

# Intel® Ethernet Connection C827



## Retimers extend the reach for 25GbE signals

### Key Features

- Single port 100GbE to 100GbE retimer
- Four port 25GbE to 25GbE retimer
- Single port 40GbE to 40GbE retimer
- Four port 10GbE to 10GbE retimer
- Supports independent lane speeds
- CPRI Specification V7.0
- Forward Error Correction (FEC)
- Physical Media Dependent (PMD) training
- Synchronous Ethernet (SyncE)
- Auto-negotiation
- 2.6 W (typical) at 4x 25GbE
- 14mm x 14mm FCBGA package

### Overview

The Intel® Ethernet Connection C827 retimer extends the reach of Ethernet signals. Retimers enable system designers to optimize PCB material cost for longer channel routes on server and embedded designs.

The following are the common use cases for this device:

- Per-lane 10GbE link and its multi-lane derivative - 40GbE link (4x10GbE)
- Per-lane 25GbE link and its multi-lane derivatives - 50GbE (2x25GbE) and 100GbE link (4x25GbE)
- For a complete list of supported link modes<sup>1</sup>, refer to Section 3.0 of the [datasheet](#)

By supporting a wide variety of IEEE and industry specifications for Ethernet, these retimers also enable maximum compatibility to Physical Layer (PHY) media types. The retimers also support Common Public Radio Interface (CPRI) to extend the reach between a base station and radio transceiver.

Unlike a redriver, retimers are capable of recovering and reclocking the data. Retimers support Physical Media Dependent (PMD) control function for BASE-R training and Clause 73 Auto-Negotiation, and enable Forward Error Correction (FEC) independent of the host controller.

The Intel Ethernet Connection C827 delivers consistent link behavior compliant with IEEE specifications, and eliminates the requirement to manually tune the link on individual channels.

## Operating Modes

Depending on data path requirements, the designer has the flexibility to operate the retimers in two operating modes:

**Transparent mode** retimes the data without decoding and re-encoding the PCS/FEC layers which lowers latency through the retimer. In addition, CPRI data rates are supported in transparent mode.

**Terminated mode** decodes/encodes the PCS and FEC layers. Terminated mode can enable FEC on a data path that did not originally implement this Bit Error Rate improvement algorithm. In addition, each link of the retimer can be independent which allows for the mixing and matching of different PMDs.

## Platform Support

The Intel® Ethernet Connection C827 has been validated on select Intel Reference Platforms supporting system-on-a-chip products.

Intel Reference Platforms help customers implement solutions with high speed data paths. Please contact your Intel Sales Representative for more information.

Features	Description
Transparent mode	▪ Reduce latency with transparent mode by retiming data without decoding and re-encoding the PCS/FEC layers; CPRI supported.
Terminated (protocol aware) mode	▪ PCS and FEC layers are terminated (decoded/encoded) enabling independent link segments.
Forward Error Correction (FEC)	▪ To significantly reduce Bit Error Rate (BER), the retimer can add forward error correction (FEC) in Terminated mode; both RS-FEC (Reed Solomon) and KR-FEC are supported.
Autonomous Adaptive Receiver Equalization	▪ Automatic receive optimization yields the best performance on any link, eliminating the need for manual training.
IEEE 802.3 Auto-Negotiation and PMD Training	▪ For CR and KR PMDs, Auto-Negotiation selects the highest matching speed and FEC mode, while PMD training optimizes transmitter equalization for the link partner and channel.
Independent port enabling and link speeds	▪ Each port can be configured and operated at different speeds and in different modes.
On-die thermal sensor	▪ Monitor on-die temperature; program a threshold temperature to generate an interrupt.

Interface	Description
Ethernet Interface Support	1GbE: 1000BASE-X/KX, SGMII 2.5GbE: 2500BASE-KX 10GbE: SFF-8431 SFI, 10GBASE-KR 25GbE: 25GBASE-KR/CR, 25GBASE-KR1/CR1, 25G-AUI, C2M 40GbE: XLAUI, XLPP1, 40GBASE-KR4/CR4 50GbE: 50GBASE-KR2/CR2 (Consortium) 100GbE: 100GBASE-KR4/CR4, CAUI-4
Common Public Radio Interface (CPRI) Specification V7.0	24330.24 Mb/s 12165.12 Mb/s 10137.6 Mb/s 9830.4 Mb/s 6144.0 Mb/s 4915.2 Mb/s 2457.6 Mb/s

Mechanical and Thermal	Description
Lead-free technology and RoHS-compliant	▪ Complies with the European Union directive 2011/65/EU to reduce the use of hazardous materials.
Package	▪ 14 mm x 14 mm FCBGA.
Commercial temperature SKU	▪ Intel® Ethernet Connection C827-AM will operate at 0 °C to 70 °C.
Industrial temperature SKU	▪ For extreme temperature environments, Intel® Ethernet Connection C827-IM will operate at -40 °C to 105 °C.

Product Name	Product Code
Intel® Ethernet Connection C827-AM	EZC827AM
Intel® Ethernet Connection C827-IM	EZC827IM

## Warranty

Intel limited lifetime hardware warranty, 90-day money-back guarantee (U.S. and Canada) and worldwide support.

## Product Information

For information about Intel® Ethernet Products and technologies visit: [intel.com/ethernet](https://www.intel.com/ethernet)

## Customer Support

For customer support options in North America visit:  
[intel.com/content/www/us/en/support/contact-support.html](https://www.intel.com/content/www/us/en/support/contact-support.html)

1. Link modes apply to both C827-AM (commercial temperature grade) and C827-IM (Industrial temperature grade) parts.

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