

## ES3528/ES3528-WDM

### Layer 2 WDM Metro Access Switch

#### Product Overview

The Edge-Core ES3528/ES3528-WDM Metro Access Switch family is optimized to provide service provider with an easy to maintain hardware, and application specific software at the access of the metro Ethernet network. With all front connector, fan, and power supply design the ES3528/ES3528-WDM Metro Access Switch Series simplify field installation and troubleshooting for service providers. The Edge-Core ES3528/ES3528-WDM Metro Access Switch Series also include different types of subscriber ports to fit different provider needs from Copper, VDSL2 to WDM. The ES3528/ES3528-WDM Metro Access Switch Series also includes Metro specific security, QoS, and Management software features to enable service providers to deliver a secure triple play service while checking end to end connectivity for customers. The ES3528/ES3528-WDM Metro Access Switch is a series of next generation switches designed by Edge-Core to provide service providers to fulfill the needs of metro access network demands for the future



#### Key Features and Benefits

##### Flexible Uplink Options

The dual Combo Gigabit Ethernet ports allow copper or fiber connections depend on different network environment needs. The fiber connection uses SFP and can accommodate a wide range of transceivers, from 1000BASE-SX, 1000BASE-LX, to 1000BASE-LH. The ES3528/ES3528-WDM Metro Access Switch Series also includes 2 expansion slot to accommodate different types of modules from Gigabit Ethernet, GPON or GEAPON connections

##### Easy to Maintain and Deploy for Service

###### Providers

The ES3528/ES3528-WDM Metro Access Switch Series is built with 2 power supply slots to provide service provider with redundancy, and variety. Depend on the environment the ES3528/ES3528-WDM can either fit a DC power or AC power supply

##### Metro Ethernet Specific Software

The ES3528/ES3528-WDM Metro Access Switch Series was designed to fit within the Metro Ethernet, feature enhancement Such as 802.3ah, Q in Q, Carrier Class Rate-Limit, QoS, and subscriber isolation was added to help service providers deploy, manage, and secure their services.

##### Built to offer Triple Services

The ES3528/ES3528-WDM Metro Access Switch Series is built to help service provider offer data, voice, video within one network. With enhance multicast and QoS features service can offer services such as IPTV, VoIP, and Internet access within the same network and without interference from each other.

##### Enhance Security features

The ES3528/ES3528-WDM Metro Access Switch Series was designed to provide enhance security at the Metro Access and was built with Subscriber Security, Switch Security, and Network Security features to help secure the Metro Ethernet Network.

Subscriber is where service provider delivers their service to, but usually many subscriber shares a common device. To prevent each subscriber network traffic from effecting each other the ES3528/ES3528-WDM Metro Access Series Switch provides Private VLAN, DHCP Snooping, IP Source Guard to help protect the subscriber from affecting each other and unwanted attacks.

To prevent the switch from unwanted attacks from CPU, the ES3528/ES3528-WDM Metro Access Switch Series also provided several features for Switch Security. The protection of CPU is crucial for the switch, if CPU is attacked control packets could be dropped resulting in network down. The ES3528/ES3528-WDM includes features such as Storm Control Protection, Port Security to help prevent CPU down. To ensure only valid traffic is allowed through the switch the ES3528/ES3528-WDM Metro Access Series Switch includes IEEE802.1x, L2/L3/L4 ACL to control traffic and validate traffic going through the switch.

##### Operation Administration Maintenance (OAM) for Ethernet

The services provider network is complex and large with huge user base, to help service provider isolate, maintain, and manage network traffic the ES3528/ES3528-WDM Metro Access Switch Series comes with OAM features to address the needs of the service provider and help maintain their network services..



## Features

### Physical Ports

24 10/100 BASE-TX ports (ES3528)  
 24 10/100 BASE-BX ports (ES3528-WDM)  
 2 Combo Gigabit Ethernet (RJ-45/SFP) ports  
 2 expansion slot for modules  
 1 RJ-45 craft port  
 1 RS-232 console port

### Performance

Switching Capacity: 12.8Gbps  
 Forwarding Rate: 9.5Mpps  
 MAC Address Table Size: 16K  
 Packet Buffer Size: 256Mb  
 Jumbo Frame:9K

### L2 Features

Auto-negotiation for port speed and duplex mode  
 Flow Control: IEEE 802.3x & Back-Pressure  
 Spanning Tree Protocol:  
 ■ IEEE 802.1D Spanning Tree Protocol (STP)  
 ■ IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)  
 ■ IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)  
 VLANs:  
 ■ 4K IEEE 802.1Q VLANs  
 ■ Port-based VLAN  
 ■ Protocol VLAN  
 ■ Private VAN  
 ■ GVRP  
 ■ Q-in-Q  
 Link Aggregation:  
 ■ Static Trunk,  
 ■ IEEE 802.3ad LACP  
 ■ Load Balancing  
 ■ Trunk groups: 12  
 ■ Trunk links: 2~8 for Ethernet port  
 ■ Trunk links: 2 for Combo Gigabit Ethernet port  
 IGMP:  
 ■ IGMP v1, v2, v3  
 ■ IGMP Snooping, Querier and Proxy\*  
 ■ 255 IGMP Groups  
 ■ MVR

### QoS Features

8 Priority Queues  
 Priority Queues Scheduling Scheme  
 ■ WRR  
 ■ Strict Priority  
 ■ WRR+Strict Priority Hybrid\*  
 Traffic classification and priority management  
 ■ IEEE 802.1p  
 ■ IP Precedence/DSCP,  
 ■ TCP/UDP port number,  
 DiffServ  
 Rate Limiting  
 ■ Ingress/Egress  
 ■ 64Kbps~100Mbps for Ethernet port  
 ■ 1Mbps~1000Mbps for Gigabit port  
 ■ Per Port COS

### Warranty

Limited lifetime warranty

### Security

Port Security  
 IP Source Guard  
 DHCP Snooping  
 DHCP Option 82  
 IEEE 802.1X  
 ■ Port-based  
 RADIUS authentication  
 ■ 2 servers  
 ■ Encryption: MD5, TLS, TTLS  
 TACACS+ authentication  
 HTTPS/SSH  
 Access Control List (ACL)  
 ■ IP-based  
 ■ MAC-based  
 ■ IP/MAC-based  
 ■ VLAN  
 ■ TCP/UDP port  
 Storm Control  
 ■ Broadcast  
 ■ Multicast  
 ■ Unknown Unicast

### Management

Switch Management:  
 ■ CLI via console port or Telnet  
 ■ Web management  
 ■ SNMP v1, v2c, v3  
 Firmware & Configuration:  
 ■ Dual firmware configuration files  
 ■ Firmware Configuration upgrade via TFTP/FTP/Xmodem server  
 RMON (groups 1,2,3 and 9)  
 SNMP (RFC2030)  
 Port Mirroring  
 Event/Error/System Log  
 System monitoring  
 Test and Performance Monitoring function  
 IEEE802.3ah Ethernet in the First Mile\*

### Mechanical

Dimensions (H x W x D): 67x 436 x 253 mm (1.5RU)  
 Weight: 4.6 kg (10.1 lbs)  
 Power Requirement:  
 ■ AC Input: 100~240 V, 50~60 Hz, 2 A  
 ■ DC Input: ±36VDC~±72VDC  
 Power Consumption: Max. 35W  
 LED Indicators: Power, Port status

### Safety

CSA/NRTL (UL60950, CSA 22.2.No 60950-00)  
 TUV/GS (EN60950)  
 CB

### Electromagnetic Compatibility

CE Mark  
 FCC Class A  
 VCCI Class A

### Environmental Specifications

Temperature:  
 ■ IEC 68-2-14  
 ■ -20°C to 65°C (Standard Operating)  
 ■ -40°C to 70°C (Non-Operating)  
 MTBF  
 ■ 80,000hrs (min), at 40°C degree  
 ■ 150,000hrs (min) at 25°C degree

\* Future Release



## Optional Accessory

Model Number	Product Description
<b>Metro Access Switch</b>	
<b>ES3528</b>	24 10/100 BASE-TX Ports 2 Combo Gigabit Ethernet (RJ-45/SFP) 2 Expansion Slots Ethernet Metro Access Switch (Power Supply Not Included)
<b>ES3528-WDM</b>	24 10/100 BASE-BX Ports 2 Combo Gigabit Ethernet (RJ-45/SFP) 2 Expansion Slots WDM Metro Access Switch (Power Supply Not Included)
<b>Metro Access Switch Components</b>	
<b>EM3528-Fan</b>	ES3528 Metro Access Series Switch Fan
<b>EM3528-AC</b>	ES3528 Metro Access Switch AC Supply
<b>EM3528-DC</b>	ES3528 Metro Access Switch DC Supply (-36VDC~-72VDC)
<b>EM3526V-1GTGB-Combo</b>	RJ-45/SFP Combo module
<b>Consumer Premises Equipment (CPE)</b>	
<b>EC3002</b>	WDM CPE 1 10/100 BASE-FX port 1 10/100 BASE-TX port
<b>EC3805F</b>	Fast Ethernet FTTx CPE 4 10/100 Base TX RJ-45 LAN ports 1 100 Base-BX WAN port
<b>SFP Transceiver</b>	
<b>ET4201-SX</b>	SFP MM 850 nm, 3.3V 500m (SX)
<b>ET4201-LX</b>	SFP SM 1310 nm, 3.3V 10Km (LX)
<b>ET4201-LHX</b>	SFP SM 1310 nm, 3.3V 40Km (LHX)
<b>ET4201-ZX</b>	SFP SM 1550 nm, 3.3V 80Km (ZX)