

## Cisco Route Processor Module XF

The Cisco® Route Processor Module XF (RPM-XF) is a high-performance integrated IP/Multiprotocol Label Switching (MPLS) services for the Cisco MGX® 8880 Media Gateway, Cisco MGX 8950 Multiservice Switch, and Cisco MGX 8800 Series Multiservice Switches. Its Cisco Parallel Express Forwarding (PXF) adaptive processor provides low latency through hardware-based forwarding for flexible service delivery in conjunction with Cisco IOS® Software. The Cisco RPM-XF enables the switch to provide high-performance IP/MPLS-based VPN and quality-of-service (QoS) services along with ATM and other multiservice capabilities. This enables the MGX to offer Layer 3 services as well as enable migration from Layer 2 to Layer 3 networks. The Cisco RPM-XF is used by small and large Cable, Wireline, and Wireless Service providers as well as enterprise customers.

### Applications

- IP/MPLS-enabled multiservice networks for service provider and enterprise networks
- Differentiated IP Radio Access Network (IPRAN) voice and data service aggregation using MLPPP protocol
- Voice-over-IP (VoIP) services with minimal latency and without service interruption due to failure
- Support for IPv4 Multicast and Multicast VPN
- Bandwidth savings through Routing Table Protocol (RTP) header compression for IP services
- New IP Next-Generation Network converged wireline and wireless services



## Product Specifications

The Cisco RPM-XF is a hot-swappable full-height card for the Cisco MGX 8830, MGX 8850, MGX 8880, and MGX 8950 switches. The Cisco RPM-XF supports three different types of backcards:

- Half-height, 2-port OC-12 POS with hot-swappable Small Form-Factor Pluggable (SFP) modules to provide single-mode interfaces
- Half-height, 2-port Gigabit Ethernet backcard, with hot-swappable SFP modules to provide a variety of Ethernet physical interfaces
- Half-height user interface backcard with EIA/TIA-232 console and auxiliary ports with 2 RJ-45 Fast Ethernet ports for management purposes

The Cisco RPM-XF along with the Cisco IOS Software offers a feature-rich routing platform that provides network intelligence for business-critical solutions. The following tables provide product highlights addressing:

- Table 1: Key features
- Table 2: Front card technical specifications
- Table 3: Backcard technical specifications
- Table 4: Ordering information

**Table 1.** Key features of RPM-XF/Cisco IOS Software Operating System

Services	Features
<b>Routing</b>	<ul style="list-style-type: none"> <li>• Border Gateway Protocol Version 4 (BGPv4)</li> <li>• Multiprotocol BGP</li> <li>• Open Shortest Path First (OSPF)</li> <li>• Intermediate System-to-Intermediate System (IS-IS)</li> <li>• Routing Information Protocol Version 2 (RIPv2)</li> <li>• Enhanced Interior Gateway Routing Protocol (EIGRP)</li> <li>• IP multicast routing (Protocol Independent Multicast [PIM])</li> <li>• Bidirectional Forwarding Detection (BFD for OSPF)</li> </ul>
<b>MPLS</b>	<p>Switching</p> <ul style="list-style-type: none"> <li>• Label edge router (LER)</li> <li>• Label switch router (LSR)</li> <li>• MPLS class of service (CoS) over permanent virtual circuits (PVCs) with per-VC RED and per-VC WFQ</li> <li>• MPLS CoS over multiple label VC (LVC)</li> </ul> <p>MPLS-VPN</p> <ul style="list-style-type: none"> <li>• Multiprotocol BGP extensions</li> <li>• VPN "route-target" extended BGP community attributes</li> <li>• MPLS forwarding across backbone</li> <li>• Multiple routing/forwarding instances on the provider edge router</li> <li>• Multicast VPN</li> </ul> <p>MPLS-QoS</p> <ul style="list-style-type: none"> <li>• Multiple Label VCs per destination model</li> </ul>

Services	Features
<b>QoS</b>	<ul style="list-style-type: none"> <li>• IP Differentiated Services (Diff-Serv) (type of service [ToS])</li> <li>• Differentiated services code point (DSCP)</li> <li>• Classification/marketing</li> <li>• Committed access rate (CAR) verify</li> <li>• Congestion management: <ul style="list-style-type: none"> <li>◦ First in first out (FIFO) queuing</li> <li>◦ Priority queuing (PQ)</li> <li>◦ Weighted fair queuing (WFQ)/class-based WFQ (CBWFQ)</li> </ul> </li> <li>• Weighted random early detection (WRED)</li> <li>• Low-latency queuing (LLQ)</li> <li>• Weighted Random Early Detection (WRED)</li> </ul>
<b>Ethernet</b>	<ul style="list-style-type: none"> <li>• 802.1Q VLAN</li> <li>• Virtual Router Redundancy Protocol (VRRP)</li> <li>• Hot Standby Routing Protocol (HSRP)</li> <li>• Internet Routing and Birding (IRB)</li> </ul>
<b>High availability</b>	<ul style="list-style-type: none"> <li>• 1:N redundancy</li> <li>• Traffic Load Balancing</li> <li>• Support for online/offline diagnostics</li> <li>• Support for OAM generation when Gigabit Ethernet interfaces are down</li> </ul>
<b>ATM</b>	<ul style="list-style-type: none"> <li>• Real-time variable bit rate (VBR-rt)</li> <li>• Non-real time variable bit rate (VBR-nrt)</li> <li>• Unspecified bit rate (UBR)</li> <li>• Virtual-circuit shaping</li> <li>• Per-virtual circuit queues</li> <li>• Private Network-Network Interface (PNNI) soft permanent virtual circuit (SPVC), soft virtual circuit (SVC), soft permanent virtual path (SPVP)</li> <li>• Multiservice Switching Forum (MSF)-compliant architecture (Cisco Virtual Switch Architecture)</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• Support for SSHv2 for secure access</li> <li>• AAA</li> <li>• Control plane policing (COPP)</li> <li>• TACACS</li> <li>• RADIUS</li> </ul>
<b>Network management</b>	<ul style="list-style-type: none"> <li>• Simple Network Management Protocol Version 1, 2 and 3 (SNMPv1, SNMPv2, and SNMPv3) support</li> <li>• Cisco WAN Manager (element management, Layer 2 connection management GUI, SNMP)</li> <li>• Cisco IP Solution Center (MPLS VPN service management)</li> <li>• Cisco Information Center (CIC)</li> <li>• Cisco Transport Manager (CTM)</li> </ul>
<b>IETF standards compliance (not comprehensive)</b>	<ul style="list-style-type: none"> <li>• RFCs 3063, 3037, 3036, 3035, 3032, 3031, 2858, 2796, 2702, 2684, 2598, 2597, 2547, 2475, 2453, 2364, 2328, 2205, 1966, and 1583</li> </ul>

**Table 2.** Front Card Technical Specifications

Description	Specification
<b>Front card</b>	Cisco MGX-RPM-XF-512
<b>Card dimensions</b>	15.65 x 15.83 in. (full-height) (39.75 x 40.21 cm)
<b>Weight (front card and backcard)</b>	6.75 lb
<b>Mean time between failure (MTBF)</b>	>100,000 hr
<b>Operational temperature</b>	0° to 50°C (32° to 122°F)
<b>Processor</b>	400 MHz RM7000C RISC
<b>Processing performance</b>	More than 2.5 million pps IP routing
<b>Power</b>	48 VDC, 73W

Description	Specification
<b>MGX Platform controller</b>	PXM45
<b>Memory</b>	Up to 512 MB DRAM, up to 64 MB flash memory
<b>Backcards</b>	<ul style="list-style-type: none"> <li>RPM-XF User Interface Backcard</li> <li>2-port OC12 POS Backcard</li> <li>2-port Gigabit Ethernet Backcard</li> </ul>
<b>Electrical, safety, and standards compliance</b>	<ul style="list-style-type: none"> <li>EMI/ESD compliance</li> <li>FCC Part 15</li> <li>Bellcore GR1089-CORE</li> <li>IEC 801-2</li> <li>EN55022</li> <li>Safety compliance</li> <li>EN 60950</li> <li>UL 60950-1</li> <li>Bellcore Network Equipment Building Standards (NEBS): Level 3 compliant</li> </ul>
<b>Telcordia CLEI</b>	<ul style="list-style-type: none"> <li>GR-485-CORE – CLEI coding</li> <li>GR-383-CORE – CLEI code product label</li> <li>GR-209-CORE – PCN Process</li> </ul>

**Table 3.** Backcard Technical Specifications

	User Interface Card	2-Port OC-12 POS Intermediate-Reach Card	2-Port Gigabit Ethernet Card
<b>Card dimensions (H x W x D)</b>	7 x 1 x 4.5 in. (17.78 x 2.54 x 11.43 cm)	7 x 1 x 4.5 in. (17.78 x 2.54 x 11.43 cm)	7 x 1 x 4.5 in. (17.78 x 2.54 x 11.43 cm)
<b>Weight</b>	0.5 lb	0.8 lb	0.75 lb
<b>MTBF</b>	>100,000 hr	>100,000 hr	>100,000 hr
<b>Operational temperature</b>	0° to 50°C (32° to 122°F)	0° to 50°C (32° to 122°F)	0° to 50°C (32° to 122°F)
<b>Power</b>	3.3W	16.5W	14.3W
<b>Interface specifications</b>	<ul style="list-style-type: none"> <li>Console port: EIA/TIA-232 configuration port; synchronous interface speed based on configuration register up to 115,200 baud</li> <li>Auxiliary port: EIA/TIA-232 maintenance port; asynchronous interface speed configurable up to 115,200 baud</li> <li>RJ-45 Fast Ethernet ports: Maintenance port; supports two 10/100-Mbps full-duplex autosensing Ethernet ports</li> </ul>	<p>SFP POS OC12 Single Mode Intermediate Reach:</p> <ul style="list-style-type: none"> <li>Optical power budget: 12 db</li> <li>Transmit power: -15 to -8 dBm</li> <li>Receive power: -28 to -8 dBm</li> <li>Typical maximum distance: 9.3 miles (15 km)</li> </ul> <p>SFP POS OC12 Single Mode Long Reach:</p> <ul style="list-style-type: none"> <li>Optical power budget: 12 db</li> <li>Transmit power: -3 to 2 dBm</li> <li>Receive power: -28 to -8 dBm</li> <li>Typical maximum distance: 35.5 miles (40 km)</li> </ul>	<p>Optical power budget: 12 db</p> <p>1000BASE-SX SFP (multimode fiber):</p> <ul style="list-style-type: none"> <li>Power budget: 8.0 dB</li> <li>Transmit power: -4.5 dBm maximum to -9.0 dBm minimum</li> <li>Receive power: -17.0 dBm</li> </ul> <p>1000BASE-LX SFP (single-mode fiber):</p> <ul style="list-style-type: none"> <li>Power budget: 11.0 dB</li> <li>Transmit power: -3.5 dBm maximum to -9 dBm minimum</li> <li>Receive power: -20.0 dBm</li> </ul> <p>1000BASE-ZX SFP (single-mode fiber):</p> <ul style="list-style-type: none"> <li>Power budget: 20.0 dB</li> <li>Transmit power: +3.0 dBm maximum to -2.0 dBm minimum</li> <li>Receive power: -22.0 to 0 dBm</li> </ul> <p>1000BASE-T SFP Gige</p>

	User Interface Card	2-Port OC-12 POS Intermediate-Reach Card	2-Port Gigabit Ethernet Card
<b>Connector</b>	<ul style="list-style-type: none"> <li>• 2 RJ-45 Fast Ethernet connectors</li> <li>• EIA/TIA-232 console connector</li> <li>• EIA/TIA-232 auxiliary connector</li> </ul>	Dual LC/PC connector Optional SFPs: <ul style="list-style-type: none"> <li>• 622/STM4 Single Mode Intermediate Reach SONET with OC12/STM-4 HDLC Framing</li> <li>• 622/STM-4 Single Mode Long Reach SONET with OC12/STM-4 HDLC Framing</li> </ul>	Dual LC optical SFP: <ul style="list-style-type: none"> <li>• 1000BASE-SX SFP multimode, compliant with IEEE 802.3z specifications</li> <li>• 1000BASE-LX/LH SFP compliant with IEEE 802.3z specifications</li> <li>• 1000BASE-ZX SFP compliant with IEEE 802.3z specifications</li> </ul> RJ45 full-duplex Gigabit Ethernet SFP: <ul style="list-style-type: none"> <li>• 1000BASE-T compliant with IEEE 802.3:2000 specifications</li> </ul>
<b>Encapsulation</b>		<ul style="list-style-type: none"> <li>• IETF RFC 1619, Point-to-Point Protocol (PPP) over SONET</li> <li>• IETF RFC 1662, PPP in High-Level Data Link Control (HDLC)-like framing</li> <li>• IETF RFC 2615, PPP over SONET/SDH with 1 + 43 self-synchronous payload scrambling</li> </ul>	MAC with full-duplex operation and flow control Hardware address filtering on received frames of up to 4000 address entries 802.3x flow control Ethernet encapsulation formats: <ul style="list-style-type: none"> <li>• Ethernet Version 2</li> <li>• 802.2 Service Advertisement Protocol (SAP)</li> <li>• 802.2 Subnetwork Access Protocol (SNAP)</li> <li>• 802.1Q VLANs</li> </ul>
<b>Synchronization</b>		<ul style="list-style-type: none"> <li>• Local (internal) or loop timed (recovered from network)</li> <li>• 20-ppm clock accuracy</li> </ul>	
<b>Electrical, safety, and standards compliance</b>	<ul style="list-style-type: none"> <li>• EMI/ESD compliance               <ul style="list-style-type: none"> <li>◦ FCC Part 15</li> <li>◦ Bellcore GR1089-CORE</li> <li>◦ IEC 801-2</li> <li>◦ EN55022</li> </ul> </li> <li>• Safety compliance               <ul style="list-style-type: none"> <li>◦ EN 60950</li> <li>◦ UL 60950-1</li> </ul> </li> <li>• Bellcore NEBS: Level 3 compliant</li> <li>• Optical safety: IEC 60825-1 (Class 1)</li> </ul>		
<b>Telcordia CLEI</b>	<ul style="list-style-type: none"> <li>• GR-485-CORE – CLEI coding</li> <li>• GR-383-CORE – CLEI code product label</li> <li>• GR-209-CORE – PCN Process</li> </ul>		

**Table 4.** Ordering Information

Part Number	Part Description
MGX-RPM-XF-512	Route Processor Module-XF, 512 MB
MGX-2OC12POS	Half-height, OC-12 POS backcard for Cisco MGX 8800/8900 Series RPM-XF
MGX-2GE	Half-height, 2-port Gigabit Ethernet backcard for Cisco MGX 8800/8900 Series RPM-XF
MGX-XF-UI/B	User interface card model B for Cisco MGX 8800/8900 Series RPM-XF
SMFIR-622-SFP	OC-12, SFP, intermediate-reach
SMFLR-622-SFP	OC-12, SFP, long-reach
GLC-SX-MM	1000BASE-SX, SFP multimode
GLC-LH-MM	1000BASE-LHLX, SFP single-mode

Part Number	Part Description
GLC-ZX-SM	1000BASE-ZX, SFP single-mode
SFP-GE-T	1000BASE-T SFP (NEBS 3)

### For More Information

For more information about Cisco service and support programs and benefits, go to:

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