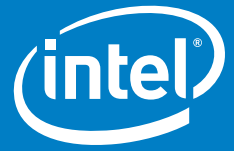


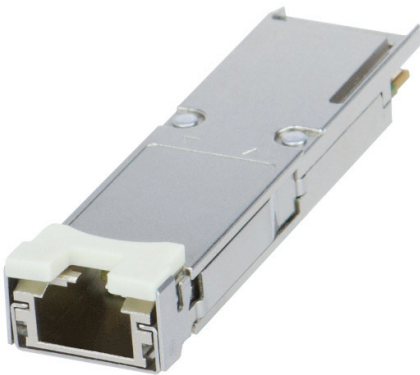
## Product Brief

Intel® Ethernet Modular Optics and Cabling Solution  
Network Connectivity



# Intel® Ethernet Modular Optics and Cabling Solution (Intel® Ethernet MOCS)

Low-Cost, High Performance Optics, for QSFP+ 4x10 Gb/s or 1x40 Gb/s Ethernet Applications



## Key Features

- Support for 40GBASE Ethernet
- Hot-pluggable QSFP+ footprint
- Supports 4 lane, full-duplex Ethernet
- Supports bit rates up to 10.3 Gb/s per lane
- Typical power dissipation < 0.5W
- Supports 64b/66b or 8b/10b encoded data
- RoHS2 compliant
- 0 °C – 70 °C operational range
- Single 3.3VDC power supply
- Link length up to 100 m on MOCS cables
- Reliable 850 nm VCSEL array laser
- Unretimed XLPPI electrical interface
- Meets Class 1 Laser safety regulations

## Product Overview

Intel is introducing a new alternative to high-cost, traditional fiber optics.

With every speed step in Ethernet performance, the industry seeks to find the lowest cost connection at the latest data rate. Historically, fiber optics are the first connection type available but are very expensive. The high cost of fiber optics often makes them a barrier to broad adoption of the latest Ethernet data rate. As the industry continues to move to faster Ethernet speeds, the industry will become more dependent on fiber optics. At higher speeds copper becomes less viable as a transport media.

Intel recognizes that for data rates starting with 40GbE Ethernet, fiber optics becomes a feasible connectivity media for broader adoption. But the industry needs a lower-cost approach to fiber optics.

Intel® Ethernet MOCS transceivers are a new low-cost alternative to 40GBASE-SR4 QSFP+ for End-of-Row (EoR) connection distances, including switch-to-switch connections. They are also a robust and reliable alternative for 40GBASE-CR4 for Top-of-Rack (ToR) connections.

Intel® Ethernet MOCS reduce costs through an innovative approach to optical transceiver design for the rack. Since there is no need to use expensive optics that have 300m reach in a rack that is only 30 meters in length, Intel's approach to delivering an optical connection for the rack begins by simplifying the design of a transceiver. By reducing the reach to 100 meters, it means you can reduce the component count and cost of a transceiver. And being cost conscious, Intel designed a new connector that eliminates high cost licensing or royalties. The result? The transceiver's power consumption is less than 0.5W for a 40 Gb/s connection, using a standard XLPPI compliant electrical interface, and can reach up to 100 meters<sup>1</sup> at a fraction of the cost of traditional optical transceivers.



## PRODUCT SPECIFICATIONS

|                    |                     |
|--------------------|---------------------|
| Module Form Factor | QSFP+               |
| Application        | 40 Gigabit Ethernet |
| Product Code       | MOT40G              |

## TRANSCEIVER SPECIFICATIONS

| PARAMETER                    | MIN                                                                                                                                                                                                              | NOMINAL | MAX  | UNIT  |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-------|
| Electrical Interface         | XLPPi (IEEE 802.3ba Annex 86A)                                                                                                                                                                                   |         |      |       |
| Number of Lanes (Electrical) | 4 Tx and 4 Rx pairs                                                                                                                                                                                              |         |      |       |
| Number of Lanes (Optical)    | 4 Tx and 4 Rx pairs                                                                                                                                                                                              |         |      |       |
| Data Rate                    | 1                                                                                                                                                                                                                |         | 12.5 | Gb/s  |
| Operating Temperature        | 0                                                                                                                                                                                                                |         | 70   | °C    |
| Power Consumption            |                                                                                                                                                                                                                  | 0.5     | TBD  | Watts |
| Fiber Length <sup>2</sup>    | 0.5                                                                                                                                                                                                              |         | 100  | m     |
| Storage Temperature          | -40°C                                                                                                                                                                                                            |         | 85°C | °C    |
| QSFP+ Module Specifications  | <ul style="list-style-type: none"> <li>• INF-8438i Specification for QSFP (Quad Small Form factor Pluggable) Transceiver</li> <li>• SFF-8436 – Specification for QSFP+ Copper and Optical Transceiver</li> </ul> |         |      |       |

## COMPATIBLE INTEL® ETHERNET CONVERGED NETWORK ADAPTER PRODUCT CODES

| CONFIGURATION                                        | PORTS | SINGLE PACK | BULK 5 PACK  |
|------------------------------------------------------|-------|-------------|--------------|
| Intel® Ethernet Converged Network Adapter X520-QDA1  | 1     | X520QDA1    |              |
| Intel® Ethernet Converged Network Adapter XL710-QDA1 | 1     | XL710QDA1   | XL710QDA1BLK |
| Intel® Ethernet Converged Network Adapter XL710-QDA2 | 2     | XL710QDA2   | XL710QDA2BLK |

## ORDERING INFORMATION

| TYPE   | BRAND NAME                                         | PRODUCT CODE | MM#    | DESCRIPTION                                |
|--------|----------------------------------------------------|--------------|--------|--------------------------------------------|
| Optics | Intel® Ethernet 40G Modular Optical Transceiver    | MOT40G       | 934346 | 40GbE QSFP+ MOT Optic, 1 Pack              |
| Optics | Intel® Ethernet 40G Modular Optical Transceiver    | MOT40GG1P10  | 934347 | 40GbE QSFP+ MOT Optic, 10 Pack             |
| Optics | Intel® Ethernet 40G Modular Optical Transceiver    | MOT40GG1P20  | 934348 | 40GbE QSFP+ MOT Optic, 20 Pack             |
| Cables | Intel® Ethernet Modular Optical Cable 1m           | MOCBL1M      | 934351 | 40GbE MOC Cable, 1 Meter, 1 Pack           |
| Cables | Intel® Ethernet Modular Optical Cable 3m           | MOCBL3M      | 934352 | 40GbE MOC Cable, 3 Meter, 1 Pack           |
| Cables | Intel® Ethernet Modular Optical Cable 5m           | MOCBL5M      | 934353 | 40GbE MOC Cable, 5 Meter, 1 Pack           |
| Cables | Intel® Ethernet Modular Optical Cable 10m          | MOCBL10M     | 934354 | 40GbE MOC Cable, 10 Meter, 1 Pack          |
| Cables | Intel® Ethernet Modular Optical Cable 15m          | MOCBL15M     | 934355 | 40GbE MOC Cable, 15 Meter, 1 Pack          |
| Cables | Intel® Ethernet Modular Optical Cable 30m          | MOCBL30M     | 934356 | 40GbE MOC Cable, 30 Meter, 1 Pack          |
| Cables | Intel® Ethernet Modular Optical Cable 40m          | MOCBL40M     | 934357 | 40GbE MOC Cable, 40 Meter, 1 Pack          |
| Cables | Intel® Ethernet Modular Optical Cable 50m          | MOCBL50M     | 934358 | 40GbE MOC Cable, 50 Meter, 1 Pack          |
| Cables | Intel® Ethernet Modular Optical MTP Patch Cable 1m | MOMTPCBL1M   | TBD    | 40GbE MOC MTP Patch Cable, 1 Meter, 1 Pack |

For more information visit: [intel.com/go/Ethernet](http://intel.com/go/Ethernet)

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<sup>1</sup> To achieve 100m reach, MOCS transceivers can be used with standard OM3 ribbon fiber with MTP connections, such as a permanently installed OM3 cable plant with an MTP patch panel. The MOCS-to-MTP patch cord is required to make the connection from the transceiver to MTP patch panel.

<sup>2</sup> With MOCS cable system (OM3 fiber).

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