

10G Line Interface Modules

GMCR10G, GMCR10GF

- ✓ *Bi-Directional 10G Transponder with 10G Ethernet, OC192/STM64, and 10G Fiber Channel Support*
- ✓ *Full 3R Support, 1310 nm Client Interface*
- ✓ *Physical Layer PM, Loopback Tests*
- ✓ *100 km Dispersion Limit, Line Side*
- ✓ *Up to 10 km Client-Side Distance*
- ✓ *Line / Client Shutdown Options*

High-Speed 10G Transponder

As 10G applications continue to proliferate, from carrier backhaul through customer interfaces, the requirements for high-speed, carrier-class transport have increased. DWDM and 10G services include Ethernet, Sonet/SDH, and Fiber Channel, all providing mission critical transport for applications, services, and connectivity to external sites, at the high speed data rates customers require. Additional module features include optional FEC encapsulation, full 80 channel tunability, and CPE disable features for relaying line-side failures to attached customer equipment.

The GMCR and GMCRF modules are bi-directional 2-slot transponders for 10G services. The line-side interface supports up to 100 km spans over standard SMF fiber to another similar unit. To extend transmission distance, complete signal regeneration capability is provided for this 10.5Gbps rate signal. Data rate support for the linecards includes: 10G Ethernet, OC192/STM64, and 10G Fiber Channel.

The regenerating 3R function performs pulse power amplification, reshaping, and retiming. This function guarantees signal quality and can function as a regenerative wavelength converter or repeater in regional systems. When coupled with GigaMux DWDM dispersion compensation modules and amplifier modules, the basic 100 km span is extended to hundreds of kilometers before regeneration is necessary.

GMCR and GMCRF modules support advanced monitoring features such as integrated power monitoring and loopbacks for both client- and line-side. Adjustable thresholds supply physical layer PM data to detect signal degradations.

Technical Specifications

Dimensions

- Chassis space: 2 slots

Power

- 40 watts
- Hot swappable

Interfaces

- SC/UPC for client and line-side connections

Standards Support

- ■ Client-Side Specifications
 - Data rate: 10.5 Gbps
 - Fiber interface: G.652
 - Operating wavelength range: 1290-1330 nm
 - Maximum distance supported: 10 km
- ■ Transmitter
 - Source type: SLM
 - Spectral characteristics: max. RMS width 1 nm
 - Mean launched power: maximum -4.2, minimum -5.0 dBm
 - Min. extinction ratio: 6.0 dB
 - Dispersion tolerance: 164 ps / nm
- ■ Receiver
 - Receiver sensitivity OMA: -13.2 dBm
 - Stressed receiver sensitivity: -10.7 dBm
 - Power overload: 1 dBm
 - Reflection at the receiving point: -12 dB

Protocol Support

- ■ Line-Side Specifications
 - Fiber interface: G.652
 - ■ Transmitter at the output point
 - Source type: SLM
 - Line coding: NRZ
 - Spectral characteristics: -20 dB down line-width (max.) 0.12, nm
 - Side mode suppression ratio (min.): 30 dB
 - Nominal central frequency: 192.1 to 196.1 THz
 - Max. central frequency deviation +/-: ± 0.04 GHz
 - Channel spacing: 100/50 GHz
 - Mean launched power: max. +5 dBm, min. -1 dBm
 - Minimum extinction ratio: 10 dB
 - Eye diagram pattern (GR 253): X1. >0.25 UI, Y1 <25%
 - Optical return loss (min.) (including any connectors): 24 dB
 - Dispersion tolerance: 1,800 ps / nm
 - ■ Receiver at receiving point
 - Minimum sensitivity (BER-1.0E-12) dBm -22
 - 10G linecards (no FEC): dBm -22
 - 10G linecards (with FEC): dBm -24
 - Minimum overload for (BER-1.0E-12) dBm -8
 - Reflectance (max.) dB -27
 - Minimum OSNR for a 1.0E-12 BER dB
 - 10G linecards (no FEC): OSNR 26dB
 - 10G linecards (with FEC): OSNR 20dB
- ■ Performance Monitoring
 - Physical layer PM parameters: LBC, OPT, OPR, LTEMP
 - Facility alarms: LOS
 - Historical data: OPT-High / Low, LBC High, OPR-High / Low, LTEMP, 15-minute, 24-hour

Operating Requirements

- 5° C to + 40° C

Ordering Information

GMCRF-10G-FC	10G Fiber Channel with FEC
GMCRF-10G-LR	10G Ethernet with FEC
GMCRF-10G-LW	OC192/STM64 with FEC
GMCR-10G-FC	10G Fiber Channel, no FEC
GMCR-10G-LR	10G Ethernet, no FEC
GMCR-10G-LW	OC192/STM64, no FEC

All linecards available with 80 channel tunable options



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