# Cisco ME 3800X Series Carrier Ethernet Switch Router

You're looking for high service scale but also lower power consumption in a highly affordable 1-rack-unit (1RU) switch router optimized for small aggregation and remote point-of-presence (POP) applications. And you've found it in the Cisco® ME 3800X Series Carrier Ethernet Switch Router. This converged, full-featured aggregation platform is purpose built for mobile, business, and residential markets. The Cisco ME 3800X Series is part of the Cisco Carrier Ethernet aggregation portfolio and complements the Cisco 7600 Series Routers and Cisco ASR 9000 Series Routers with a rich and scalable feature set of Layer 2 and Layer 3 VPN services in a compact package.

The Cisco ME 3800X Series (Figure 1) is a small footprint fixed-form-factor platform that comes in the following configuration:

- Cisco ME 3800X-24FS-M with 24 Gigabit Ethernet SFP ports and two 10 Gigabit Ethernet SFP+ ports

**Figure 1.** Cisco ME 3800X Series Carrier Ethernet Switch Router

## Key Applications

### Broadband Aggregation

The Cisco ME 3800X Series supports broadband aggregation for delivering "any-play" services (voice, video, data, and mobility). Designed to support thousands of subscribers with a high level of quality of service (QoS), the Cisco ME 3800X Series is capable of scaling to 32,000 queues per device. This high degree of scalability combined with a more granular QoS algorithm (three-level hierarchical QoS) results in a greatly enhanced broadband user experience. This feature-rich Layer 2 and Layer 3 switch router supports a variety of broadband applications including IPTV and video on demand (VoD), enhancing and extending the Cisco Evolved Programmable Network architecture.

### Pre-Aggregation for Mobile Applications

Deployed as a pre-aggregation platform for mobile backhaul, the Cisco ME 3800X Series can aggregate Cisco MWR 2941-DC Mobile Wireless Routers and use Multiprotocol Label Switching (MPLS) as a transport for Radio Access Network (RAN) backhaul traffic. It offers timing services, allowing for mobile clocking synchronization from the core of the network to the RAN. The Cisco ME 3800X Series can receive clocking information into its Building Integrated Timing Supply (BITS) interface. It supports synchronous Ethernet (SynchE) with Ethernet Synchronization Messaging Channel (ESMC) to allow best clock source traceability.

### Metro Ethernet Aggregation

The Cisco ME 3800X Series is built to meet service provider requirements for Metro Ethernet aggregation. It is optimized for remote central office (CO) and smaller aggregation sites where a fully featured, small-footprint aggregation platform is needed. The Cisco ME 3800X Series offers service flexibility and delivers Layer 2, IP, and MPLS transport for advanced Layer 2 and Layer 3 VPN and multicast services.

## Key Differentiators

### Cisco Carrier Ethernet ASIC

Powered by Cisco's Carrier Ethernet ASIC, designed specifically for the needs of service providers, the Cisco ME 3800X Series delivers essential Carrier Ethernet technologies including: Hierarchical QoS (H-QoS), MPLS, and Virtual Private LAN Services (VPLS). The ASIC provides line-rate performance and supports advanced services including access control list (ACL) and H-QoS without impacting performance. It incorporates innovative traffic management capabilities while providing intelligent packet switching and routing operations.

### Service Richness

With the Cisco ME 3800X Series, each service is assigned enhanced QoS and security attributes. The Cisco ME 3800X Series accomplishes advanced per-traffic-class metering and offers bidirectional packets and bytes statistics. The service offering is enhanced with rich operations, administration, and management (OAM) functionality including: Layer 2 Connectivity Fault Management (CFM), IP SLA for Layer 3, and MPLS OAM.

### Service Scale

The Cisco ME 3800X Series delivers unmatched service scalability in a 1RU footprint. With support for 256,000 MAC addresses and 8000 bridge domains, this switch router delivers high performance and high scale for point-to-point and multipoint VPN services. A total buffer size of 352 MB is available to provide per-service advanced QoS capabilities. Such an amount of buffer is required when stringent applications like financial services or video must be protected against the impact of a 10 Gbps to 1 Gbps speed mismatch. The quantity of statistical counters allows the Cisco ME 3800X Series to provide a high level of service metering and monitoring throughout its range of scale.

### High-Performance Hardware

The Cisco ME 3800X Series provides two slots for hot-swappable and redundant power supply. Three fans are integrated into each power supply, providing fan redundancy. High availability is also achieved on the Cisco ME 3800X Series through proactive diagnostic tools including Generic On-Line Diagnostics (GOLD) and Onboard Failure Logging (OBFL). These tools help service providers avoid potential problems before they occur - and troubleshoot and diagnose once identified.

Table 1 lists the hardware parts available for Cisco ME 3800X Series.

**Table 1.** Hardware Components for Cisco ME 3800X Series

| Part Number | Description |
|---|---|
| **ME-3800X-24FS-M** | Cisco ME 3800X-24FS Ethernet Carrier Ethernet Switch Router |
| **ME-3800X-24FS-M=** | Spare Cisco ME 3800X-24FS Ethernet Carrier Ethernet Switch Router |
| **PWR-ME3KX-AC** | Cisco ME 3600X/ME 3800X Series field- replaceable AC power supply and fan module |
| **PWR-ME3KX-DC** | Cisco ME 3600X/ME 3800X Series field- replaceable DC power supply and fan module |
| **PWR-ME3KX-AC=** | Cisco ME 3600X/ME 3800X Series spare field-replaceable AC power supply and fan module |
| **PWR-ME3KX-DC=** | Cisco ME 3600X/ME 3800X Series spare field-replaceable DC power supply and fan module |

| Part Number | Description |
|---|---|
| **ME-FANTRAY=** | Cisco ME 3600X/ME 3800X Series spare fan tray. The fan tray is required in the second slot when only one power supply is in the system. |
| **RCKMNT-ME3KX-ETSI** | ETSI Rack mount Option for the Cisco ME 3600X/ME 3800X Series |
| **RCKMNT-ME3KX-23IN** | 23” Rack mount Option for Cisco ME 3600X//ME 3800X Series |
| **RCKMNT-ME3KX-ANG** | Angled Rack mount for Cisco ME 3600X/ME 3800X Series |
| **RCKMNT-ME3KX-ETSI=** | Spare ETSI Rack mount Option for the Cisco ME 3600X/ME 3800X Series |
| **RCKMNT-ME3KX-23IN=** | Spare 23” Rack mount Option for Cisco ME 3600X//ME 3800X Series |
| **RCKMNT-ME3KX-ANG=** | Spare Angled Rack mount for Cisco ME 3600X/ME 3800X Series |
| **RCKMNT-ME3KX-19IN=** | Spare 19” Rack mount Option for Cisco ME 3600X//ME 3800X Series |
| **MEM-ME3K-2GB** | Cisco ME 3600X and ME3800X SD Memory Card 2GB |
| **MEM-ME3K-2GB=** | Cisco ME 3600X and ME3800X SD Memory Card 2GB Spare |
| **MEM-ME3K-4GB** | Cisco ME 3600X and ME3800X SD Memory Card 4GB |
| **MEM-ME3K-4GB=** | Cisco ME 3600X and ME3800X SD Memory Card 4GB Spare |

The Cisco ME 3800X Series supports a wide range of small form factor pluggable (SFP) and SPF+ optic modules. Table 2 lists their part numbers.

**Table 2.** SFP and SFP+ Modules Supported with Cisco ME 3800X Series

| | Part Number |
|---|---|
| **SFP** | GLC-FE-100FX, GLC-FE-100EX, GLC-FE-100ZX, GLC-FE-100LX, GLC-FE-100BX-U, GLC-FE-100BX-D, GLC-LH-SM, GLC-SX-MM, GLC-ZX-SM, GLC-SX-MMD, GLC-LH-SMD, GLC-EX-SMD, GLC-T, GLC-BX-U (CPN 10-2094-02), GLC-BX-D (CPN 10-2093-02), GLC-BX40-U-I, GLC-BX40-D-I, GLC-BX40-DA-I, GLC-BX80-U-I, GLC-BX80-D-I,, SFP-GE-L, SFP-GE-S, SFP-GE-T, CAB-SFP-50CM, CWDM-SFP-1470, CWDM-SFP-1490, CWDM-SFP-1510, CWDM-SFP-1530, CWDM-SFP-1550, CWDM-SFP-1570, CWDM-SFP-1590, CWDM-SFP-1610, DWDM-SFP-6061, DWDM-SFP-5979, DWDM-SFP-5898, DWDM-SFP-5817, DWDM-SFP-5736, DWDM-SFP-5655, DWDM-SFP-5575, DWDM-SFP-5413, DWDM-SFP-5494, DWDM-SFP-5332, DWDM-SFP-5252, DWDM-SFP-5172, DWDM-SFP-5092, DWDM-SFP-5012, DWDM-SFP-4931, DWDM-SFP-4851, DWDM-SFP-4772, DWDM-SFP-4692, DWDM-SFP-4612, DWDM-SFP-4532, DWDM-SFP-4453, DWDM-SFP-4373, DWDM-SFP-4294, DWDM-SFP-4214, DWDM-SFP-4134, DWDM-SFP-4056, DWDM-SFP-3977, DWDM-SFP-3898, DWDM-SFP-3819, DWDM-SFP-3739, DWDM-SFP-3661, DWDM-SFP-3582, DWDM-SFP-3504, DWDM-SFP-3425, DWDM-SFP-3346, DWDM-SFP-3268, DWDM-SFP-3190, DWDM-SFP-3112, DWDM-SFP-3033, DWDM-SFP-6141 |
| **SFP+** | SFP-10G-SR, SFP-10G-LR, SFP-10G-ER, SFP-10G-ZR, SFP-10G-LRM, SFP-H10GB-CUxM, SFP-10G-BXD-I, SFP-10G-BXU-I, SFP-10G-BX40D-I, SFP-10G-BX40U-I, DWDM-SFP10G-61.41, DWDM-SFP10G-60.61, DWDM-SFP10G-59.79, DWDM-SFP10G-58.98, DWDM-SFP10G-58.17, DWDM-SFP10G-57.36, DWDM-SFP10G-56.55, DWDM-SFP10G-55.75, DWDM-SFP10G-54.94, DWDM-SFP10G-54.13, DWDM-SFP10G-53.33, DWDM-SFP10G-52.52, DWDM-SFP10G-51.72, DWDM-SFP10G-50.92, DWDM-SFP10G-50.12, DWDM-SFP10G-49.32, DWDM-SFP10G-48.51, DWDM-SFP10G-47.72, DWDM-SFP10G-46.92, DWDM-SFP10G-46.12, DWDM-SFP10G-45.32, DWDM-SFP10G-44.53, DWDM-SFP10G-43.73, DWDM-SFP10G-42.94, DWDM-SFP10G-42.14, DWDM-SFP10G-41.35, DWDM-SFP10G-40.56, DWDM-SFP10G-39.77, DWDM-SFP10G-38.98, DWDM-SFP10G-38.19, DWDM-SFP10G-37.40, DWDM-SFP10G-36.61, DWDM-SFP10G-35.82, DWDM-SFP10G-35.04, DWDM-SFP10G-34.25, DWDM-SFP10G-33.47, DWDM-SFP10G-32.68, DWDM-SFP10G-31.90, DWDM-SFP10G-31.12, DWDM-SFP10G-30.33 |

## Flexible Software Options

The Cisco ME 3800X Series supports the Cisco IOS® Software Activation feature. With this feature Cisco IOS Software feature sets can be activated by Cisco software licenses, allowing a “pay as services grow” model. This model lets service providers invest in software resources only when their business needs it. The Cisco ME3800X Series offers four different Cisco IOS Software licenses:

- The **Metro Ethernet Services** license offers advanced QoS, Carrier Ethernet Layer 2 features, and Ethernet OAM capability.
- The **Metro IP Services** license offers advanced QoS, Carrier Ethernet Layer 2 features, Ethernet OAM, Layer 3 features for advanced IP routing protocols, multi-VPN routing, and Forwarding Customer Edge (multi-VRF CE) capabilities.

- The **Metro Aggregation Services** license adds the following capabilities to the METRO IP ACCESS image: MPLS, EoMPLS pseudowires, VPLS, MPLS traffic engineering, Fast Reroute, and MPLS VPN support.
- The **Services Scalability** license allows full scalability for Layer 2, IP routing, MPLS resources, and the use of Switch Management Database (SDM) templates.

Table 3 lists the key feature in the Cisco IOS licenses for the Cisco ME 3800X Series.

**Table 3.** Feature Set in Cisco ME 3800X Series Licenses

| Metro Ethernet Services | Metro IP Services | Metro Aggregation Services |
|---|---|---|
| Layer 2: 802.1d, 802.1q | All features in METROETHSERVICES plus: | All features in: METROAGGRSERVICES plus: |
| Ethernet Virtual Circuit (EVC) | IP routing (RIP, OSPF, EIGRP, IS-IS, BGP) | MPLS |
| Ethernet OAM (802.1ag, 802.3ah, E-LMI, 1731 PM) | PIM (SM, DM, SSM), SSM mapping | MPLS traffic engineering (TE) and Fast Reroute (FRR) |
| MST, REP, Flexlink, G.8032 | Bidirectional Forwarding Detection (BFD) | MPLS OAM |
| Synchronous Ethernet, Ethernet Synchronization messaging Channel (ESMC) Synchronization Status Messages (SSM) | Multi-VRF CE (VRF lite) with service awareness (ARP, ping, SNMP, syslog, traceroute, FTP, TFTP) | MPLS VPN |
| | | Multicast VPN (MVPN) |
| | | Ethernet over MPLS (EoMPLS) |
| | | Virtual Private LAN Services (VPLS), Hierarchical VPLS (H-VPLS) |
| | | Pseudowire redundancy |
| | | Switch Database Management (SDM) templates (with the Scalability license only) |

Table 4 provides brief descriptions of the Cisco ME 3800X Series software options.

**Table 4.** Cisco ME 3800X Series Software Options

| Part Number | Product Name |
|---|---|
| **License Options** | |
| **ME3800X-E** | Cisco ME3800X METRO ETHERNET SERVICES Software Paper License |
| **ME3800X-I** | Cisco ME 3800X Series METRO IP SERVICES Software Paper License |
| **ME3800X-A** | Cisco ME 3800X Series METRO AGGREGATION SERVICES Software Paper License |
| **ME3800X-S** | Cisco ME 3800X Series SCALED Software Paper License |
| **Product Activation Keys** | |
| **ME3800X-LIC=** | Product activation keys for ME3800X Series (Paper Delivery) |
| **L-ME3800X-LIC=** | Product activation keys for ME3800X Series (E-Delivery) |
| **License Upgrade Options** | |
| **ME3800X-I-A** | Cisco ME 3800X Series METRO IP2 AGGREGATION SERVICES Software Paper License |
| **L-ME3800X-I** | Cisco ME 3800X Series METRO IP SERVICES Software E License |
| **L-ME3800X-A** | Cisco ME 3800X Series METRO AGGREGATION SERVICES Software E License |
| **L-ME3800X-I-A** | Cisco ME 3800X Series METRO IP2 AGGREGATION SERVICES Software E License |
| **L-ME3800X-S** | Cisco ME 3800X Series SCALED Software E License |
| **Software Options** | |
| **S380XVK9T-15303S** | Cisco ME 380X SERIES IOS UNIVERSAL TAR - Release 15.3(3)S |
| **S380XVT-15303S** | Cisco ME 380X SERIES IOS UNIVERSAL W/O CRYPTO TAR - Release 15.3(3)S |
| **S380XVK9T-15403S** | Cisco ME 380X SERIES IOS UNIVERSAL TAR - Release 15.4(3)S |
| **S380XVT-15403S** | Cisco ME 380X SERIES IOS UNIVERSAL W/O CRYPTO TAR - Release 15.4(3)S |
| **S380XVK9T-15501S** | Cisco ME 380X SERIES IOS UNIVERSAL TAR - Release 15.5(1)S |
| **S380XVT-15501S** | Cisco ME 380X SERIES IOS UNIVERSAL W/O CRYPTO TAR - Release 15.5(1)S |

## Key Features

Table 5 lists the features of the Cisco ME 3800X Series.

**Table 5.** Features

| Features |
| --- |
| **Ethernet Services** |
| • Ethernet Virtual Connections (EVCs) for:<br>◦ QinQ<br>◦ Selective QinQ<br>◦ Inner and Outer VLAN classification<br>◦ EVC Push and Pop rewrite<br>◦ EVC local connect<br>• IEEE bridging<br>• Layer 2 Protocol Tunneling (L2PT)<br>• Hierarchical VPLS (H-VPLS), Virtual Private LAN Service (VPLS), VPLS Border Gateway Protocol [BGP] signaling<br>• Virtual Private Wire Service (VPWS), Ethernet over MPLS (EoMPLS), pseudowire redundancy<br>• VPLS over remote Loop Free Alternate (LFA)<br>• Ethernet Data Plane loopback (Terminal and Facility)<br>• IEEE 802.1ad Provider Bridge<br>• IEEE 8021.ad on EFP xconnect |
| **Layer 3 Services** |
| • Layer 3 Routing<br>• IPv4 Routing (Border Gateway Protocol [BGP], Intermediate System-to-Intermediate System [IS-IS], and Open Shortest Path First [OSPF]), Hot Standby Router Protocol version 1 and 2 (HSRPv1, HSRPv2), Virtual Router Redundancy Protocol (VRRP)<br>• IPv6 Unicast Routing (Border Gateway Protocol [BGP], Intermediate System-to-Intermediate System [IS-IS], and Open Shortest Path First [OSPF])<br>• OSPF for IPv6 (OSPFv3)<br>• IPv6 Provider Edge (6PE)<br>• IPv6 VPN over MPLS (6VPE)<br>• IPv6 HSRP<br>• RIPNG<br>• VRRPv3<br>• MPLS<br>• Label Distribution Protocol (LDP), Targeted LDP (T-LDP), Resource Reservation Protocol (RSVP), Differentiated Services (DiffServ)-aware traffic engineering, MPLS L3VPN<br>• MPLS traffic engineering (including TE-FRR)<br>• Carrier Supporting Carrier (CsC) with BGP as CE-PE routing protocol<br>• BGP with label distribution (RFC3107)<br>• Routed Pseudowire<br>• Integrated Routing and Bridging (IRB)<br>• Policy Based Routing (PBR)<br>• Auto-IP<br>• IPSLA<br>• IPSLA TWAMP responder v1.0 and compliant to RFC5357 |
| **QoS** |
| • Up to 32,000 egress queues per system<br>• Class-Based Weighted Fair Queuing (CBWFQ)<br>• Priority Queuing<br>• 2-rate 3-color (2R3C) ingress Policing, Egress Policing (1R2C) for LLQ<br>• Ingress and Egress marking (CoS, DSCP, MPLS Experimental Bits)<br>• Egress shaping per port and per queue<br>• Modular QoS CLI (MQC)<br>• 3-level H-QoS<br>• Classification based on inner and outer class of service (CoS) or VLAN ID |

| Features |
| --- |
| • Copy inner to outer CoS<br>• WRED<br>• IPV6 QoS<br>• Table Map<br>• QoS on Etherchannels<br>• QoS support with EVC push<br>• QoS IPv4 and IPv6 ACL |
| **Multicast** |
| • IPv4 Multicast<br>• Protocol Independent Multicast sparse mode (PIM-SM), PIM Source Specific Multicast (PIM SSM), PIM SSM mapping<br>• Internet Group Management Protocol Versions 1, 2, and 3 (IGMPv1, v2, and v3)<br>• IGMPv1, v2, and v3 snooping on switchport, EVC interfaces and Pseudowires<br>• PIM Snooping<br>• IPv4 multicast per VRF lite<br>• Multicast VPN (MVPN) |
| **Security** |
| • Authentication, authorization, and accounting (AAA); TACACS+; Secure Shell (SSH) Protocol; MAC limiting per Ethernet flow point (EFP) or bridge domain; unicast, multicast, and broadcast storm control blocking on any interface or port<br>• Layer 2 ACLs<br>• Layer 3 ACLs for IPv4 and IPv6<br>• ACL on switchport, EVC and routed interfaces<br>• Control Plane Policing<br>• DHCP snooping with option 82<br>• Dynamic Arp Inspection (DAI)<br>• SPAN<br>• 802.1x Authenticator |
| **Availability** |
| • Resilient Ethernet Protocol (REP)<br>• REP Access gateway Enhancements<br>• ITU-T G.8032 Ethernet Ring Protection Switching<br>• IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)<br>• IEEE 802.1s Multiple Spanning Tree Protocol (MST)<br>• Per-VLAN Rapid Spanning Tree (PVRST+)<br>• Flexlink<br>• MPLS TE Fast Reroute<br>• BFD triggered Fast Reroute<br>• BFD multi-hop<br>• BFD for Static,ISIS, OSPF, BGP<br>• BFD over Switched Virtual Interface (SVI)<br>• 802.3ad Link Aggregation Bundles<br>• MPLS IGP-LDP Synchronization<br>• LACP 1-1 redundancy with Fast Switchover<br>• EoMPLS Link Path Through<br>• Multi-chassis LACP (mLACP) |
| **OAM** |
| • CFM (802.1ag)<br>• Link OAM (802.3ah)<br>• MPLS OAM<br>• E-LMI (CE and PE)<br>• 1731 Performance Monitoring (ETH-DM, ETH-SLM) with concurrent and on demand operations |

| Features |
|---|
| **Manageability** |
| • Simple Network Management Protocol (SNMP)<br>• MIBs<br>• RMON<br>• Cisco Active Network Abstraction (ANA) 3.7.1: physical and logical inventory, service-level views with support for the following technologies: OSPF, BGP, EtherChannel, routing, Link Aggregation Group (LAG), ACL, Cisco Discovery Protocol, Address Resolution Protocol (ARP)<br>• CiscoWorks Lan Management Solution (LMS) 3.2<br>• Embedded Event Manager (EEM 4.0)<br>• 60 days build-in evaluation licenses<br>• Switch Database Management (SDM)<br>• External SD Flash Cards support<br>• Autonomic Networking (AN) |
| **Timing** |
| • ITU-T Synchronous Ethernet (syncE) with Ethernet Synchronization Messaging Channel (ESMC)<br>• Synchronization Status Messages (SSM) |

## Product Specifications

Tables 6 through 8 list product, power, and environmental specifications for the Cisco ME 3800X Series. Table 9 lists standards and protocols, and Table 10 gives safety and compliance information.

**Table 6.** Product Specifications

| Description | Cisco ME 3800X-24FS |
|---|---|
| **Performance** | Forwarding bandwidth full duplex: Cisco ME 3800X-24FS AC or DC: 44 Gbps<br>Forwarding rate: Cisco ME 3800X-24FS AC or DC: 65 Mpps<br>Configurable maximum transmission unit (MTU) of up to 9,800 bytes, for bridging on Gigabit and 10 Gigabit |
| **Memory** | DRAM: 1GB<br>Flash: 64MB<br>Packet buffer: 352MB<br>External SD Flash: 2GB and 4GB SD Flash cards (optional) |
| **Connectors and cabling** | **SFP ports:**<br>• 10/100/1000BASE-T SFP-based ports: RJ-45 connectors, 4-pair Category 5 UTP cabling<br>• 100BASE-FX and -LX: Duplex LC receptacle fiber connectors (multimode and single-mode)<br>• 100BASE-BX: Single-fiber LC receptacle connector (single-mode fiber)<br>• 100BASE-EX: SFP module for 100 Mb port, 1310 nm wavelength, 40 km over single-mode fiber<br>• 100BASE-ZX: SFP module for 100 Mb port, 1550 nm wavelength, 80 km over single-mode fiber<br>• 1000BASE-BX: Single-fiber LC receptacle connector (single-mode fiber)<br>• 1000BASE-SX, -LX/LH, -EX and -ZX and CWDM and DWDM: Duplex LC receptacle fiber connectors (multimode and single-mode fiber)<br>**SFP+ port:**<br>• 10GBASE-LR, -SR, -ER, -ZR, -LRM, DWDM and -H10GB-CUxM where x = 1, 3, 5 meters<br>• SFP+ port supports 1000BASE-X except 1000BASE-T<br>Management console port: RJ-45-to-DB9 cable for PC connections<br>Management 10/100/1000 Ethernet: RJ-45 connector<br>BITS and alarm ports: RJ-45 connector |
| **Indicators** | Per-port status LEDs: Link integrity, port disabled, and activity indications<br>Power input/output status LED<br>Alarm status LED<br>SynchE status LED<br>System status LED |
| **Dimensions** | All SKUs 1.72-in. x 17.50-in. x 20.33-in. (H x W x D) |

| Description | Cisco ME 3800X-24FS |
|---|---|
| **Weight** | ME-3800X-24FS-M 14.50 lb (6.57 kg)<br>PWR-ME3KX-AC 2.90 lb (1.31 kg)<br>PWR-ME3KX-DC 3.10 lb (1.40 kg)<br>ME-FANTRAY 1.65 lb (0.74 kg) |
| **Mean time between failure (MTBF)** | ME3800X-24FS-M: 185,349 hours<br>PWR-ME3KX-DC: 319,000 hours (48V input at 40ºC)<br>PWR-ME3KX-AC: 328,000 hours (120V at 40ºC), 342,000 hours (230V at 40ºC)<br>ME-FANTRAY: 2,177,000 hours (12V input at 40ºC) |

**Table 7.** Power Specifications

| Description | Cisco ME 3800X-24FS |
|---|---|
| **Power consumption** | Cisco ME 3800X-24FS-M, one AC and one FT:<br>155W (typical), 228W (maximum), 530 Btus per hour (typical), 779 Btus per hour (maximum)<br>Cisco ME 3800X-24FS-M, two AC:<br>163W (typical), 233W (maximum), 557 Btus per hour (typical), 796 Btus per hour (maximum)<br>Cisco ME 3800X-24FS-M, one DC and one FT:<br>156W (typical), 246W (maximum), 533 Btus per hour (typical), 840 Btus per hour (maximum)<br>Cisco ME 3800X-24FS-M, two DC:<br>161W (typical), 238W (maximum), 550 Btus per hour (typical), 813 Btus per hour (maximum) |
| **AC input voltage and frequency** | 100-240VAC, 50-60Hz |
| **DC input voltages** | 18V to 32VDC, 36V to 72VDC |

**Table 8.** Environmental Specifications

| Cisco ME 3800X Series Environment Specification (NEBS) | |
|---|---|
| **Operating environment and altitude**[1] | Normal operating temperature and altitudes:<br>0 to +50ºC, up to 1000 feet (300m)<br>0 to +45ºC, up to 6000 feet (1800m)<br>0 to +40ºC, up to 10,000 feet (3000m)<br>Short-term[2] exceptional conditions:<br>0 to +60ºC, up to 1000 feet (300m)<br>0 to +55ºC, up to 6000 feet (1800m)<br>0 to +50ºC, up to 10,000 feet (3000m)<br>0 to +45ºC, at sea level with single fan failure |
| **Relative humidity**[3] | 5% to 95%, non-condensing |
| **Acoustic noise**[4] | LpA: 43 dB typical, 45 dB maximum<br>LwA: 5.4 Bel typical, 5.6 Bel maximum |
| **Storage environment** | Temperature: -25 to +70ºC altitude: 15,000 ft |

[1] Switch supports -5°C operation provided that it powers up at ambient equal to or greater than 0°C. SFP-10G-LRM SFP+ module may only be used from 0°C. GLC-T SFP may only be used from 0 to +50°C, up to 1000 feet (300m), for normal operating and short-term conditions
[2] Not more than the following in a one-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences
[3] This may be limited by specification of optical modules
[4] Acoustic noise is measured per ISO 7779 and declared per ISO 9296

**Table 9.** Standards and Protocols

| Standards and Protocols | |
|---|---|
| • IEEE 802.1s<br>• IEEE 802.1w<br>• IEEE 802.3ad<br>• IEEE 802.3ah<br>• IEEE 802.1ag | • IEEE 802.1Q VLAN<br>• IEEE 802.3 10BASE-T<br>• IEEE 802.3u 100BASE-T<br>• IEEE 802.3ab 1000BASE-T<br>• IEEE 802.3z 1000BASE-X |

| Standards and Protocols | |
|---|---|
| • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports<br>• IEEE 802.1D Spanning Tree Protocol<br>• IEEE 802.1p CoS classification | • BFD for OSPF, IS-IS, BGP, HSRP, EIGRP<br>• IP routing: Static, RIP versions 1 and 2, EIGRP, OSPF, BGPv4, PIM-SM, and PIM-DM (metro IP access only)<br>• Management: SNMP versions 1, 2, and 3<br>• MEF 9 & 14 certified<br>• MEF CE 2.0 certified (E-LINE, E-LAN, E-TREE) |

**Table 10.** Safety and Compliance

| Type | Standards |
|---|---|
| **Electromagnetic** | FCC Part 15 Class |
| **Emissions Compliance** | • EN 55022 Class A (CISPR22 Class A)<br>• EN 55024<br>• EN 300 386<br>• VCCI Class A<br>• AS/NZS 3548 Class A or AS/NZS CISPR22 Class A<br>• KCC<br>• CE Marking |
| **Safety** | • UL 60950-1<br>• UL to CAN/CSA 22.2 No.60950-1<br>• TUV/GS to EN 60950-1 with all Amendments<br>• CB to IEC 60950-1 with all country deviations<br>• NOM to NOM-019-SCFI (through distributors)<br>• CE Marking<br>• CCC |
| **NEBS** | GR-63-CORE, GR-1089-CORE - Level 3, Type 2<br>Verizon's FOC Certification on optical SFPs |
| **ETSI** | EN 300 019 - Storage: Class 1.2, Transportation: Class 2.3, In-Use: Class 3.2 |

## Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, promoting high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, refer to Cisco Technical Support Services or Cisco Advanced Services.

Cisco is committed to reducing your total cost of ownership. Cisco offers a portfolio of technical support services to help ensure that Cisco products operate efficiently, remain highly available, and benefit from the most up-to-date system software. The services and support programs described in Table 11 are available as part of the Cisco Carrier Ethernet Switching Service and Support solution and are available directly from Cisco and through resellers.

**Table 11.** Service and Support

| Advanced Services | Features | Benefits |
|---|---|---|
| **Cisco Total Implementation Solutions (TIS), available directly from Cisco**<br>**Cisco Packaged TIS, available through resellers** | • Project management<br>• Site survey, configuration, and deployment<br>• Installation, text, and cutover<br>• Training<br>• Major moves, adds, and changes<br>• Design review and product staging | • Supplement existing staff<br>• Help ensure functions meet needs<br>• Mitigate risk |
| **Cisco SP Base Support and Service Provider-Based Onsite Support, available directly from Cisco**<br>**Cisco Packaged Service Provider-Based Support, available through resellers** | • 24-hour access to software updates<br>• Web access to technical repositories<br>• Telephone support through the Cisco Technical Assistance Center (TAC)<br>• Advance Replacement of hardware parts | • Facilitate proactive or expedited problem resolution<br>• Lower total cost of ownership by taking advantage of Cisco expertise and knowledge<br>• Reduce network downtime |

## For More Information

http://www.cisco.com/c/en/us/products/switches/me-3800x-series-carrier-ethernet-switch-routers/index.html

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.



Printed in USA C78-601950-12 01/15