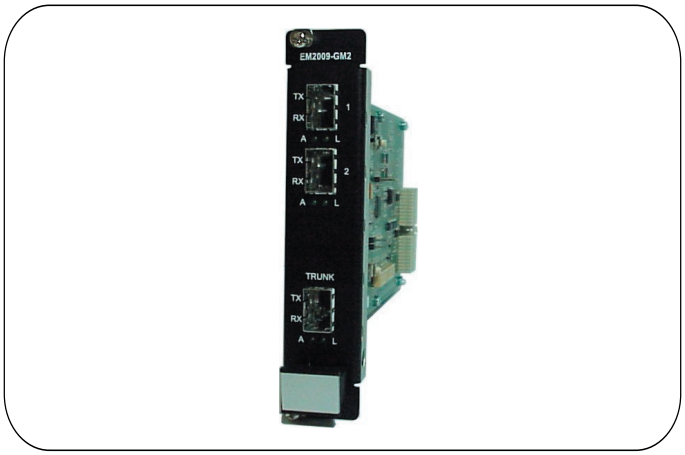
MRV Communications, Inc.

FIBER ACCESS SOLUTIONS

Datasheet

LambdaDriver® Module EM2009-GM2

2-port Gigabit Ethernet multiplexer



EM2009-GM2

Features

- Transport 2xGE services over one single aggregate wavelength.
  The aggregate wavelength can be regular, CWDM or DWDM.
- Fiber Driver-LD (LambdaDriver®) transponder slot size
- SFP interface on all the ports
- Trunk port data rate: 2.5 Gbps
- Performance monitoring
- 2 loopbacks per port
- Automatic Laser Shutdown (ALS)
- Link Integrity Notification (LIN)

Applications

- GE TDM aggregation for further CWDM/ DWDM transport
- Doubling capacity of existing GE links over Multimode or Singlemode fiber

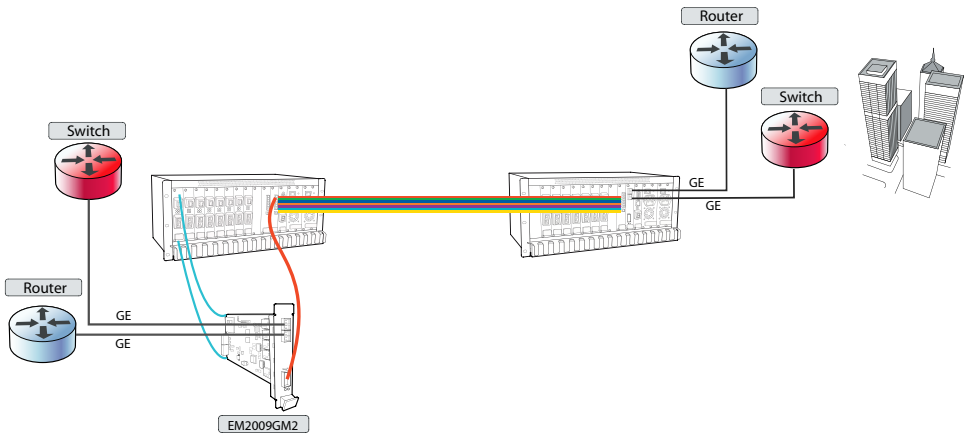
Overview

MRV offers a complete family of TDM (Time Division Multiplexing) access modules designed to boost wavelength as well as fiber utilization. The EM2009-GM2 allows for a significant cost reduction and higher fiber utilization when compared to pure optical multiplexing solutions. The EM2009-GM2 module aggregates 2 Gigabit Ethernet tributaries into a 2.5 Gbps aggregated uplink port. To optimize each port interface as needed, all ports use standard SFP (Small Form Pluggable) field-installable transceivers.

The EM2009-GM2 supports a variety of fiber optic SFPs for single mode and multi mode fibers, using different wavelengths and covering various distances. For this reason, it is an excellent tool for wide range of applications. For example, it can support 1000BaseTx interfaces by using MRV's 10/100/1000BaseTx SFP. Using a CWDM SFP on the aggregation port allows direct connection to CWDM OADM or Mux/DeMux without the need for a CWDM transponder. Such an application not only saves transponder cost but, in some cases, even allows for the usage of lower-cost CWDM technology instead of DWDM technology, thanks to a reduced WDM channel count resulting from doubling the capacity of a single wavelength. The simplest application is transporting 2 x GE data streams to distances of up to 90 Km over one or two fibers of a regular singlemode cable.

Larger aggregation of channels can be achieved by using the DWDM (Dense Wavelength Division Multiplexing) or CWDM (Coarse Wavelength Division Multiplexing) technologies. Placing 2 GE services over one CWDM/DWDM wavelength will double the capacity of an existing CWDM/DWDM system. Thus, 64 GE applications will be run over one fiber using 32 wavelengths.

Powerful diagnostic tools are available on the GM2. These include two loopback functions per port (one for each traffic direction). These loopback functions together with the Remote Laser Shutdown capability assists in pinpointing the problem



source. In addition to the standard digital diagnostics provided by the SFPs, the GM2 measures Bit Error Rate (BER) on each port to provide *per-channel* Performance Monitoring. The LIN (Link Integrity Notification) feature of the GM2 notifies terminal equipment of link failure by cutting off laser power on the access side whenever no power is received from the WDM side, and vice versa.
The EM2009-GM2 module can be hosted in all the LambdaDriver® transponder slots in all the Fiber Driver LD chassis (LD400, LD800 or LD1600). A combination of the EM2009-GM2 and the LambdaDriver® DWDM or CWDM achieves extremely high levels of density.

Technical Specifications

GE Interfaces	SFP receptacle for 1-Gbps SFP
TDM trunk interface	SFP receptaclefor 2.5-Gbps SFP
Management	SNMP and craft interface (RS-232) as part of the LD400/800/1600 chassis
Temperature	Operating: 0 – 40 °C, non condensing Storage: 0 – 70 °C
Front Panel indicators	Loss of Signal (Link) and transmission(Activity) indications for all ports

Ordering Information

Subrate TDM Mux	
EM2009-GM2	2GE ports TDM Multiplexer channel card with SFP receptacles
LD1600 Platform	
LD1600	Lambda Driver-1600, 16 channels, Chassis without power supply (EM2005 power supplies should be ordered separately)
EM2005-PS/AC	AC power supply for the LD1600 (90-240V AC)
EM2005-PS/DC	DC power supply for the LD1600 - (48V AC)
EM1600-MNG	MNG Management Module for the Lambda Driver-1600
LD800 Platform	
LD800/AC	Lambda Driver-800, 8 slot Chassis with single AC power supply (90-240V AC)
LD800/DC	Lambda Driver-800, 8 slot Chassis with single DC power supply (48V DC)
LD800/2AC	Lambda Driver-800, 8 slots Chassis with dual power AC supply (90-240V AC)
LD800/2DC	Lambda Driver-800, 8 slots Chassis with dual power DC supply (48V DC)
EM800-PS/AC	Redundant power supply for the LD800/AC (90-240V AC)
EM800-PS/DC	Redundant power supply for the LD800/DC (48V DC)
EM800-MNG	MNG Management Module for the Lambda Driver-800
LD400 Platform	
LD400/AC	Lambda Driver-400, 4 slot Chassis for WDM with single AC power supply (90-240V AC)
LD400/DC	Lambda Driver-400, 4 slot Chassis for WDM with single DC power supply (48V DC)
LD400/2AC	Lambda Driver-400, 4 slots Chassis for WDM with dual power AC supply (90-240V AC)
LD400/2DC	Lambda Driver-400, 4 slots Chassis for WDM with dual power DC supply (48V DC)
EM400-PS/AC	Redundant power supply for the LD400/AC (90-240V AC)
EM400-PS/DC	Redundant power supply for the LD400/DC (48V DC)
GE-SFP transceivers	
SFP-EFG	SFP Copper (10/100/1000) RJ45 (must be used in pairs with MRV Pluggable Optical Modules)
SFP-G-SX	SFP 1000Base-SX, MM, 850nm, 0-550m
SFP-G-MX	SFP 1000Base-SX, Extended MM, 1310nm, 0-2km
SFP-G-LX	SFP 1000Base-LX, SM, 1310nm, 10km
SFP-GD-ELX	SFP 1000Base-ELX, SM, 1310nm, 25km, with Digital Diagnostics.
SFP-GD-XD	SFP 1000Base-XD, SM, 1550nm, 50km
SFP-GD-ZX	SFP 1000Base-ZX, SM, 1550nm, 80km, with Digital Diagnostics
SFP-GD-EZX	SFP 1000Base-EZX, SM 1550nm, 120km, with Digital Diagnostics.
SFP-GCWXD-XX	SFP 1000Base-XD, SM CWDM (XX=Wavelength 1470-1610nm), 20db, CWDM
SFP-GDCWZX-XX	SFP 1000Base-ZX, SM CWDM (XX=Wavelength 1470-1610nm), 24db, CWDM with Digital Diagnostics.
SFP-GDCWEZX-XX	SFP 1000Base-EZX, SM CWDM (XX=Wavelength 14710-1610nm) 120km with Digital Diagnostics.
2.5Gbps SFPs	
SFP-OC48-IR2	SFP OC48 IR2, SM,1550nm, 50km
SFP-OC48-MMX	SFP OC48, Extended MM, 1310nm, 0-2km.
SFP-OC48D-SR1	SFP OC48 SR1, 1310nm, 2km, with Digital Diagnostics.
SFP-OC48D-IR1	SFP OC48 IR1, SM, 1310nm, 15km with Digital Diagnostics.
SFP-OC48D-IR2	SFP OC48 IR2, SM,1550nm, 50km with Digital Diagnostics.
SFP-OC48D-LR2	SFP OC-48 IR2, SM 1550nm, 80km, with Digital Diagnostics.
SFP-48DCWIR-XX	SFP OC-48 IR, SM CWDM (XX=Wavelength 1470-1610nm), 50km, with Digital Diagnostics.
SFP-48DCWLR-XX	SFP OC-48 LR, SM CWDM (XX=Wavelength 1470-1610nm), 80 km, with Digital Diagnostics.

Note: For DWDM applications, please consult your local representative.
For more information about the LambdaDriver® solution components please refer to the LambdaDriver® datasheet

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