Package
GPY211 Ethernet Network Connection	Single-port 2.5GbE PHY	GPY211B1VC	VQFN-56
GPY212 Ethernet Network Connection	Single-port 2.5GbE PHY including MACsec	GPY212B1VC	VQFN-56
GPY215 Ethernet Network Connection	Single-port 2.5GbE PHY for industrial applications including MACsec and SynE	GPY215B1VI	VQFN-56
GPY115 Ethernet Network Connection	Single-port 1GbE PHY for industrial applications including MACsec and SynE	GPY115B1VI	VQFN-56

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