

Cisco CRS 4-Port 40GE LAN/OTN Interface Module

Product Overview

This data sheet provides detailed product specifications for an important element of the Cisco[®] Ethernet Optimized solutions: the Cisco CRS 4-Port 40GE LAN/OTN Interface Module (Figure 1). The module connects directly into any 40 Gigabit Ethernet transport network, including traditional OC-768 transport networks, and provides four ports at 40 Gbps of data per port for 40 Gigabit Ethernet LAN physical layer (LAN-PHY) or Optical Transport Network (OTN) Transport Unit Level 3 (OTU-3) transport.

Figure 1. Cisco CRS 4-Port 40GE LAN/OTN Interface Module



Challenge and Solution

Significant dense Packet over SONET (POS) deployments exist despite the overwhelming industry trend toward Ethernet. Operators are looking for POS-like operations, administration, and maintenance (OAM) functions at Ethernet price points with technologies such as OTN G.709 encapsulation. Some operators have traditional transponder systems that can operate only in OC-768 and OTU-3 modes.

In addition, bandwidth growth is leading all markets, including data center operators, to move to 40 Gigabit Ethernet in the aggregation layer to handle growth in the data center.

The Cisco CRS 4-Port 40GE LAN/OTN Interface Module addresses both these needs.

The 4-port 40GE module in OTN mode with multirate serial C Form-Factor Pluggable (CFP) Fiber with Scrambled Encoding (FR) optics addresses the requirements for POS such as OAM functions at Ethernet prices, and the 4-port 40GE module in LAN mode with CFP Long-Reach (LR) or CFP Short-Reach (SR) optics provides a dense 40 Gigabit Ethernet solution for data centers and 10 Gigabit Ethernet aggregation.

Product Specifications

Table 1 lists specifications for the Cisco CRS 4-Port 40GE LAN/OTN Interface Module.

Table 1. Product Specifications

| Feature | Description |
|------------------------------|---|
| Chassis compatibility | Compatible with all current Cisco CRS-1 and CRS-3 line-card chassis |
| Software compatibility | Cisco IOS® XR Software Release 4.2.3 or later for Cisco CRS-3 platform |
| Protocols | <ul style="list-style-type: none"> • 40 Gigabit Ethernet • OTU-3 • Encapsulations: ARPA, IEEE 802.2/SAP, and IEEE 802.3/SNAP • IEEE 802.x flow control • IEEE 802.1q VLAN support and jumbo frames • IEEE 802.1p tagging • Source and destination MAC address accounting and VLAN accounting |
| Port density | Four ports of 40 Gigabit Ethernet per physical-layer interface module (PLIM) slot |
| POS feature summary | Not applicable |
| OTN (G.709) feature summary | <ul style="list-style-type: none"> • ITU G.709 • Alarm reporting: Loss of signal (LOF), loss of OTN frame (LOF), and loss of OTN multiframe (LOM) • OTU alarm indication signal (OTU-AIS), OTU backward defect indication (OTU-BDI), ODU alarm indication signal (ODU-AIS), ODU open connection indication (ODU-OCI), ODU locked (ODU-LCK), ODU backwards defect indication (ODU-BDI), ODU payload type identifier mismatch (ODU-PTIM), OTU signal fail (OTU_SF_BER), and OTU signal degrade (OTU_SD_BER) • OTU_SF_BER and OTU_SD_BER alarms are based on monitoring of OTU BIP errors with a user-configurable threshold crossing • Error counts: OTU BIP, OTU BEI, ODU BIP, and ODU BEI • Threshold crossing alerts (TCAs) for OTU BIP errors (SM-TCA) and ODU BIP errors (PM-TCA) with user-configurable threshold • Local (internal) and line (network) loopback |
| Reliability and availability | <ul style="list-style-type: none"> • Online insertion and removal (OIR) without affecting system traffic |
| Network management | <ul style="list-style-type: none"> • Cisco IOS XR Software command-line interface (CLI) • Simple Network Management Protocol (SNMP) • XML interface • CraftWorks Interface (CWI) |
| Physical dimensions | <ul style="list-style-type: none"> • Occupies one PLIM slot • Weight: 11.8 lb (5.3 kg) • Height: 20.6 in. (52.32 cm) • Depth: 11.2 in. (28.4 cm) • Width: 1.8 in. (4.57 cm) |
| Power | <ul style="list-style-type: none"> • 185W |
| Environmental conditions | <ul style="list-style-type: none"> • Storage temperature: (–40 to 158°F (–40 to 70°C)) • Operating temperature: <ul style="list-style-type: none"> ◦ Normal: 32 to 104°F (0 to 40°C) ◦ Short-term: 23 to 131°F (–5 to 55°C) • Relative humidity: <ul style="list-style-type: none"> ◦ Normal: 5 to 85% ◦ Short-term: 5 to 90% but not to exceed 0.024 kg water/kg of dry air <p>Note: Short-term refers to a period of not more than 96 consecutive hours and a total of 360 hours, but not more than 15 instances in 1 year.</p> |

Approvals and Compliance

Table 2 provides standards compliance information, Table 3 provides additional specifications, and Table 4 provides performance monitoring parameters.

Table 2. Compliance and Agency Approvals

| Feature | Description |
|---|---|
| Safety standards | <ul style="list-style-type: none"> • UL/CSA/IEC/EN 60950-1 • IEC/EN 60825 Laser Safety • ACA TS001 • AS/NZS 60950 • FDA—Code of Federal Regulations Laser Safety |
| EMI | <ul style="list-style-type: none"> • FCC Class A • ICES 003 Class A • AS/NZS 3548 Class A • CISPR 22 (EN55022) Class A • VCCI Class A • BSMI Class A • IEC/EN 61000-3-2: Power Line Harmonics • IEC/EN 61000-3-3: Voltage Fluctuations and Flicker |
| Immunity (basic standards) | <ul style="list-style-type: none"> • IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV contact, 15-kV air) • IEC/EN-61000-4-3: Radiated Immunity (10V/m) • IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV power, 1-kV signal) • IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM) • IEC/EN-61000-4-5: Signal Ports (1 kV) • IEC/EN-61000-4-5: Surge DC Port (1 kV) • IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10 Vrms) • IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30A/m) • IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations |
| ETSI and EN | <ul style="list-style-type: none"> • EN300 386: Telecommunications Network Equipment (EMC) • EN55022: Information Technology Equipment (Emissions) • EN55024: Information Technology Equipment (Immunity) • EN50082-1/EN-61000-6-1: Generic Immunity Standard |
| Network Equipment Building Standards (NEBS) | <p>This product is designed to meet the following requirements (qualification in progress):</p> <ul style="list-style-type: none"> • SR-3580: NEBS Criteria Levels (Level 3) • GR-1089-CORE: NEBS EMC and Safety • GR-63-CORE: NEBS Physical Protection |

All specifications in Table 3 are worst-case values for the operational life of the product.

Table 3. Additional Specifications:

| 40 Gigabit Ethernet CFP Optics | Specifications |
|--------------------------------|--|
| CFP-40G-SR4 | Supports link lengths of up to 100m and 150m over laser-optimized OM3 and OM4 multimode fiber cables, respectively |
| CFP-40G-LR4 | Supports link lengths of up to 10 km over a standard pair of G.652 single-mode fiber with duplex SC connectors |
| CFP-40G-FR | Supports link lengths of up to 2 km over a standard pair of single-mode fiber with duplex SC connectors |

Performance Monitoring Parameters

| Area | Parameter Name | | Description |
|------|---------------------|---------|------------------------------------|
| OTN | OTUk SM | ODUk PM | Frame structures |
| | BBE-SM | BBE-PM | Number of background block errors |
| | BBER-SM | BBER-PM | Background block error ratio |
| | ES-SM | ES-PM | Number of errored seconds |
| | ESR-SM | ESR-PM | Errored seconds ratio |
| | SES-SM | SES-PM | Number of severely errored seconds |
| | SESR-SM | SESR-PM | Severely errored seconds ratio |
| | UAS-SM | UAS-PM | Number of unavailable seconds |
| | FC-SM | FC-PM | Number of failure counts |
| FEC | Bit errors | | Number of corrected bit errors |
| | Uncorrectable words | | Number of uncorrectable words |

Ordering Information

To place an order, contact your local Cisco representative or visit the Cisco Ordering homepage at www.cisco.com. Use the ordering information in Table 5.

Table 4. Ordering Information

| Part Number | Product Name |
|--------------|--|
| 4-40GE-L/OTN | Cisco CRS 4-Port 40 Gigabit Ethernet LAN/OTN Interface Module |
| CFP-40G-LR4 | Cisco multirate 40GBASE-LR4 and OTU3 C4S1-2D1 for SMF, 1310-nm window, SC duplex connector |
| CFP-40G-SR4 | Cisco 40GBASE-SR4 CFP transceiver module for MMF, 4-lanes, 850-nm wavelength, 12-fiber MPO/MTP connector |
| CFP-40G-FR | Cisco 40GBASE-FR transceiver module in a CFP form factor that supports 2km reach on a single mode fiber |

Service and Support

Cisco delivers innovative services programs through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco Services helps you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, contact your local Cisco representative or visit www.cisco.com.

For More Information

For more information about the Cisco CRS 4-Port 40GE LAN/OTN Interface Module, contact your local Cisco representative or visit www.cisco.com/go/crs.



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)