EDS-205A/208A Series Quick Installation Guide

Moxa EtherDevice Switch

Version 8.4, August 2022

Technical Support Contact Information
www.moxa.com/support

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P/N: 180200205002C

Overview

The EDS-205A/208A series of industrial Ethernet switches are entry-level industrial 5 and 8-port Ethernet switches that support IEEE 802.3, IEEE 802.3u, and IEEE 802.3x with 10/100M, full/half-duplex, and MDI/MDIX auto-sensing.

The EDS-205A/208A series provides 12/24/48 VDC (9.6 to 60 VDC) redundant power inputs. The switches are available with a standard operating temperature range from -10 to 60°C, or with a wide operating temperature range from -40 to 75°C, and IP30 metal housing makes them rugged enough for any harsh industrial environment.

To provide greater versatility for use with applications from different industries, the EDS-205A/208A also allow users to enable or disable broadcast storm protection with DIP switches on the outer panel.

The EDS-205A/208A switches can be easily installed with DIN-Rail mounting as well as distribution boxes. The DIN-rail mounting capability and IP30 metal housing with LED indicators make the plug-and-play EDS-205A/208A switches reliable and easy to use.

NOTE Throughout this Hardware Installation Guide, we use **EDS** as an abbreviation for Moxa EtherDevice Switch:
EDS = Moxa EtherDevice Switch

ATTENTION

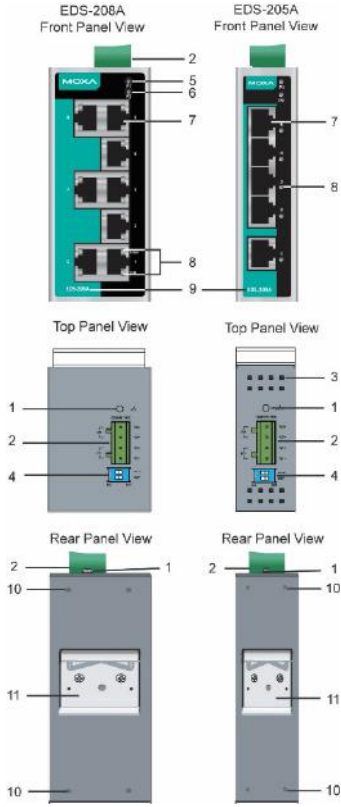
This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Package Checklist

Your EDS is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

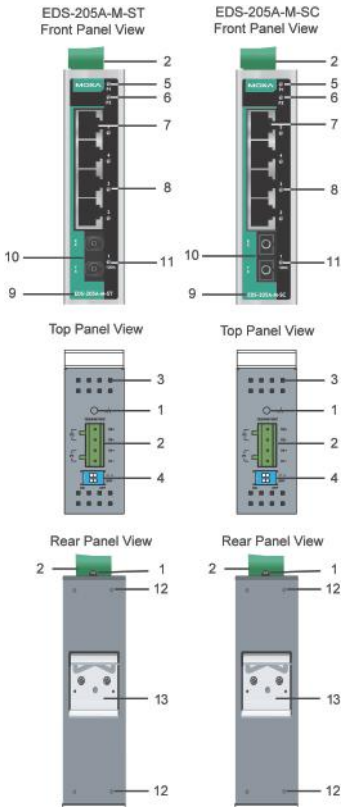
- Moxa EtherDevice™ Switch
- Quick installation guide (printed)
- Warranty card

Panel Layout of EDS-205A/208A (Standard)



1. Grounding screw
2. Terminal block for power input P1/P2
3. Heat dissipation orifices
4. DIP Switches
5. Power input P1 LED
6. Power input P2 LED
7. 10/100BaseT(X) Port
8. TP port's 10/100 Mbps LED
9. Model Name
10. Screw hole for wall mounting kit
11. DIN-Rail Kit

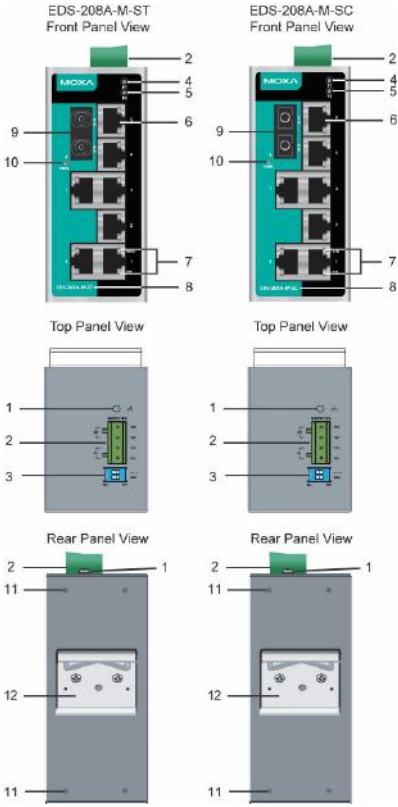
Panel Layout of EDS-205A-M-SC/ST



NOTE:
The appearance of EDS-205A-S-SC is identical to EDS-205A-M-SC.

1. Grounding screw
2. Terminal block for power input P1/P2
3. Heat dissipation orifices
4. DIP Switches
5. Power input P1 LED
6. Power input P2 LED
7. 10/100BaseT(X) Port
8. TP port's 10/100 Mbps LED
9. Model Name
10. 100BaseFX Port
11. FX port's 100 Mbps LED
12. Screw hole for wall mounting kit
13. DIN-Rail Kit

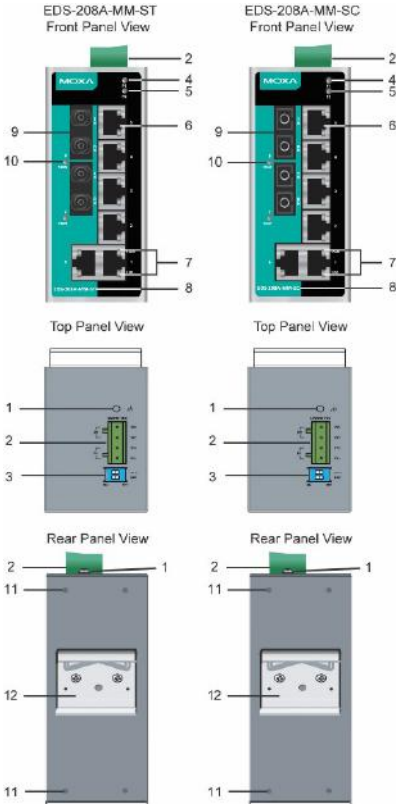
Panel Layout of EDS-208A-M-SC/ST



NOTE:
The appearance of EDS-208A-S-SC is identical to EDS-208A-M-SC.

1. Grounding screw
2. Terminal block for power input P1/P2
3. DIP Switches
4. Power input P1 LED
5. Power input P2 LED
6. 10/100BaseT(X) Port
7. TP port's 10/100 Mbps LED
8. Model Name
9. 100BaseFX Port
10. FX port's 100 Mbps LED
11. Screw hole for wall mounting kit
12. DIN-Rail Kit

Panel Layout of EDS-208A-MM-SC/ST

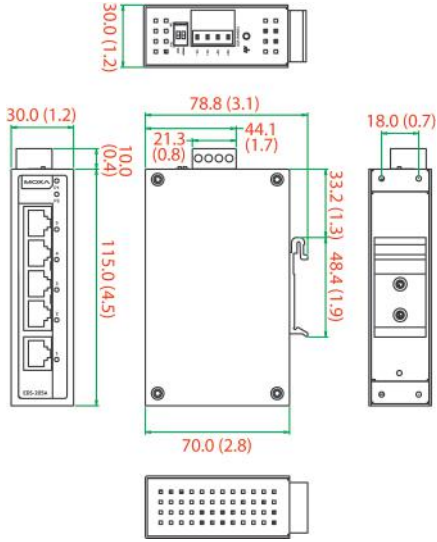


NOTE:
The appearance of EDS-208A-SS-SC is identical to EDS-208A-MM-SC.

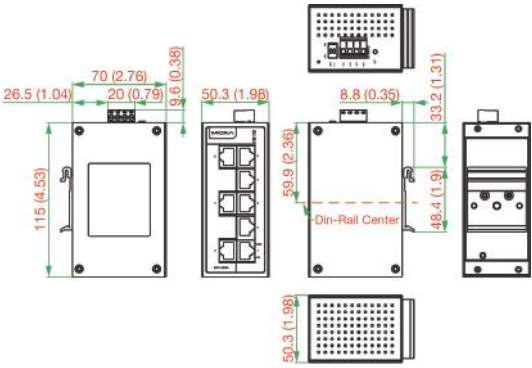
1. Grounding screw
2. Terminal block for power input P1/P2
3. DIP Switches
4. Power input P1 LED
5. Power input P2 LED
6. 10/100BaseT(X) Port
7. TP port's 10/100 Mbps LED
8. Model Name
9. 100BaseFX Port
10. FX port's 100 Mbps LED
11. Screw hole for wall mounting kit
12. DIN-Rail Kit

Mounting Dimensions

EDS-205A



EDS-208A

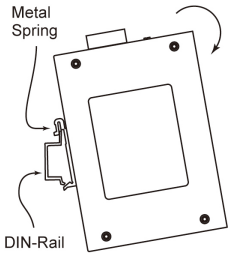


Unit = mm (inch)

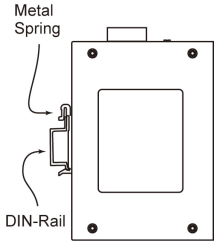
DIN-Rail Mounting

The aluminum DIN-rail attachment plate should already be fixed to the back panel of the EDS when you take it out of the box. If you need to reattach the DIN-rail attachment plate, make sure the stiff metal spring is situated towards the top, as shown in the figures below.

STEP 1:
Insert the top of the DIN-Rail into the slot just below the stiff metal spring.



STEP 2:
The DIN-Rail attachment unit will snap into place as shown below.

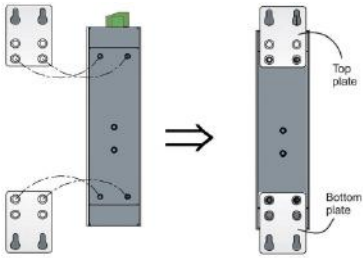


To remove the EDS from the DIN-Rail, simply reverse Steps 1 and 2 above.

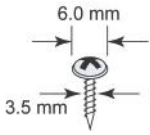
Wall Mounting (optional)

For some applications, you will find it convenient to mount the EDS-205A/208A on the wall, as shown in the following figures.

STEP 1:
Remove the aluminum DIN-Rail attachment plate from the EDS-205A/208A's rear panel, and then attach the wall mount plates as shown in the diagram at the right.



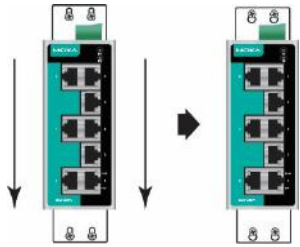
STEP 2:
Mounting the EDS-205A/208A on the wall requires 4 screws. Use the switch, with wall mount plates attached, as a guide to mark the correct locations of the 4 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure at the right.



NOTE Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the wall mounting plates.

Do not screw the screws in completely—leave about 2 mm to allow room for sliding the wall mount panel between the wall and the screws.

STEP 3:
Once the screws are fixed on the wall, insert the four screw heads through the large parts of the keyhole-shaped apertures, and then slide the EDS-205A/208A downwards, as indicated. Tighten the four screws for added stability.



ATEX and IECEx Information

II 3G

1. Certificate number
   ATEX: DEMKO 10 ATEX 0909900X
   IECEx: IECEx UL 14. 0085X (For EDS-205A Series only)
2. Ambient range
   -40°C ≤ Tamb ≤ 75°C for Models with suffix of "-T"
   -10°C ≤ Tamb ≤ 60°C for Models without suffix of "-T"
3. Certification string:
   ATEX: Ex nA IIC T4 Gc
   IECEx: Ex nA IIC T4 Gc (For EDS-205A Series only)
4. Standards covered
   EN 60079-0:2012/A11:2013/IEC 60079-0:2011 Ed.6
   EN 60079-15:2010/IEC 60079-15:2010 Ed.4 (For EDS-205A Series only)
5. The conditions of safe usage:
   - Subject devices are to be installed in an ATEX certified IP54 enclosure accessible only with use of a tool and used in an area of not more than pollution degree 2 as defined by EN 60664-1.
   - Provisions shall be made to provide the transient protection device to be set at a level not exceeding 140% of the peak rated voltage.
   - Subject devices must use conductors suitable for use at an ambient temperature of 100°C and must be suitable for the Power Supply Terminal.

NOTE Suitable for use in Class I, Division 2, Groups A, B, C and D hazardous locations, or nonhazardous locations only.

WARNING

EXPLOSION HAZARD - Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.

WARNING

EXPLOSION HAZARD - Substitution of any component may impair suitability for Class 1, Division 2

Wiring Requirements

WARNING

Safety First!

Turn the power off before disconnecting modules or wires. The correct power supply voltage is listed on the product label. Check the voltage of your power source to make sure that you are using the correct voltage. Do **NOT** use a voltage greater than what is specified on the product label.

These devices must be supplied by a SELV source as defined in the Low Voltage Directive 2014/35/EU and 2014/30/EU.

WARNING

Safety First!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

You should also pay attention to the following points:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
  NOTE: Do not run signal or communications wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring to all devices in the system when necessary.

Grounding the EtherDevice Switch

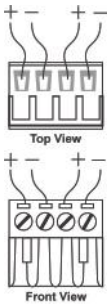
Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.

Wiring the Redundant Power Inputs

The top two contacts and the bottom two contacts of the 4-contact terminal block connector on the EDS's top panel are used for the EDS's two DC inputs. Top and front views of one of the terminal block connectors are shown here.



STEP 1:
Insert the negative/positive DC wires into the V-/V+ terminals.

STEP 2:
To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

STEP 3:
Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on EDS's top panel.

ATTENTION

Before connecting the EtherDevice Switch to the DC power inputs, make sure the DC power source voltage is stable.

NOTE For use in Pollution Degree 2 Environment" or similar environment.

Field Wiring Terminal Markings – Wiring terminals shall be marked to indicate the proper connections for power supply and load, or a wiring diagram coded to the terminal marking shall be securely attached to the device, and "Use Copper Conductors Only, Tighten to 4.5 pound-inches" or equivalent. This marking should be located adjacent to the terminal or on the wiring diagram.

Communication Connections

The EDS-205A models have 4 or 5 10/100BaseT(X) Ethernet ports, and 1 or 0 (zero) 100 BaseFX multi/single-mode (SC/ST-type connector) fiber ports. The EDS-208A models have 6, 7 or 8 10/100BaseT(X) Ethernet ports, and 2, 1 or 0 (zero) 100 BaseFX multi/single-mode (SC/ST-type connector) fiber ports.

10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on the EDS's front panel are used to connect to Ethernet-enabled devices. Below we show pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports, and also show cable wiring diagrams for straight-through and cross-over Ethernet cables.

10/100Base T(x) RJ45 Pinouts

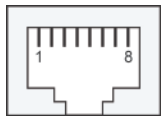
MDI Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

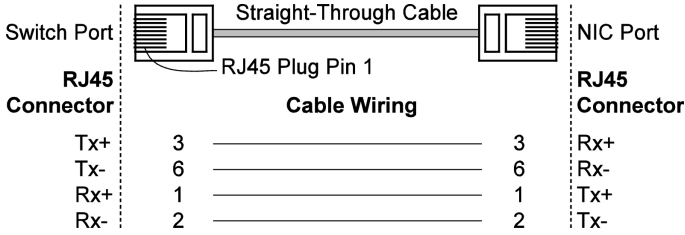
MDI-X Port Pinouts

Pin	Signal
1	Rx+
2	Rx-
3	Tx+
6	Tx-

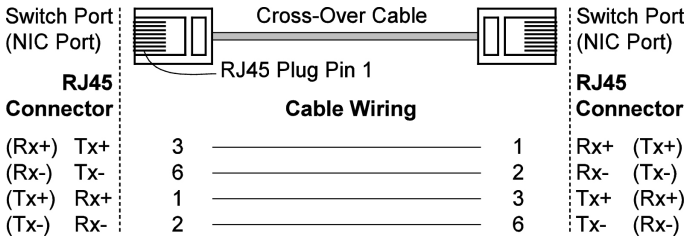
8-pin RJ45



RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring



RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring

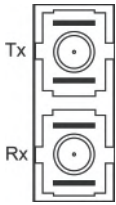


100BaseFX Ethernet Port Connection

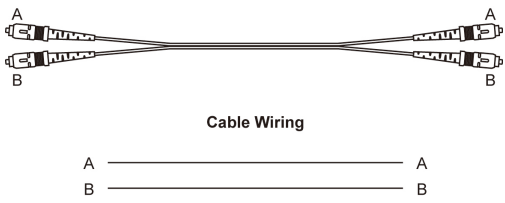
The concept behind the SC/ST port and cable is quite straightforward. Suppose you are connecting devices I and II; contrary to electrical signals, optical signals do not require a circuit in order to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used transmit data from device II to device I, for full-duplex transmission.

Remember to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you make your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A and B-to-B, as shown below, or A1-to-A2 and B1-to-B2).

SC-Port Pinouts



SC-Port to SC-Port Cable Wiring



ST-Port Pinouts

ST-Port to ST-Port Cable Wiring

Cable Wiring

ATTENTION

This is a Class 1 Laser/LED product. To avoid causing serious damage to your eyes, do not stare directly into the Laser Beam.

Redundant Power Inputs

Both power inputs can be connected simultaneously to live DC power sources. If one power source fails, the other live source acts as a backup, and automatically supplies all of the EDS's power needs.

DIP Switch Settings

EDS-205A/208A DIP Switches

The default setting for each DIP Switch is OFF. The following table explains the effect of setting the DIP Switches to the ON positions.

DIP Switch	Setting	Description
----	–	Serves no function (reserved for future use).
BSP	ON	Enables broadcast storm protection
	OFF	Disables broadcast storm protection

ATTENTION

To actively updated DIP switch settings, power off and then power on the EDS.

LED Indicators

The front panel of the Moxa EtherDevice Switch contains several LED indicators. The function of each LED is described in the table below.

LED	Color	State	Description
P1	AMBER	On	Power is being supplied to power input P1.
		Off	Power is **not** being supplied to power input P1.
P2	AMBER	On	Power is being supplied to power input P2.
		Off	Power is **not** being supplied to power input P2.
10M	GREEN	On	TP port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	TP Port's 10 Mbps link is inactive
100M	GREEN	On	TP/FX port's 100 Mbps link is active.

		Blinking	Data is being transmitted at 100 Mbps.
		Off	100Base TP/FX Port's link is inactive.

Auto MDI/MDI-X Connection

The Auto MDI/MDI-X function allows users to connect the EDS's 10/100BaseTX ports to any kind of Ethernet device, without needing to pay attention to the type of Ethernet cable being used for the connection. This means that you can use either a straight-through cable or cross-over cable to connect the EDS to Ethernet devices.

Dual Speed Functionality and Switching

The Moxa EtherDevice Switch's 10/100 Mbps switched RJ45 port auto negotiates with the connected device for the fastest data transmission rate supported by both devices. All models of Moxa EtherDevice Switch are plug-and-play devices, so that software configuration is not required at installation, or during maintenance. The half/full duplex mode for the switched RJ45 ports is user dependent and changes (by auto-negotiation) to full or half duplex, depending on which transmission speed is supported by the attached device.

Switching, Filtering, and Forwarding

Each time a packet arrives at one of the switched ports, a decision is made to either filter or forward the packet. Packets with source and destination addresses belonging to the same port segment will be filtered, constraining those packets to one port, and relieving the rest of the network from the need to process them. A packet with destination address on another port segment will be forwarded to the appropriate port, and will not be sent to ports where it is not needed. Packets that are used in maintaining the operation of the network (such as the occasional multi-cast packet) are forwarded to all ports. The EDS operates in the store-and-forward switching mode, which eliminates bad packets and enables peak performance to be achieved when there is heavy traffic on the network.

Switching and Address Learning

The EDS has an address table that can hold up to 1024 addresses, which makes it suitable for use with large networks. The address tables are self-learning, so that as nodes are added or removed, or moved from one segment to another, the EDS automatically keeps up with new node locations. An address-aging algorithm causes the least-used addresses to be deleted in favor of newer, more frequently used addresses. To reset the address buffer, power down the unit and then power it back up.

Auto-Negotiation and Speed Sensing

All of the EDS's RJ45 Ethernet ports independently support auto-negotiation for speeds in the 10BaseT and 100BaseTX modes, with operation according to the IEEE 802.3u standard. This means that some nodes could be operating at 10 Mbps, while at the same time, other nodes are operating at 100 Mbps. Auto-negotiation takes place when an RJ45 cable connection is made, and then each time a LINK is enabled. The EDS advertises its capability for using either 10 Mbps or

100 Mbps transmission speeds, with the device at the other end of the cable expected to advertise in a similar manner. Depending on what type of device is connected, this will result in agreement to operate at a speed of either 10 Mbps or 100 Mbps. If an EDS RJ45 Ethernet port is connected to a non-negotiating device, it will default to 10 Mbps speed and half-duplex mode, as required by the IEEE 802.3u standard.

Specifications

Technology	
Standards	IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X) and 100BaseFX, IEEE 802.3x for Flow Control
Processing Type	Store and Forward
Flow Control	IEEE 802.3x flow control, back pressure flow control
Interface	
RJ45 Ports	10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Ports	100BaseFX ports (SC/ST connector, multi/single-mode)
LED Indicators	P1, P2 (Power), 10/100M (TP port), and 100M (Fiber port)
DIP Switch	enable/disable broadcast storm protection

Optical Fiber

		100Base FX		
		Multi-mode		Single-mode 40 km
Fiber Cable Type		OM1	50/125 μm	G.652
			800 MHz*Km	
Typical Distance		4 km	5 km	40 km
Wavelength	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting 40 km single-mode fiber over a short distance, we recommend putting an attenuator to prevent the transceiver from being damaged by excessive optical power.

Typical Distance: To reach the typical distance of a specified fiber transceiver, please refer to the following formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).

Power	
Input Voltage	12/24/48 VDC (9.6 to 60 VDC)
Input Current @ 24 VDC	0.1 A (EDS-205A) 0.11 A (EDS-205A-M/S) 0.07 A (EDS-208A) 0.1 A (EDS-208A-M)

	0.11 A (EDS-208A-S) 0.14 A (EDS-208A-MM) 0.15 A (EDS-208A-SS)
Rated Supply Voltage and Current	12/24/48 V DC. Maximum 0.25 A, Class2 (For EDS-205A Series only)
Connection	Removable 4-contact terminal block
Inrush current	EDS-205A: Max. 6.24A @ 24VDC (0.1 - 1ms) EDS-208A: Max. 8.81A @ 24VDC (0.1 - 1ms)
Overload Current Protection	Present
Reverse Polarity Protection	Present
Physical Characteristics	
Housing	IP30 protection, metal case
Dimensions	EDS-208A Series: 50 x 114 x 70 mm EDS-205A: 30 x 115 x 70 mm
Weight	EDS-208A Series: 275 g EDS-205A: 175 g
Installation	DIN-Rail Mounting, Wall Mounting (with optional kit)
Environmental Limits	
Operating Temperature	-10 to 60°C (14 to 140°F) -40 to 75°C (-40 to 167°F) for -T models
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Regulatory Approvals	
Safety	UL508
Hazardous Location	UL/cUL Class I, Division 2, Groups A, B, C, and D; ATEX Zone 2, Ex nA IIC T4 Gc IECEx (For EDS-205A Series only): IECEx UL 14.0085X IEC 60079-0:2011 Ed.6 IEC 60079-15:2010 Ed.4
Maritime	EDS-205A: DNV, GL, ABS, LR, NK EDS-208A: IEC 60945, pending: DNV, GL, ABS, LR, NK
Rail Traffic	EN 50121-4
EMI	FCC Part 15, CISPR (EN 55032) class A
EMS	EN 61000-4-2 (ESD), Level 3 EN 61000-4-3 (RS), Level 3 EN 61000-4-4 (EFT), Level 3 EN 61000-4-5 (Surge), Level 3 EN 61000-4-6 (CS), Level 3 EN 61000-4-8
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6
Warranty	5 years
Address of Manufacturer	No. 1111, Heping Rd., Bade Dist., Taoyuan City 334004, Taiwan

WARNING

This equipment is intended to be used in a Restricted Access Location.

WARNING: HOT SURFACE!! Before touching it, special attention or protection is required.