

## Aggregation Ethernet switches MES33xx

### Description:

MES33xx series switches can be used in service provider networks as aggregation or transport switches. They ensure high performance due to the interfaces operating at speeds of 10 Gbps or 1 Gbps. MES aggregation switches' feature set includes advanced L2 functions, static routing, dynamic routing, 4 SFP+ 10 Gbps interfaces, stacking of up to 8 devices, redundant and hot swappable power supplies. MES33xx switches comply with CE requirements.



### Features:

- Bandwidth up to 128 Gbps
- Non-blocking switching fabric
- 4 x 10G ports in basic configuration
- L3 functions
- Stacking up to 8 devices
- Hot-swappable redundant power supplies
- Dual ventilation system
- Front-to-Back cooling

### Specifications:

	MES3308F	MES3316F	MES3324F	MES3324
Packet processor	Marvel 98DX3336-A1 (PonCat3)			
<b>Interfaces</b>				
1000BASE-X /100BASE-FX (SFP)	4	12	20	-
10/100/1000BASE-T	-	-	-	20
10/100/1000BASE-T/ 1000BASE-X (SFP) / 100BASE-FX Combo	4			
10GBASE-R (SFP+)/1000BASE-X (SFP)	4			
10/100/1000BASE-T (OOB)	1			
Console port RS-232 (RJ-45)	1			
<b>Performance</b>				
Bandwidth	96 Gbps	112 Gbps	128 Gbps	
Throughput for 64 bytes <sup>1</sup>	71 MPPS		95 MPPS	
Buffer memory	1.5 MB			
RAM (DDR3)	512 MB			
ROM (RAW NAND)	512 MB			
MAC table	16K			
VLAN table	4 094			

L2 Multicast groups	4K
ARP table <sup>2</sup>	4 023
Link Aggregation Groups (LAG)	48, up to 8 ports per LAG
Maximum size of ECMP groups	8
Quality of Service (QoS)	8 egress queues per port
Number of ACL rules	3 006
L3 IPv4 Unicast <sup>3</sup>	12 866
L3 IPv6 Unicast <sup>3</sup>	3 222
L3 IPv4 Multicast (IGMP Proxy, PIM) <sup>3</sup>	4 024
L3 IPv6 Multicast (IGMP Proxy, PIM) <sup>3</sup>	1 006
Jumbo frames size	10 240 bytes
Stacking	8 devices

1 Values are given for 1-way transmission

2 For each host in the ARP table, an entry is created in the routing table

3 IPv4/IPv6 Unicast/Multicast routes share hardware resources

#### Interfaces functions

- Head-of-line blocking (HOL) prevention
- Back Pressure
- Auto MDI/MDIX
- Jumbo Frames
- Flow control (IEEE 802.3X)
- Port Mirroring
- Stacking

#### MAC table functions

- Independent learning mode per VLAN
- MAC Multicast Support
- Configurable aging time of MAC addresses
- Static MAC Entries
- MAC Flapping logging

#### VLAN functions

- Auto-Voice VLAN
- IEEE 802.1Q
- Q-in-Q
- Selective Q-in-Q
- GVRP

#### Service functions

- Virtual Cable Testing (VCT)
- Optical transceiver diagnostics
- Green Ethernet

#### Security functions

- DHCP Snooping
- DHCP Option 82
- IP Source Guard
- Dynamic ARP Inspection
- First Hop Security
- sFlow
- MAC-based authentication, Port Security, Static MAC entries
- Port-based authentication IEEE 802.1x
- Guest VLAN
- DoS attack prevention
- Traffic segmentation
- Protection against non-authorized DHCP servers
- DHCP clients filtering
- BPDU attacks prevention
- NetBIOS/NetBEUI filtering
- PPPoE Intermediate Agent

**L2 Multicast functions**

- Multicast profiles
- Static Multicast groups
- IGMP Snooping v1,2,3
- Port/host-based IGMP Snooping Fast Leave
- PIM-Snooping
- IGMP proxy-report
- IGMP authorization via RADIUS
- MLD Snooping v1,2
- IGMP Querier
- MVR

**L2 functions**

- STP (Spanning Tree Protocol, IEEE 802.1d)
- RSTP (Rapid Spanning Tree Protocol, IEEE 802.1w)
- MSTP (Multiple Spanning Tree Protocol, IEEE802.1s)
- STP Multiprocess
- PVSTP+
- RPVSTP+
- Spanning Tree Fast Link option
- STP Root Guard
- STP Loop Guard
- BPDU Filtering
- STP BPDU Guard
- VLAN-based Loopback Detection (LBD)
- ERPS (G.8032v2)
- Flex-link
- Private VLAN Trunk
- Layer 2 Protocol Tunneling (L2PT)

**L3 functions**

- Static IP routes
- Dynamic routing protocols RIPv2, OSPFv2, OSPFv3,
- IS-IS, BGP1
- Address Resolution Protocol (ARP)
- VRRP
- PIM SM, PIM DM, IGMP Proxy
- ECMP Load Balancing
- IP Unnumbered

**Link Aggregation functions**

- Static LAG
- Dynamic LAG (LACP)
- LAG Balancing Algorithm
- Multi-Switch Link Aggregation Group (MLAG)

<sup>1</sup> BGP protocol support is provided under license

**Main management functions**

- Download and upload of configuration file via TFTP
- Redirecting the output of CLI commands to an arbitrary file on ROM
- SNMP v1/v2c/v3
- Command Line Interface (CLI)
- Web interface
- Syslog
- SNTP (Simple Network Time Protocol)
- Traceroute
- LLDP (802.1ab) + LLDP MED
- Access control - privilege levels
- Management interface blocking
- Local authentication
- IP addresses filtering for SNMP
- RADIUS and TACACS+ (Terminal Access Controller Access Control System) clients
- Change of Authorization (CoA)
- SSH server, Telnet server
- SSH client, Telnet client
- Remote start of commands via SSH
- SSL
- Macrocommands
- CLI commands logging
- System log
- DHCP autoprovision
- DHCP Relay (Option 82)
- DHCP Option 12
- DHCPv6 Relay, DHCPv6 LDRA (Option 18, 37)
- PPPoE Circuit-ID tag
- Flash File System
- Debugging commands
- Rate limit of traffic to CPU
- Password encryption
- Password recovery
- Ping (IPv4/IPv6 support)
- DNS server

**Monitoring functions**

- Statistics on interfaces
- RMON/SMON
- IP SLA
- CPU utilization monitoring per tasks and per traffic type
- RAM utilization monitoring
- Temperature monitoring
- TCAM utilization monitoring

**Quality of Service (QoS)**

- QoS statistics
- Shaping, Policing
- IEEE 802.1p Class of Service (CoS)
- Storm Contro for different types of traffic (broadcast, multicast, unknown unicast)
- Bandwidth management
- Scheduling algorithms: Strict Priority/Weighted Round Robin (WRR)
- Three marking colors
- ACL-based CoS/DSCP assignment
- ACL-based VLAN assignment
- Setting the IEEE 802.1p priority for management VLAN
- DSCP to CoS/CoS to DSCP remarking
- 802.1p, DSCP mark assignment for IGMP

**OAM**

- IEEE 802.3ah Ethernet OAM
- Dying Gasp
- IEEE 802.1ag Connectivity Fault Management (CFM)
- IEEE 802.3ah Unidirectional Link Detection (UDLD)
- **ACL (Access Control Lists)**
- L2-L3-L4 ACL
- Time-Based ACL
- IPv6 ACL
- ACL based on:
- Physical port number
- IEEE 802.1p
- VLAN ID
- EtherType
- DSCP
- Protocol type
- TCP/UDP port number
- User Defined Bytes

**IPv6 functions**

- IPv6 Host
- Dual-stack

**MIB/IETF**

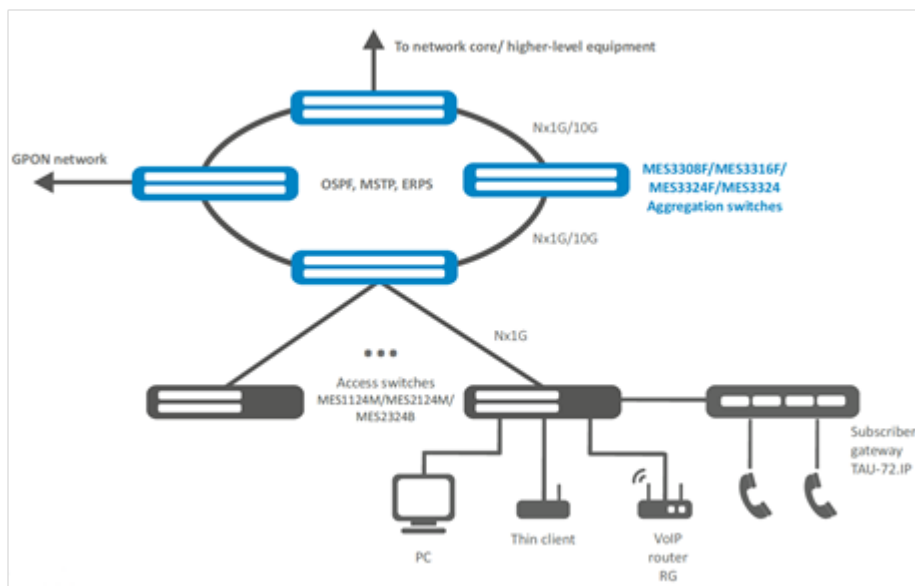
- RFC 1065, 1066, 1155, 1156, 2578 MIB Structure
- RFC 1212 Concise MIB Definitions
- RFC 1213 MIB II
- RFC 1215 MIB Traps Convention
- RFC 1493, 4188 Bridge MIB
- RFC 1157, 2571-2576 SNMP MIB
- RFC 1901-1908, 3418, 3636, 1442, 2578 SNMPv2 MIB
- RFC 1271, 1757, 2819 RMON MIB
- RFC 2465 IPv6 MIB
- RFC 2466 ICMPv6 MIB
- RFC 2737 Entity MIB
- RFC 4293 IPv6 SNMP Mgmt Interface MIB
- Private MIB
- RFC 3289 DIFFSERV MIB
- RFC 2021 RMONv2 MIB
- RFC 1398, 1643, 1650, 2358, 2665, 3635 Ether-like MIB
- RFC 2668 802.3 MAU MIB
- RFC 2674, 4363 802.1p MIB
- RFC 2233, 2863 IF MIB
- RFC 2618 RADIUS Authentication Client MIB
- RFC 4022 MIB for TCP
- RFC 4113 MIB for UDP
- RFC 3298 MIB for Diffserv
- RFC 2620 RADIUS Accounting Client MIB
- RFC 2925 Ping & Traceroute MIB
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMPv4
- RFC 2463, 4443 ICMPv6
- RFC 4884 Extended ICMP for Multi-Part messages support
- RFC 793 TCP
- RFC 2474, 3260 DS field in the IPv4 and IPv6 header
- RFC 1321, 2284, 2865, 3580, 3748 Extensible Authentication Protocol (EAP)
- RFC 2571, RFC2572, RFC2573, RFC2574 SNMP
- RFC 826 ARP
- RFC 854 Telnet



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	MES3308F	MES3316F	MES3324F	MES3324
Maximum power Consumption	25 W	35 W	45 W	35 W
Power supply	100 - 240 V AC, 50 - 60 Hz; 36 - 72 V DC			
Input current	0.25-0.1 A for AC 0.69-0.35 A for DC	0.35-0.15 A for AC 0.97-0.49 A for DC	0.45-0.19 A for AC 1.25-0.62 A for DC	0.35-0.15 A for AC 0.97-0.49 A for DC
Operating temperature	from -10 to +45° C			
Storage temperature	from -50 to +70° C			
Operating humidity	no more than 80%			
Cooling	Front-to-Back 2 fans	Front-to-Back 3 fans	Front-to-Back 4 fans	Front-to-Back 4 fans
From factor	19", 1U			
Dimensions (W x H x D)	430 x 44 x275 mm			
Weight	3.15 kg	3.25 kg	3.50 kg	3.25 kg

### Application diagram:



### Ordering code:

Name	Description
MES3308F-XX1-XX2	MES3308F Ethernet switch, 1 port of 10/100/1000BASE-T (OOB), 4 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASEX/100BASE-FX, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), L3
MES3316F-XX1-XX2	MES3316F Ethernet switch, 1 port of 10/100/1000BASE-T (OOB), 12 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASEX/100BASE-FX, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), L3
MES3324F-XX1-XX2	MES3324F Ethernet switch, 1 port of 10/100/1000BASE-T (OOB), 20 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASEX/100BASE-FX, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), L3
MES3324-XX1-XX2	MES3324 Ethernet switch, 1 port of 10/100/1000BASE-T (OOB), 20 ports of 10/100/1000BASE-T, 4 Combo ports of 10/100/1000BASE-T/1000BASEX/ 100BASE-FX, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), L3

### Related products

PM160-220/12      PM160-220/12 power module, 220V AC, 160W



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PM100-48/12

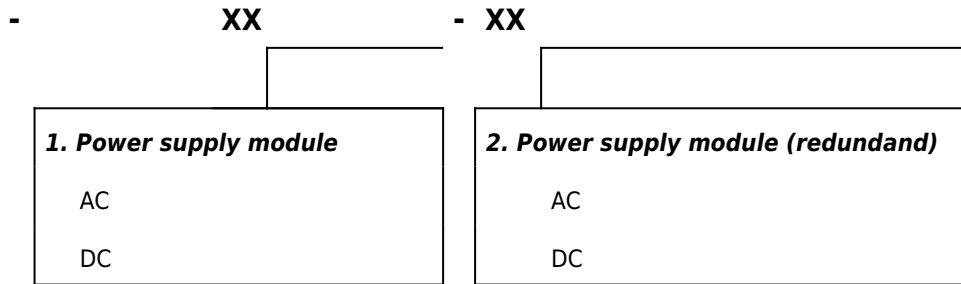
PM100-48/12 power module, 48V DC, 100W

### Related software

EMS-MES-aggregation

EMS-MES-aggregation option of EMS system for managing and monitoring of OPTOKON network elements: 1 MES-aggregation network element.

**MES33xxx**



**Note:** The switch must be equipped at least with one power supply module

### Example of Orderig code

**MES3324-AC**            The switch MES3324 with one power supply module PM160-220/12

**MES3324-DC**            The switch MES3324 with one power supply module PM100-48/12

**MES3324-AC-AC**        The switch MES3324 with two power supply modules PM160-220/12

**MES3324-AC-DC**        The switch MES3324 with first power supply module PM160-220/12 and second power supply module PM100-48/12