EMPOWERING THE OPTICAL EDGE

Datasheet

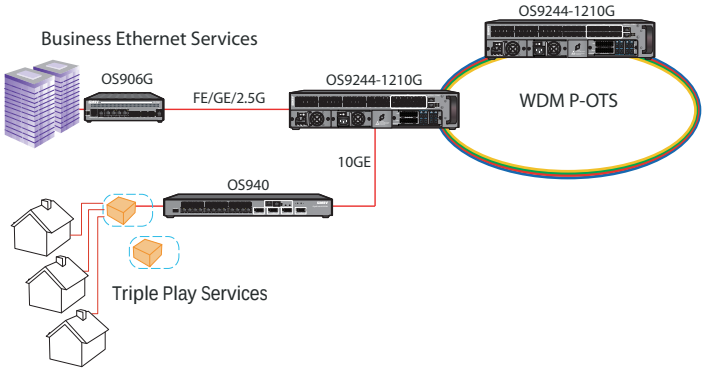
OptiSwitch® 9244-1210G
Carrier-Ethernet Packet-Optical Aggregation

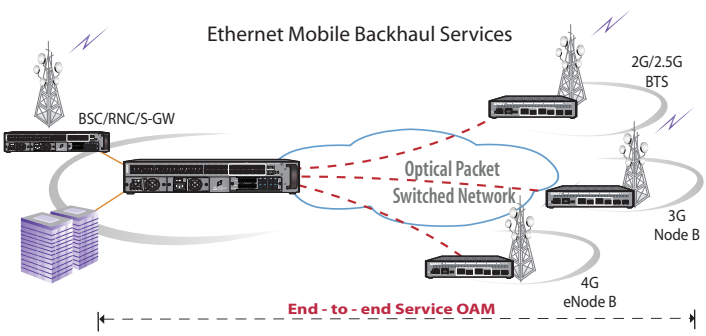
OS9244 - 1210G

MRV OptiSwitch® 9244-1210G is a fully compliant MEF Carrier-Ethernet 2.0 and compact packet-optical aggregation platform for 1st and 2nd mile optical FE , GE and 10GE NGN infrastructures.

The platform is one of the industry's highest port density 2RU aggregation platform with a total bandwith support of 200Gbps with 32 x FE/1GE/2.5GE (SFP) ports + 12 x 1GE/10GE (SFP+) ports.

The platform's multi-purpose service slot can be populated with all MRV's OptiSwitch modules including CES (E1/T1 & STM-1/OC3) for delivery of TDM services over Ethernet networks, and WDM Optical Transport.
The OptiSwitch 9244-1210G provides service providers with a full suite of carrier-grade Ethernet services along with high-availability, enhanced quality of service, security, Operations, Administration and Maintenance (OAM) support, and Packet-WDM. The uniqueness of a full suite of Carrier-Ethernet and MPLS tools makes this platform a perfect solution for delivery of SLA-based business Ethernet and Mobile Backhaul services.





Product highlights

- Cost-effective 1st - mile Carrier Ethernet aggregation platform
  - Offloads Provider Edge 10GE ports
- Very high port density to form factor ratio with lowest power consumption
  - Compact 2RU form factor with ETSI compatible depth for space saving
- MRV Unified Master-OS® control plane for Metro-E services
  - Simplifies operation and management integration with OSS
- MEF-compliant Carrier Ethernet 2.0 services
- Non-blocking hardware architecture
- Physical interfaces:
  - 32 x 100 (SGMII)/1000/2000 FX ports
  - 12 x 1000FX / 10000FX ports
- Supports 10GE LAN/WAN(STM-64/OC192) PHY
- Flexible UNI/NNI interfaces - 100FX/1000FX/2000FX and 10GE
  - Same device for all aggregation scenarios
  - Support for jumbo frames on all ports
- Exceptional variety of Optical Layer 1 & Layer 2 VPN Services
  - EPL X-connect, E-Line, E-Tree and E-LAN
  - Any-to-any transparent cross-connect - eROADM services
- Advanced traffic management with line rate performance
  - Classification, policing, metering, marking per-flow QoS
  - Low-latency and precise service rates
- Unmatched flexibility of Ethernet Virtual Circuits
  - Selective Q-in-Q and VLAN translation
- End-to-end Ethernet service OAM to monitor SLAs
  - Simplifies, monitors and troubleshoots services/applications
  - Standards compliance per CFM IEEE802.1ag / PM ITU-T Y.1731
  - RFC 2544 throughput measurements
  - IP SLA measurements
  - EFM link OAM – IEEE802.3ah
- Protection mechanisms
  - ERPS G.8032 and ELPS G.8031
  - Link Protection 1:1 (LOS) and n+1 (LAG)
  - Sub 50ms SONET-like recovery and deterministic SLA
- Multicasting service for IP-TV Triple Play
- Hot-swappable fully redundant power supplies
- Hot-swappable pluggable fan tray
- sFlow support for Application-Aware Networking
- Excellent price/performance for rapid ROI
- Zero-touch provisioning with rapid service turn-up (with Pro-Vision Service Provisioning and NMS)

Applications

- IPTV services
- 1st-mile aggregation for business Ethernet services
- Cell-site aggregation for Ethernet mobile backhaull
- 10GE and fractional sub-10GE ERPS G.8032 and ELPS G.8031protected services
- Lambda services – fiber optimization through C/DWDM integration

OptiSwitch® Metro Ethernet solution meets IEEE, ITU, IETF, and MEF standards, offering complete control to simplify deployment and management, while maintaining full interoperability and guaranteed SLAs.

Features and Solution Benefits

OS9244-1210G platform is a high-performance Carrier Ethernet Aggregation Platform with non-blocking hardware and software architecture engineered for deployment in new and demanding packet-optical network environments to support the provider's value-added service offering. By integrating packet switching and aggregation with WDM transport, the OS9244-1210G enables increased efficiencies in bandwidth utilization, optimizing interfacing, and simplifying the network by eliminating the need for dedicated hardware. For service providers who build next-generation optical networks, the consolidation of WDM services with intelligent traffic forwarding on the same platform offers significant savings in capital expenditure.

Multipurpose Service Interfaces

The platform offers a unique combination of features and optical interfaces that enable suitable, easy, and flexible field configurations while making it ideal for maintenance and inventory.

The integration of CWDM / DWDM eliminates the need for a transponder in the network, and offers better fiber optimization along physical services separation with dedicated 1Gbps and 10Gbps rates for premium optical services with the same concept as that of legacy "leased-line" services.

Port numbering	Service Interface Options
Ports 1-32	100BaseFX - SGMII 100FX SFPs 1000BaseFX - standard GigE SFPs 2.5Gbps - 2000BaseFX - Standard multi-rate SFPs
Ports 33-44	1000BaseFX - standard GigE SFPs 10000BaseFX - SFPs +
Multi-service Expansion Slot	E1/T1 CES STM-1/OC3 CES **WDM Services** ITU-T G.694.1 Standard (DWDM) ITU-T G.694.2 Standard (CWDM) OADMs, MUX/DEMUX

- All Interfaces can be configured as UNI / NNI to enable access to edge and intra-network services
- 100FX (SGMII) and 1000FX interfaces can be muxponded over 10GE interface at dedicated wavelength
- Hot swappable SFP/SFP+ pluggable optics to ensure flexible distance, cost and performance
- Pluggable SFP/SFP+ ports support distances from short to long haul, single strand and CWDM and DWDM optics
- Remote Optical Level monitoring and alarm thresholds of ports

End-to-end Service Provisioning and OAM

Pro-Vision® is MRV's carrier-class service provisioning & management system that offers service providers a wide range of applications & tools to fully manage and control large-scale MEF compliant Carrier Ethernet based data, voice, and video services. The GUI-based software allows service provisioning, monitoring, and troubleshooting from an easy-to-use central network management application. Pro-Vision complements the OptiSwitch 900 Carrier Ethernet Demarcation and OptiSwitch 9000 packet -optical aggregation portfolio. Pro-Vision provides rapid service creation, comprehensive performance monitoring (including real-time performance metrics), port, and EVC utilization. Pro-Vision offers Web-based customer portal that allows the monitoring of real time service performance and SLA verification based on the customer's view. Pro-Vision supports standard based Web services northbound interface using SOAP/XML, CORBA, and SNMP for interconnection with SP & equipment vendor OSS systems.

End-to-end service provisioning and activation across network infrastructure

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MEF compliant Carrier Ethernet 2.0 Services

- UNI Type 1 and Type 2 (MEF21)
- External-NNI
- EPL, E-Line, E-Tree & E-LAN – MEF9
- EPL, E-Line, E-Tree & E-LAN Traffic Mgt. – MEF14
- OAM Implementation Agreement (IA) – MEF17
- All interfaces can be configured as UNI / ENNI

Packet Switching Services

- 200Gbps (Full-duplex) non-blocking wire-speed architecture
- Configurable for jumbo frames per port/EVC
- Packet buffer management
- IEEE802.1Q and IEEE802.1ad provider bridges
  - 4K active VLANs / EVCs
  - Selective Q-in-Q stacking per ACL criteria
  - Configurable Ethertype values
  - Private VLAN
- Transparent cross-connect mode
  - Per System, per port, or per EVC non-learning mode
- Learning table limit per VLAN/port
- Layer 2 control protocols tunneling
- UNI protected ports/Layer 1 filtering
- Provider Backbone Bridging (PBB) per 802.1ah*

Protection Services

- Sub 50 ms ring and dual–homed topologies
- ITU-T G.8032 v2 Ethernet Ring Protection Switching
- ITU-T G.8031 Ethernet Linear Protection Switching
- MSTP per IEEE802.1s
- Link Aggregation (LAG n+1) – static and LACP
  - Load balancing based on L2-3-4 headers
- Link level 1:1 Loss of Signal (LOS) protection
- CFM (OAM) messages for fault detection and link fallback
- Bidirectional Link Fault Reflection
- Link flap protection and damping
- Unidirectional Link Detection

Multicast and IP Services

- Wire speed multicast replication
- IGMP v1,v2 snooping , proxy and fast leave
- Wire-speed IPv4 / IPv6* packet routing
  - RIP, OSPF, IS-IS, BGP-4, VRRP
  - Secondary interfaces
  - DHCP server/client/relay

MPLS Services

- Ethernet over MPLS pseudowire with Traffic Engineering
- H-VPLS dual-homed spoke MTU-s
  - LDP, RSVP-TE, OSPF-TE, ISIS-TE, CSPF*
- MPLS LER & LSR functionality
- MPLS-Transport Profile – MPLS-TP*

Security

- Wire-speed ACLs on L2-3-4 headers
  - Up to 8K rules
  - Ingress and Egress ACLs
  - Multiple actions in single ACL
- CPU Denial-of-Service protection
- MAC filters and MAC limit per port/per VLAN
- UNI Broadcast/Multicast/Unicast rate control
- Flood limiting of OAM frames
- ARP rate control
- DHCP option 82 & option 60
- ACL for management sessions from NOC
- View-based Access Control Model (VACM)

Traffic Management

- Inbound & Outbound traffic management per flow/EVC
- In-service circuit parameter changes (hitless ACL)
- Dual-rate 3-color rate limit per flow or aggregate
  - Granular CIR/EIR rates up to 10GE
- Color-Aware BW-Profile
- WRED
- Classification by any L2-3-4 criteria and combinations thereof
  - Physical port, MAC, Ethertype, VLAN, IP/TCP/UDP
- IEEE 802.1p (VPT), DiffServ (IPv4 & IPv6 TC)
- Marking/remarking profiles between layers
  - 802.1p, DSCP & MPLS EXP
- 8 hardware queues per port & configurable SL
- Per flow SLA metrics
  - Per UNI, CoS, EVC, control protocols
  - 16,000 counters

Availability

- 1:1 hot-swappable dual redundant power – AC/DC mix
- Hot-swappable pluggable fan tray
- Temperature sensor for environmental alerts
- Dual image & rollback processes

Management & Diagnostics Tools

- Industry Standard CLI
- Out-of-band management
  - EIA-232 port
  - Ethernet port
- Out-of-band Ethernet management - Dedicated ETH port
- TELNET, SSH v2, SNMPv3, RMON (4 groups)
- Port mirroring - ingress & egress traffic to analyzer port / VLAN
- Remote service/flow mirroring per ACL
- PING, Traceroute, DNS lookup, TCP dump (built-in sniffer)
- Management ACL for trusted connections (TELNET/SSH/SNMP)
- Hierarchical Administration policy
- RADIUS / TACACS+ AAA for management sessions
- Configuration load/save using FTP, Secure Copy (SCP)
- Network Time Protocol (NTP)
- Internal/Remote Syslog
- Scripting tool for macro configurations & maintenance
- Scheduler for automated execution of pre-specified commands (time/day/cycle)
- Remote auto-configuration - DHCP server/client/relay
- IPv6 management
- DPOE 1.0 DEMARC auto configuration*

Standard Operation, Administration & Maintenance

- End-to-end Service OAM IEEE802.1ag
  - Connectivity Fault Management per service MEP/MIP
  - In-service EVC loopbacks, Linktrace & continuity check
- End-to-end Performance Measurement ITU-T Y.1731 & IP SLA
  - MEF SOAM PM (MEF 35)
  - Per service Jitter, Latency & Loss - nano second precision
  - RFC2544 throughput measurements for service baseline
- EFM Link OAM - IEEE802.3ah
  - Discovery, port-loopback, remote failure indication
- Optical signal level monitoring (SFP SFF-8472)
- Remote failure notification/reflection
- ITU-T Y.1563 service availability
- ITU-T Y.1564 Service Activation*
- Dying Gasp under EFM Link OAM per IEEE802.3ah
- MEF 10.2.1 service resiliency
- TWAMP reflector (RFC5357)
- JDSU Loopback Protocol*

* Future software release

Technical Specifications

Standard compliance	FCC Part 15 (Class A); EMC Directive: Emission (Class A) and Immunity; LVD Directive: Electrical Safety; CE ; TUV-R mark (Canada, USA); GOST; RoHS Directive, REACH SVHC, WEEE Directive; ETSI compatible depth; Designed to comply with NEBS Level 3; C-Tick.			
Operating Temperature	0 to 50 ºC (32 to 122 ºF)			
Storage Temperature	-40 to +70 ºC (-40 to 158 ºF)			
Humidity	10% to 85% non-condensing			
Diagnostic LEDs	Power Supply, Management, Temperature, Fan, Link, and Activity			
Rack Mounting	19" or 23" racks , compact 2 RU height			
Maintainability	Front facing system configuration: eliminates the need to dismount the system for maintenance or installation of new hardware following initial installation Back-to-back installation in Telco racks: Doubling the 'port-per-rack' density.			
Performance	Non-blocking 200G (full-duplex) architecture. Full-wire packet forwarding on all ports (297 Mpps)			
Physical dimensions WxDxH (mm/inch)	447.6x300x88.1 mm 17.62x11.81x3.46 inch			
Weight (kg. /lbs.)	5.450 kg/11.9 lbs (fully loaded with 2PS 7.050 Kg/15.4 lbs)			
MTBF HRS @25C /77F	201,721			
Power Specifications (AC/DC)Hot swappable dual redundant Power Supplies	AC Input Voltage Line frequencies 50-60Hz	DC Input Voltage Options	Power consumption(W) Min.	Max
	100-240 VAC	-48VDC (-36VDC to -60VDC)	100W	135W

Ordering Information

P/N	Description
OS9244-1210G	OptiSwitch® 9244-1210G 1st mile Carrier Ethernet aggregation platform with 32 x 100FX (SGMII)/1000FX/2000FX SFP and 12 x 1000FX/10000FX SFP+ ports. Optional multi-service slot AC/DC power supplies to be ordered separately.
Hot-swappable power supplies for OS9000 series	
EM9015-PS/AC	AC power supply for the OptiSwitch® 9244 Series (100 - 240V AC)
EM9015-PS/DC	DC power supply for the OptiSwitch® 9244 Series (24 - 48V DC)
Accessories	
MS9000-Blank	Blank panel for multi-service slot
EM9005-Blank	Blank panel for Power Supply
EM9005-BR-2-C	23" mounting bracket
EM9005-FAN-T	Spare part - Fan Tray for OS9124-410G and OS9244-1210G models
MS9000-FG-A	Fiber guard tray for OS9244-1210G model
Master-OS™ - MPLS Software Upgrade Package for OS9244-1210G model	
** For ordering codes of SFP and SGMII pluggable optics, please visit MRV's web site*	
** For ordering codes of CWDM/DWDM fiber optimization modules, please contact info@mrv.com*	
CES line cards	
EM9-CES-4T1c	4-port T1 Circuit Emulation Service module with high-precision clock
EM9-CES-4E1c	4-port E1 Circuit Emulation Service module with high-precision clock
EM9-CES-OC3	1-port OC-3/STM -1 - 1:1 protected - Circuit Emulation Service Aggregation module
EM9-SYNC-MBH*	SyncE and IEEE1588v2 (Master/Slave/BC) Timing and Synchronization supporting module