IPES-3424DSFP-2P

24 10/100TX PoE + 4 DualSpeed SFP Industrial L2+ Switch w/ Enhanced G.8032 Ring

- *High-density 10/100TX L2+ managed PoE at/af switch*
- *Support dual power redundancy AC&DC*
- *Enhanced G.8032 ring protection < 20ms for single ring. Supports auto mode, enhanced mode, train mode and basic mode; Enhanced G.8032 ring covers multicast packets; MSTP 16MSTI /RSTP; support MRP ring*
- *Supports PoE management*
- *Support LACP link aggregation, IGMP v3/router port, MLD snooping, DHCP server & DHCP Option82; Port based DHCP distribution, Mac based DHCP server, DHCP Snooping, QoS by VLAN, SSH v2/SSL, HTTPS, INGRESS/EGRESS ACL L2/L3,TACACS+**, QinQ*
- *Protocol based VLAN ; IPv4 Subnet based VLAN*
- *Miss-wiring avoidance & Node failure protection*
- *User friendly UI, including auto topology drawing and DDM threshold monitoring with dB values***, Complete CLI supported*
- *USB slot for edited restoration and auto backup*

OVERVIEW

Lantech IPES-3424DSFP-2P is a high performance L2+ (Gigabit uplink) switch with 24 10/100/1000T w/ 24 PoE 802.3af/802.3at + 4 Dual Speed SFP. It delivers ITU G.8032 enhanced ring recovery less than 20ms in single ring while also supports train ring, enhanced mode, multiple VLAN model. The comprehensive QoS, QoS by VLAN, advanced security including INGRESS/EGRESS ACL L2/L3, TACACS+**, SSH v2/SSL, Mac based DHCP server, DHCP Option 82, DHCP server, IGMPv1/v2/v3/router port, QinQ are supported and also required in large network.

Compliant with IEEE802.3at/af standard, the Lantech IPES-3424DSFP-2P is able to feed each PoE port up to 30Watts@54VDC providing the connected PD devices at 10/100M speed. It also supports advanced PoE management including PoE detection and scheduling. PoE detection can detect if the connected PD still alive then sending power; PoE scheduling is to allow pre-set power feeding schedule upon routine time table. Per port PoE states explicit voltage, current, watt and PoE temperature information.

Miss-wiring avoidance, Loop protection, Node failure protection

The IPES-3424DSFP-2P also embedded several features for stronger and reliable network protection in an easy and intuitive way. When the pre-set ring configuration failed or looped by miss-wiring, Lantech IPES-3424DSFP-2P is able to alert with the LED indicator and disable ring automatically. Node failure protection ensures the switches in a ring to survive after power breakout is back. The status can be shown in NMS when each switch is back. This feature prevents the broken ring and keep ring alive without any re-configuration needed. Loop protection is also available to prevent the generation of broadcast storm when a dumb switch is inserted in a closed loop connection.

Enhanced G.8032 ring, 16 MSTI MSTP; MRP ring

Lantech IPES-3424DSFP-2P features enhanced G.8032 ring which can be self-healed in less than 20ms for single ring topology protection covering Multicast packets. It also supports various ring topologies that covers double ring, multi-chain (under enhanced ring), train ring, basic ring, multiple-VLAN ring and auto-ring by easy setup than others. The innovative auto-Ring configurator (auto mode) can calculate owner and neighbor in one step. It supports MSTP that allows RSTP over VLAN for redundant links with 16 MSTI.

MRP (Media Redundancy Protocol) can be supported for industrial automation networks.

DHCP option 82 & Port based, Mac based DHCP, Option66, DHCP Snooping, IPv6 DHCP server

DHCP server can assign dedicated IP address by MAC or by port (Port based for single switch), it also can assign IP address by port for multiple switches with single DHCP option82 server. DHCP Snooping is supported. For the ending device which need to download file from TFTP server, DHCP Option66 server can offer IP address of TFTP server to DHCP client. Basic IPv6 DHCP service can be supported.

QoS by VLAN for legacy devices

QoS by VLAN can allow switch to tag QoS by VLAN regardless the devices acknowledge QoS or not in which greatly enhance the bandwidth management in a network.

QinQ, QoS and GVRP supported

It supports the QinQ, QoS, GVRP for large VLAN segmentation.

IGMPv3,GMRP, router port, MLD Snooping, static multicast forwarding and multicast Ring protection

The unique multicast protection under enhanced G.8032 ring can offer immediate self-recovery instead of waiting for IGMP table timeout. It also supports IGMPv3, GMRP, router port, MLD snooping and static multicast forwarding binding by ports for video surveillance application.

802.1X security by MAC address

MAC-based port authentication is an alternative approach to 802.1x for authenticating hosts connected to a port. By authenticating based on the host's source MAC address, the host is not required to run a user for the 802.1x protocol. The RADIUS server that performs the authentication will inform the switch if this MAC can be registered in the MAC address table of switch.

Auto-provisioning for firmware/configuration update

The switch supports auto-provisioning for switch to auto-check the latest software image and configuration through TFTP server.

User friendly GUI, Auto topology drawing

The user friendly UI, innovative auto topology drawing and topology demo makes IPES-3424DSFP-2P much easier to get hands-on. The IPES-3424DSFP-2P supports DMI interface that can correspond with DDM SFPs (Digital diagnostic monitor) to display the five parameters in Lantech's UI, including optical output power, input power, temperature, laser bias current and transceiver supply voltage***. The TX power/RX power raw data is automatically converted to dB values for installer, making it easier to calculate the fiber distance. The complete CLI enables professional engineer to configure setting by command line.

Editable configuration file; USB port for configuration upload & download

The configuration file of Lantech IPES-3424DSFP-2P can be exported and edited with word processor for the other switches configuration with ease. The factory reset button can restore the setting back to factory default and built-in watchdog design can automatically reboot the switch when CPU is found dead.

The built-in USB port can have configuration upload & download by USB dongle.

Event log & message; 2 DI / 2 DO

In case of event, the IPES-3424DSFP-2P is able to send an email to pre-defined addresses as well as SNMP Traps our immediately. It provides 2 DI and 2 DO. When disconnection of the specific port was detected; DO will activate the signal LED to alarm. DI can integrate the sensors for events and DO will trigger the alarm while sending alert information to IP network with email and traps.

Various dual power conversions redundancy; Relay contact alarm

Lantech IPES-3424DSFP-2P supports dual power redundancies with isolated 100~240VAC/120~370VDC power conversion and isolated 36~75VDC power conversion or with non-isolated 12~60VDC power module to increase the network reliability. It also supports terminal block for connecting DC 48V PoE power source. Featured with relay contact alarm function, the IPES-3424DSFP-2P is able to connect with alarm system in case of power failure. The IPES-3424DSFP-2P also provides ±4000V EFT, ±4000V Surge and ±8000V ESD protection, which can reduce unstable situation caused by power line and Ethernet.

Industrial hardened design for extended temperature operation

Lantech IPES-3424DSFP-2P features high reliability and robustness withstanding extensive EMI/RFI phenomenon, lighting surge, inductive load switching, high ESD, high fault current, environmental vibration and shocks usually found in factory, substation, steel automation, aviation, mining and process control. It is the best solution for Automation, transportation, surveillance, Wireless backhaul, Semi-conductor factory and assembly lines.

Lantech IPES-3424DSFP-2P can run under widely operational temperature (-40°C~75°C) in the harsh environment.

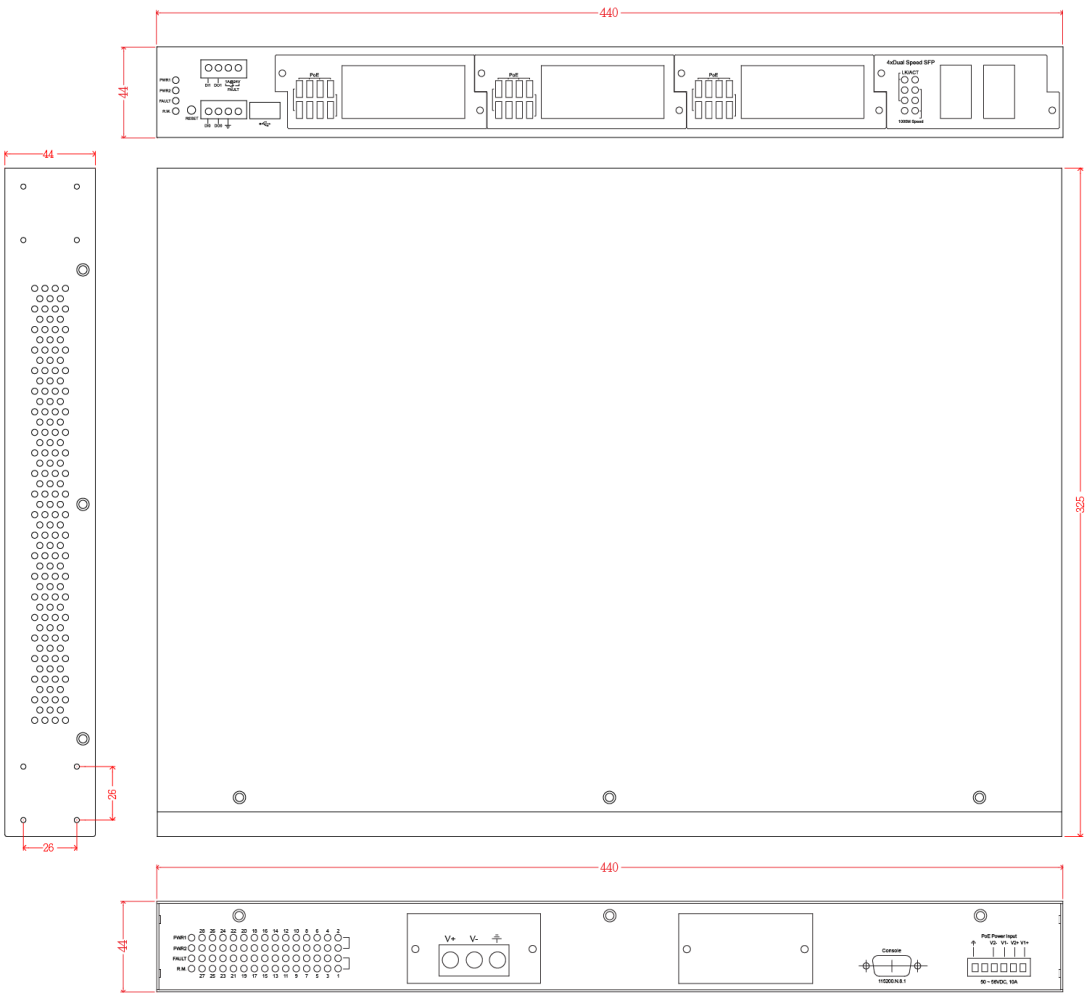
FEATURES & BENEFITS

- **System Interface/Performance**
  - *24x10/100TX PoE at/af+ 4 100M/1000M SFP L2+*
  - *16K MAC Address Table*
  - *Dual isolated power conversions for 1600V DC(36V~75V)*
  - *Dual isolated power conversions for ±3000 V (100~240VAC/120~370VDC)*
  - *Dual power supply terinal block for non-isolated power DC(12V~60V)*
  - *Rear terminal block for PoE power source(DC48V)*
  - *PoE power input with budget up to 720W*
  - *-40to 75C operation temperature(-E model)*
- **PoE management including PoE detection and scheduling for PD (power devices); per Port PoE**

status includes voltage, current, watt and PoE temperature

- **DDM to support SFP diagnostic function*****
  - *Automatically convert the raw data into dB values for TX power/RX power, making it easier to measure the fiber distance*
- **VLAN**
  - *4K 802.1Q Vlan, Port Based VLAN,GVRP,QinQ,MVRP**
- **Port Trunk with LACP 127 trunks with automatic link failover**
- **QoS (Quality of Service)**
- **Port Trunk with LACP 127 trunks with automatic link failover**
- **Security**
  - *SSL/SSH v2/INGRESS/EGRESS ACL L2/L3*
  - *MAC address table: MAC address entries/Filter/MAC-Port binding*
  - *IP Security: IP address security management to prevent unauthorized intruder.*
  - *Management access control with priority*
  - *Login Security: IEEE802.1X/RADIUS*
  - *HTTPS for secure access to the web interface*
  - *TACACS+***
- **Miss-wiring avoidance**
  - *LED indicator*
  - *Email or traps notification*
- **Node failure protection**
  - *Ensure the switches in a ring to survive after power breakout is back*
  - *The status can be shown in NMS when each switch is back*
- **IGMP v1,v2,v3 for video surveillance application; GMRP**
- **IGMP Query mode and support dynamic IGMP router port for reversed multicast video flow and assign another query in a ring**
- **Enhanced G.8032 Ring protection in 20ms for single ring**
  - *Support various ring/chain topologies, including dynamic coupling ring*
  - *Enhanced G.8032 ring configuration with ease*
  - *Auto ring configuration(auto mode) for single ring*
  - *Ring covers multicast on different ports*
- **Auto topology drawing in web UI with detail node info**
- **Auto configurator for auto ITU ring setup**
- **256 groups MSTP over VLAN**
- **Supports IEEE802.1ab LLDP, Cisco CDP**
- **DHCP server / client / DHCP Option 82 relay / DHCP Option 82 server; Port based DHCP server; DHCP Snooping, DHCP Option 66; basic IPv6 DHCP server**
- **Mac based DHCP server to assign IP address that includes dumb switches in DHCP network**
- **MLD Snooping for IPv6 Multicast stream**
- **Bandwidth Control**
  - *Ingress Packet Filter and Egress Rate Limit*
  - *Broadcast/Multicast Packet Filter Control*
- **System Event Log, Email alert and SNMP Trap for alarm support; 32 RMON**
- **TFTP/HTTP Firmware upgrade; Redundant firmware to avoid crashing in case of upgrade failure**
- **Reset / Factory default button to restore factory setting**
- **Watch dog design to reboot switch under certain circumstances**
- **Diagnostic including Ping / ARP table / DDM information**
- **Provides EFT protection ±4000 VDC for power line**
- **Supports ±8000 VDC Ethernet ESD protection**
- **2 DI/DO and 1 relay contact alarm**
- **Support USB dongle for auto backup/edited restoration configuration**
- **Auto Provision to verify switch firmware with the latest or certain version**

DIMENSIONS (unit=mm)



SPECIFICATION

Hardware Specification

IEEE Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Ethernet IEEE 802.3ab 1000Base-T Ethernet IEEE 802.3z Gigabit Fiber IEEE 802.3x Flow Control Capability ANSI/IEEE 802.3 Auto-negotiation IEEE 802.1Q VLAN IEEE 802.1p Class of Service IEEE 802.1X Access Control IEEE 802.1D Spanning Tree IEEE 802.1w Rapid Spanning Tree IEEE 802.1s Multiple Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.1AB Link Layer Discovery Protocol (LLDP) IEEE 802.1x User Authentication (Radius) IEEE 802.3t/af Power Over Ethernet
Switch Architecture	Back-plane (Switching Fabric): 12.8Gbps
Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Ethernet / Gigabit Fiber port
CPU	Marvell 800Mhz
RAM	256M Byte
Flash	128M Byte
MAC Address	16K MAC address table
Jumbo frame	10KB on all ports
PoE pin assignment	RJ-45 port # 1~ # 24 support IEEE 802.3at/af End-point. Per port provides up to 30W Positive (VCC+): RJ-45 pin 1,2. Negative (VCC-): RJ-45 pin 3,6.
PoE input voltage & Power feed voltage	Input V / Active Mode A /Output V 45~56V(af) / 48V@15W 54~56V(at) / 54V@30W (50-56VDC input is recommended for 802.3at 30W applications)
Connectors	24 10/100TX RJ-45 with auto MDI/MDI-X function 4 100M / 1000M Mini-GBIC : SFP sockets

	RS-232 console: Female DB-9 USB for automatic backup and restore
DDM	Conform to SFF-8472 to show diagnostic SFP with temperature, current, voltage, input and output power
Protocol	CSMA/CD
LED	Per unit: Power 1 (Green), Power 2 (Green), Alarm (Red) ,R.M (Green) Link/Activity (Green), Full duplex/collision(Yellow)), MINI GBIC (Link/Activity)(Green)
Power Supply	Two power sockets for switch system, 9.5~60VDC input IEC320 100~240VAC conversion (-AC model) AC/DC 100~240VAC/120~370VDC conversion (-HV model) 48VDC for PoE
Power Consumption	Full load: 30W/ Unload: 13W
PoE Power Budget	Max. 720W at rear side with external dual 48V input (50-56VDC input is recommended for 802.3at 30W applications) Higher PoE budget can be applied upon request. **
Relay Alarm	Provides one relay output for port breakdown, power fail and alarm. Alarm Relay current carry ability: 1A @ DC24V
DI/DO	2 Digital Input (DI) : Level 0: -30~2V / Level 1: 10~30V Max. input current:8mA 2 Digital Output(DO): Open collector to 40 VDC, 200mA
RTC	RTC(Real Time Clock) to keep track of time always
Factory reset button & watch dog design	Factory reset button to restore back to factory default settings. Watch dog design can reboot switch automatically when CPU is found dead
Case Dimension	19" Metal case,IP-30; 440mm(W)x325mm(D)x44mm(H)
Weight	2.9 kgs
Operating Humidity	5%~95% (Non-condensing)
Operating Temperature	Standard: -20˚C ~60˚C Extended temperature : -40˚C ~75˚C
Storage Temperature	-40˚C ~85˚C
EMI	FCC Class A, CE EN61000-4-2 (ESD), CE EN61000-4-3 (RS), CE EN-61000-4-4 (EFT), CE EN61000-4-5 (Surge), CE EN61000-4-6 (CS), CE EN61000-4-8, CE EN55032 Class A, CE EN55024
Safety	EN IEC 62368-1
Stability Testing	IEC 60068-2-6: 2007 (Vibration) IEC 60068-2-27: 2008 (Shock)
Warranty	5 years

Software Specification

Management	SNMP v1 v2c, v3/ Web/Telnet/CLI
SNMP MIB	MIB MIBII SNMP MIB Bridge MIB IF MIB RMON MIB Private MIB
VLAN	Port Based VLAN IEEE 802.1Q Tag VLAN (256 entries)/ VLAN ID (Up to 4K, VLAN ID can be assigned from 1 to 4096) GVRP, QinQ, QoS, Protocol based VLAN; IPv4 Subnet based VLAN
Port Trunk with LACP	LACP Port Trunk: 8 Trunk groups
LLDP	Support LLDP to allow switch to advise its identification and capability on the LAN
CDP	Cisco Discovery protocol for topology mapping
ITU G.8032	Support ITU G.8032 v2/2012 for Ring protection in less than 20ms for self-heal recovery (single ring enhanced mode) Support various ring/chain topologies Includes train ring, auto ring, basic single ring, enhanced ring, multiple-VLAN ring Enhanced G.8032 ring configuration with ease Cover multicast & data packets protection
User friendly UI	1. Auto topology drawing 2. Topology demo 3. DDM threshold monitoring with dB values*** 4. Complete CLI supported
PoE Management	1. PoE Detection to check if PD is hang up then restart the PD 2. PoE Scheduling to On/OFF PD upon routine time table 3. Per-port PoE status including current, voltage, watt and temperature
Spanning Tree	Supports IEEE802.1d Spanning Tree and IEEE802.1w Rapid Spanning Tree, IEEE802.1s Multiple Spanning Tree 16 MSTI
Quality of Service	The quality of service determined by port, Tag and IPv4 Type of service, IPv4 Differentiated Services Code Points - DSCP
Class of Service	Support IEEE802.1p class of service, per port provides 8 priority queues
QoS by VLAN	Tagged QoS by VLAN for all devices in the network
MLD Snooping	Support IPv6 Multicast stream
IP Security	Supports 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder
Port Mirror	Support 3 mirroring types: "RX, TX and Both packet"
IGMP	Support IGMP snooping v1,v2,v3; Supports IGMP static route; 1024 multicast groups; IGMP router port ; IGMP query; GMRP
Static MAC-Port Bridge	Static multicast forwarding forward reversed IGMP flow with multicast packets binding with ports for IP surveillance application
Bandwidth Control	Support ingress packet filter and egress packet limit. The egress rate control supports all of packet type, the limit rates are 0~100Mbps. Ingress filter packet type combination rules are Broadcast/Multicast/Flooded Unicast packet, Broadcast/Multicast packet, Broadcast packet only and all types of packet. The packet filter rate can be set from 0 to 100Mbps The packet filter rate can be set an accurate value through the pull-down menu for the ingress packet filter and the egress packet limit.

Network Security	Support 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder. 802.1X access control for port based and MAC based authentication/MAC-Port binding Management access control with priority Ingress/Egress ACL L2/L3 SSL/ SSH v2 for Management HTTPS for secure access to the web interface TACACS+** for Authentication
Flow Control	Support Flow Control for Full-duplex and Back Pressure for Half-duplex
Protection	1. Miss-wiring avoidance 2. node failure protection 3. Loop protection
System Log	Support System log record and remote system log server
SNMP Trap	Up to 10 trap stations; trap types including: 1. Device cold start 2. Authorization failure 3. Port link up/link down 4. DI/DO open/close 5. Typology change(ITU ring) 6. Power failure 7. Environmental abnormal
DHCP	Provide DHCP Client/ DHCP Server/DHCP Option 82/Port based DHCP; DHCP Option 66; DHCP Snooping, basic IPv6 DHCP server
Mac based	Assign IP address by Mac that can include dumb

DHCP Server	switch in DHCP network
DNS	Provide DNS client feature and support Primary and Secondary DNS server.
Diagnostic	Support Ping, ARP table and DDM information
SNTP	Support SNTP to synchronize system clock in Internet
Environmental Monitoring	Internal sensor to detect temperature, voltage and current and send SNMP traps and emails if any abnormal events
Factory reset button & watch dog design	Factory reset button to restore back to factory default settings. Watch dog design can reboot switch automatically under certain circumstances
Firmware Update	Supports TFTP firmware update, TFTP backup and restore; HTTP firmware upgrade
USB Configuration backup and restore	Supports text editable configuration file for system quick installation to backup and restore USB dongle for automatic back up and editable restore
Auto Provision	To verify switch firmware with the latest or certain version

*Future Release

**Optional

***Optional DDM SFP required

ORDERING INFORMATION

For optional power supply, add +DC, +DCI, +AC, or +HV to the part number.

- **IPES-3424DSFP-2P…….....P/N: 8380-602**
  24 10/100TX POE at/af + 4 Dual SFP L2 plus Industrial Switch
  Built-in 1x isolated DC 12~56VDC power supply + 1x optional power socket + 1x 48VDC PoE power input; -20˚C to 60˚C
- **IPES-3424DSFP-2P-E…….....P/N: 8380-603**
  24 10/100TX POE at/af + 4 Dual SFP L2 plus Industrial Switch
  Built-in 1x isolated DC 12~56VDC power supply + 1x optional power socket + 1x 48VDC PoE power input; -40˚C to 75˚C
- **IPES-3424DSFP-2P-AC…….....P/N: 8380-604**
  24 10/100TX POE at/af + 4 Dual SFP L2 plus Industrial Switch
  Built-in 1x isolated AC100~240VAC IEC320 power conversion + 1x optional power socket + 1x 48VDC PoE power input; -20˚C to 60˚C
- **IPES-3424DSFP-2P-AC-E…….....P/N: 8380-605**
  24 10/100TX POE at/af + 4 Dual SFP L2 plus Industrial Switch
  Built-in 1x isolated AC100~240VAC IEC320 power conversion + 1x optional power socket + 1x 48VDC PoE power input; -40˚C to 75˚C
- **IPES-3424DSFP-2P-HV…….....P/N: 8380-606**
  24 10/100TX POE at/af + 4 Dual SFP L2 plus Industrial Switch
  Built-in 1x isolated AC/DC 100~240VAC/120~370VDC power conversion + 1x optional power socket + 1x 48VDC PoE power input; -20˚C to 60˚C
- **IPES-3424DSFP-2P-HV-E…….....P/N: 8380-607**
  24 10/100TX POE at/af + 4 Dual SFP L2 plus Industrial Switch
  Built-in 1x isolated AC/DC 100~240VAC/120~370VDC power conversion + 1x optional power socket + 1x 48VDC PoE power input; -40˚C to 75˚C

OPTIONAL ACCESSORIES

Power

EOTH000701

Isolation Power 100-240VAC, 120-370VDC 2.0A max, 47-63HZ

EOTH000703

Isolation Power 100-240VAC IEC320 socket, 2.0A max, 47-63HZ

EOTH000704

Power Input Module 12-56VDC, 2.5A

DIN Rail Power

- **NDR-480 Series** 480W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C)
- **NDR-240 Series** 240W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C)
- **NDR-120 Series** 120W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C; For 115VAC, please refer to derating curve on NDR-120 Series datasheet)
- **NDR-75 Series** 75W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C; For 115VAC, please refer to derating curve on NDR-120 Series datasheet)

Mini GBIC (SFP)

- **8330-162-V1** MINI GBIC 1000SX (LC/MM/0.5KM) Transceiver
- **8330-163-V1** MINI GBIC 1000SX2 (LC/MM/2KM) Transceiver
- **8330-165-V1** MINI GBIC 1000LX (LC/SM/10KM) Transceiver
- **8340-0591-V1** MINI GBIC 1000LHX (LC/SM/40KM) Transceiver
- **8330-166-V1** MINI GBIC 1000XD (LC/SM/50KM) Transceiver
- **8330-169-V1** MINI GBIC 1000XD (LC/SM/60KM) Transceiver
- **8330-167-V1** MINI GBIC 1000ZX (LC/SM/80KM) Transceiver
- **8330-170-V1** MINI GBIC 1000EZX (LC/SM/120KM) Transceiver
- **8330-168-V1** MINI GBIC 10/100/1000T (100m) Transceiver
- **8330-060-V1** MINI GBIC 100Base (LC/MM/2KM) Transceiver
- **8330-065-V1** MINI GBIC 100Base (LC/MM/5KM) Transceiver
- **8330-061-V1** MINI GBIC 100Base (LC/SM/30KM) Transceiver
- **8330-197-V1** 1.25Gbps BiDi SFP 0.5KM Transceiver (WDM 1310)
- **8330-198-V1** 1.25Gbps BiDi SFP 0.5KM Transceiver (WDM 1550)
- **8330-195-V1** 1.25Gbps BiDi SFP 2KM Transceiver (WDM 1310)
- **8330-196-V1** 1.25Gbps BiDi SFP 2KM Transceiver (WDM 1550)
- **8330-188-V1** 1.25Gbps BiDi SFP 10KM Transceiver (WDM 1310)
- **8330-189-V1** 1.25Gbps BiDi SFP 10KM Transceiver (WDM 1550)
- **8330-186-V1** 1.25Gbps BiDi SFP 20KM Transceiver (WDM 1310)
- **8330-187-V1** 1.25Gbps BiDi SFP 20KM Transceiver (WDM 1550)
- **8330-180-V1** 1.25Gbps BiDi SFP 40KM Transceiver (WDM 1310)
- **8330-182-V1** 1.25Gbps BiDi SFP 40KM Transceiver (WDM 1550)
- **8330-181-V1** 1.25Gbps BiDi SFP 60KM Transceiver (WDM 1310)
- **8330-183-V1** 1.25Gbps BiDi SFP 60KM Transceiver (WDM 1550)
- **8330-184-V1** 1.25Gbps BiDi SFP 80KM Transceiver (WDM 1490)
- **8330-185-V1** 1.25Gbps BiDi SFP 80KM Transceiver (WDM 1550)
- **8330-071-V1** 125Mbps BiDi SFP 2KM (WDM 1310) Transceiver
- **8330-072-V1** 125Mbps BiDi SFP 2KM (WDM 1550) Transceiver
- **8330-069-V1** 125Mbps BiDi SFP 20KM (WDM 1310) Transceiver
- **8330-068-V1** 125Mbps BiDi SFP 20KM (WDM 1550) Transceiver
- **8330-080-V1** 125Mbps BiDi SFP 40KM (WDM 1310) Transceiver
- **8330-082-V1** 125Mbps BiDi SFP 40KM (WDM 1550) Transceiver
- **8330-081-V1** 125Mbps BiDi SFP 60KM (WDM 1310) Transceiver
- **8330-083-V1** 125Mbps BiDi SFP 60KM (WDM 1550) Transceiver
- **8330-084-V1** 125Mbps BiDi SFP 80KM (WDM 1310) Transceiver
- **8330-085-V1** 125Mbps BiDi SFP 80KM (WDM 1550) Transceiver
- **8330-191-V1** Dual Speed SFP 100M/1000M-LX 10KM Transceiver

All SFP# ended with D are with DDM function

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