MaxLinear

MxL86280, MxL86282

2.5G Ethernet Switches with 8 Integrated PHYs and 10G Uplinks

OVERVIEW

Products	Ports	Uplinks	Web-Smart	Temp Range
MxL86280C	8	0	No	Commercial
MxL86282C	10	2	No	Commercial
MxL86282S	10	2	Yes	Commercial
MxL86282I	10	2	Yes	Industrial

FEATURES

- Wire speed switching between all ports
- Two 10G XFI / USXGMII / SGMII uplink ports (MxL86282)
- VLAN, QoS, loop detection, ACL
- Eight integrated 2.5GBASE-T PHYs
  - 2.5GBASE-T, 1000BASE-T, 100BASE-TX and 10BASE-Te link rates
- Package PG-FCLBGA-277 12mm x 12mm, 0.628 / 0.700 mixed ball pitch
- Commercial and industrial temperature variants
- Variants for web-smart applications

BENEFITS

- Low power consumption through high integration
- Power saving modes for short cable, through Energy Efficient Ethernet (EEE) and no-link detection
- Same package for 8 and 10 port switches
- Integrated processor enables web-smart switch applications (MxL86282S, MxL86282I)

APPLICATIONS

- Standalone eight port 2.5G switches with or without uplinks
- Unmanaged and web-smart switches
- External switches for gateway SoCs
- Industrial switches

STANDARDS

- IEEE Standard for Ethernet, IEEE802.3™-2018

Product Description

MxL86280 and MxL86282 are highly integrated 2.5G Ethernet switches with eight integrated 2.5GBASE-T PHYs. The MxL86282 also supports two 10G / 2.5G / 1G uplink ports for connection of two SFPs, two external BASE-T PHYs or a gateway SoC. These switches have low power consumption due to their high integration and advanced technology.

2.5GBASE-T works over the same Cat5e link segments as 1000BASE-T. Networks can benefit from the higher rate without the need to change cable installations.

The integrated microcontroller in MxL86282S and MxL86282I can run a real-time operating system with a web server. This allows customers to design a web-smart switch, which can be configured over a web-browser on a PC or a mobile device.

To enable industrial and outdoor applications, the MxL86282I supports the industrial temperature range.

All parts are packaged in a small 12 mm x 12 mm 277 ball BGA package, which enables single layouts for switches with and without uplink.

The switches execute their program from an external cost effective QSPI Flash. The QSPI Flash code can be upgraded in the field.

System Features

- Clock input from a 25MHz or 50MHz oscillator or crystal
- Quad SPI interface for execution from external Flash
- Two master I^2C interfaces to control two SFPs (MxL86282)
- MDIO slave interface to control the device when connected to an external SoC
- Integrated temperature sensor for warning interrupt and auto down speed
- 4 power supply rails: 3.3V, 1.8V, 1.2V, and 0.8V
- Typical power consumption below 5W

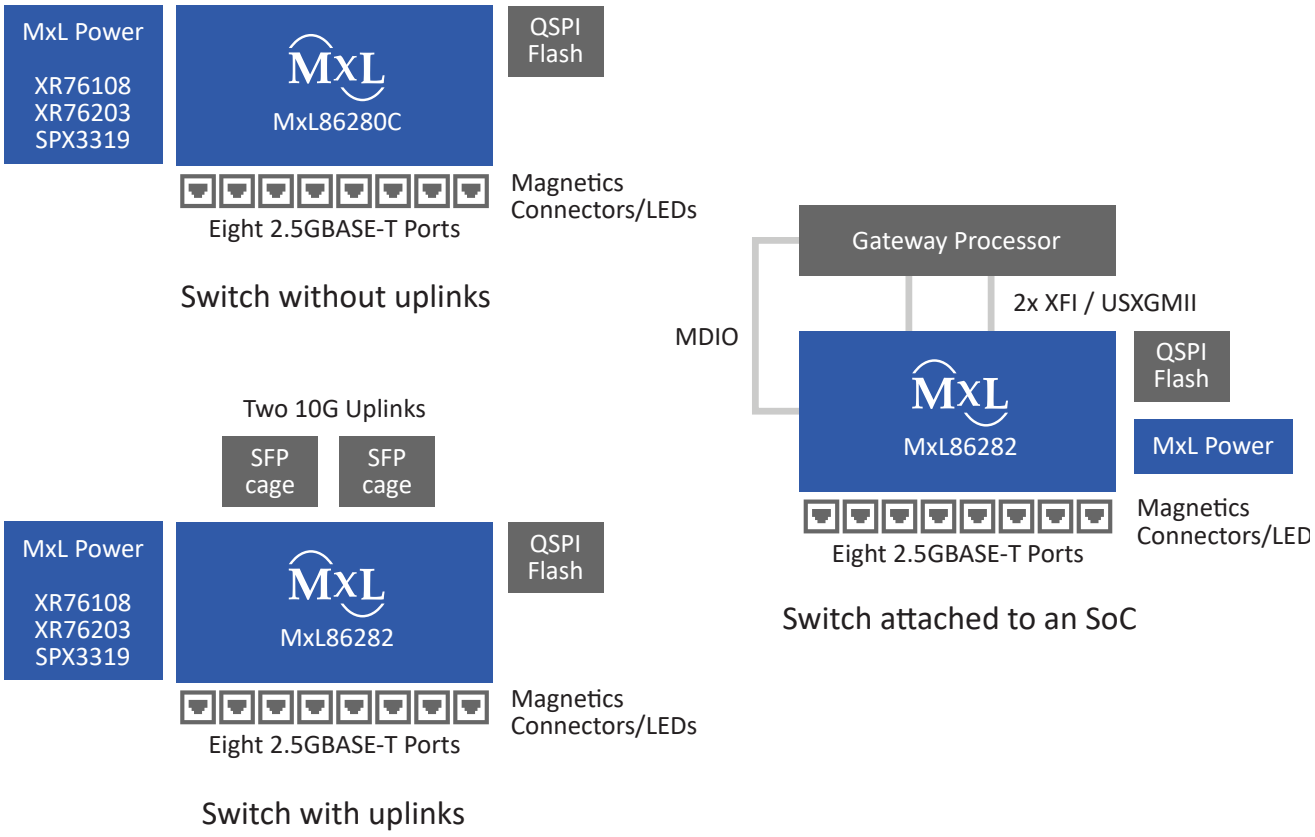
PHY Features

- 2.5GBASE-T and 1000BASE-T full duplex, 100BASE-TX and 10BASE-Te full and half-duplex
- More than 100m reach over CAT5e or higher quality link segments
- Low EMI voltage mode line driver with integrated termination resistors
- Auto-Negotiation (ANEG) with extended next page support
- Auto MDI/MDI-X and auto polarity detection and correction
- Auto down-speed (ADS) for poor cables
- Energy Efficient Ethernet for 100BASE-TX, 1000BASE-T and 2.5GBASE-T
- Additional power savings with no-link and short cable detection
- Wake-on-LAN (WoL)
- Fast retrain
- Three configurable network status LEDs per port
- Cable diagnostic: cable open/short detection and cable length estimation
- Support of jumbo frames up to 10kB
- Support of MACsec, PTP (Precision time Protocol IEEE1588v2), and SyncE in MxL86282I

Switch Features

- Wire speed switching between all ports
- 16k entry VLAN-aware MAC address table
- 4 to 8Mbit packet buffer depending on mode
- Layer 2 security: IEEE 802.1X port authentication, MAC address filtering, port locking and spoofing detection, MAC address limiting, and broadcast storm control
- Supports multiple spanning tree protocols
- MAC in MAC tunneling (802.1ah), 256 tunnels
- L3 multicast forwarding, IGMP (v2 and v3) / MLD (1 and 2) snooping
- VLAN support with 512 VLANs and 4k VIDs
- Supports QinQ double tagging
- Supports RMON groups 1, 2, 3 and 9
- Multiple to 1 port mirroring
- QoS with 128 priority queues: Weighted round robin, strict and mix up mode
- Link aggregation
- Loop detection
- 512 ACL (access control list) entries
- Per port or flow-based traffic shaping
- Up to 4Gbit external Flash for dual image storage
- Build-in CPU for web-smart switch applications in MxL86282S and MxL86282I
- Secure boot support

Application Block Diagram



Product Information

Part Number	Ordering Code	Ports	Uplinks	Web-smart Support	Temperature Range	Additional Features	Package
MxL86280C	MXL86280C-ABE-R	8	0	No	0°C to 70°C		PG-FCLBGA-277
MxL86282C	MXL86282C-ABE-R	10	2	No	0°C to 70°C		
MxL86282S	MXL86282S-ABE-R	10	2	Yes	0°C to 70°C		
MxL86282I	MXL86282I-ABE-R	10	2	Yes	-40°C to 85°C	MACsec, PTP, and SyncE support	

Evaluation Kit

Part Number	Description
MXL86282S-EVK-1	Evaluation Kit for MxL86280C, MxL86282C, MxL86282S, and MxL86282I (equipped with MxL86282S)

Corporate Headquarters:
5966 La Place Court
Suite 100
Carlsbad, CA 92008
Tel.:+1 (760) 692-0711
Fax: +1 (760) 444-8598
www.maxlinear.com