MAXLINEAR

MxL86252

2.5G Ethernet Switches with 5 Integrated PHYs and Uplinks

PRODUCTS

Products	Ports	Uplinks	Web-Smart	Temp Range
MxL86252C	7	2	No	Commercial
MxL86252L	7	2	No	Commercial
MxL86252S	7	2	Yes	Commercial
MxL86252I	7	2	Yes	Industrial

FEATURES

- Wire-speed switching between all ports
- Two 10G XFI / USXGMII / SGMII uplink ports
- VLAN, QoS, loop detection, ACL
- Five 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 cables, through Energy Efficient Ethernet (EEE) and no-link detection
- Same package for 5 and 7 port switches
- Integrated processor enables web-smart switch applications (MxL86252S, MxL86252I)

APPLICATIONS

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

STANDARDS

- IEEE Standard for Ethernet, IEEE802.3™-2022

Product Description

MxL86252C, MxL86252L, MxL86252I, MxL86252S are highly integrated 2.5G Ethernet switches with five integrated 2.5GBASE-T PHYs.

MxL86252 supports two uplink SERDES ports. The ports can be configured to support 10G XFI, USXGMII, 2.5G SGMII, or 1G SGMII. The uplink ports are used 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 MxL86252S and MxL86252I 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, MxL86252I supports the industrial temperature range.

The parts are packaged in a small 12 mm x 12 mm 277 ball BGA package, which allows a single layout to be used for switches with and without uplinks.

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
- 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 4W

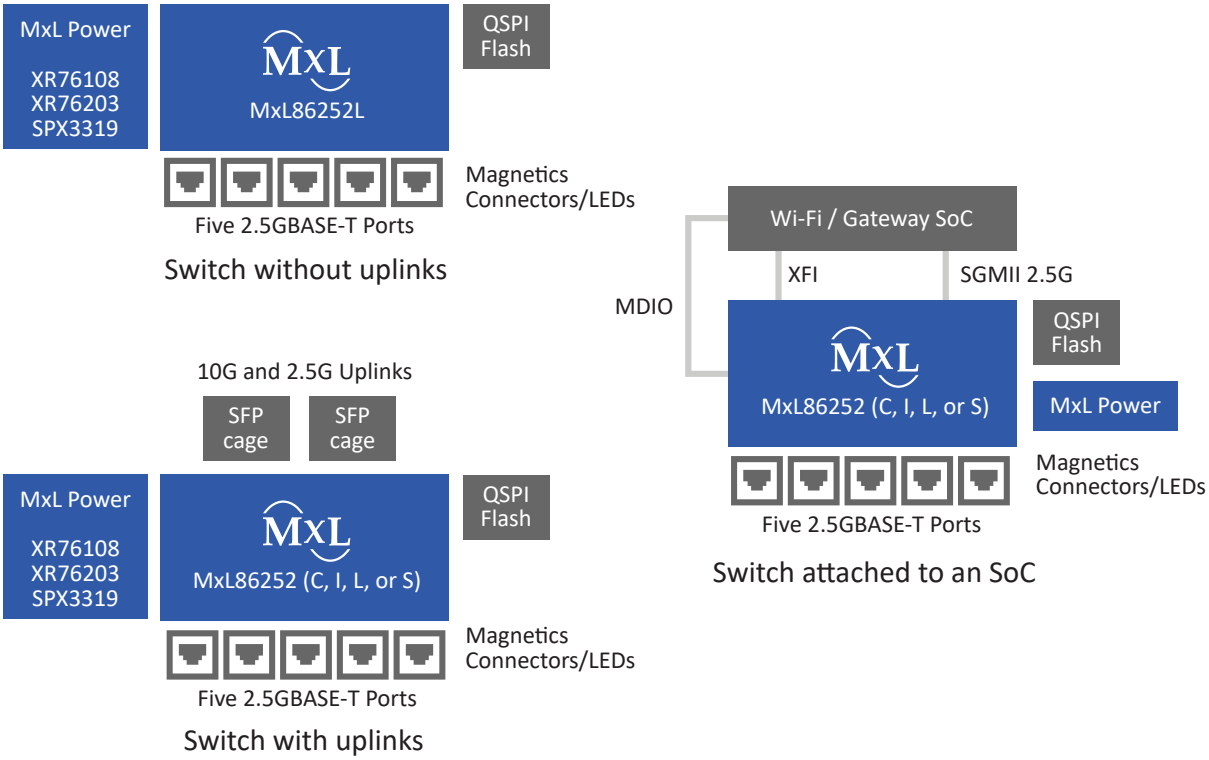
PHY Features

- 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 quality 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 (MxL86252I)

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 (MxL86252S, MxL86252I)
- Secure boot support

Application Block Diagrams



Product Information

Part Number	Ordering Code	Ethernet Ports	Uplink Ports	Web-smart Support	Temperature Range	Additional Features	Package
MxL86252L	MXL86252L-ABE-R	5	2	No	0°C to 70°C		PG-FCLBGA-277
MxL86252C	MXL86252C-ABE-R	5	2	No	0°C to 70°C		
MxL86252S	MXL86252S-ABE-R	5	2	Yes	0°C to 70°C		
MxL86252I	MXL86252I-ABE-R	5	2	Yes	-40°C to 85°C	MACsec, PTP, and SyncE support	

Evaluation Kit

Part Number	Description
MXL86252S-EVK-1	Evaluation Kit for MxL86252C, MxL86252S, and MxL86252I (equipped with MxL86252S)

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