



COMMANDO LightningFIBER 25GBASE-SR SFP-SR-25G Data Sheet



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Product Overview

COMMANDO LightningFIBER SFP-SR-25G, SFP28 (Small Form-factor Pluggable Twenty Eight) operates at 850nm is on multi-mode fiber transceiver based on 25G Ethernet IEEE 802.3by standard and compliant with FC-PI-6, SFF-8402、SFF-8419, SFF-8432 and SFF-8472, providing a fast and reliable interface for 25G Ethernet applications. The product implements Digital Diagnostics Monitoring (DDM) via a 2-wire serial bus, compliant with the SFF-8472 standard.

The module is designed to offer multi-vendor compatibility offering users flexibility, scalability without incurring additional overhead and increasing interoperability.

COMMANDO SFP28 transceiver module is for transmission at 850nm over Multimode fiber. The SFP28 transceiver is featured with low-power, high-density, high-speed and offers an efficient way to help your IT infrastructure to be quickly scaled up and ready for up to 25Gbps transmission. It supports distances up to 70m on OM3 or 100m OM4 fiber on MMF via an LC duplex connector. It offers customers a wide variety of 25Gbps connectivity to multi-vendor equipment like routers, switches, server, NICs of data center, enterprise wiring closet, and service provider transport applications. It is ideal for Internet Service Provider (ISP) Gigabit Ethernet communication links, Enterprise LAN & SAN Networks, Data Center LAN & SAN networks, and other optical links. It can be used as uplinks for 25Gbps Small Form-Factor Pluggable Twenty eight (SFP28) Fiber Network Module for delivering robust performance and Cloud networking needs of growing businesses, data centers and high-end campus networks.

Product Highlights

- Multi-vendor platform compatible
- Supports Up to 25.78Gbps bi-directional data links
- Hot-pluggable SFP28 footprint
- 850nm VCSEL laser transmitter
- Duplex LC connector
- Compliant with Compatible IEEE 802.3by, 25GBASE-SR
- Compliant with FC-P1-6, SFF-8402, SFF-8419, SFF-8432 and SFF-8472
- Built-in Digital Diagnostic Monitoring (DDM) functions
- Up to 70m on OM3 MMF
- Up to 100m on OM4 MMF
- Low power consumption (Module work consumption <1W)
- Single power supply 3.3V
- RoHS-6 Compliant
- Class 1 laser product complies with EN 60825-1
- Clock data recovery on transmit and receive channels CDR
- Operating temperature range (Case Temperature): 0°C to 70°C
- Applications: 25GBASE-SR Ethernet, 25G Fiber Channel, eCPRI Wireless Networks
- Standard and compact size, fully metallic enclosure for Low EMI

Features and Benefits

Easy to Use

COMMANDO SFP28 Transceivers are easy to use with simple and hassle-free setup. Its compact and standard size makes it ideal for all top brand devices along with COMMANDO products. Easy Installation, Plug-and-play installation with no configuration required.

25 Gigabit speed with Reliable performance

It provides and offers 25Gbps speed. These SFP28 are well built and rigorously tested and can sustain in very rough environment to provide reliable performance.

Dust proof Enclosure

It has a resilient dust proof enclosure protects against harsh outdoor condition with no ingress of dust.

Support uninterrupted critical network infrastructure

It is protected from any hardware failures with Extra Long operational life. With this feature protect on cost and the impact to your business by losing these network devices and thus the users/servers connected to them.

Cost Efficient

State of art quality product that can serve with world's top brand products along with COMMANDO devices on real time high-speed Performance, highly reliable, conformance to international open standards, durable, serviceable, aesthetics, perceived quality, enhanced performance leads to value to money.

Green Technology

It automatically adjusts power consumption according to the link status to limit the carbon footprint of your network. It also complies with RoHS-6, prohibiting the use of certain hazardous materials. Moreover, most of the packaging material can be recycled and reused.

Hardware

High Performance

- Low power consumption <1W typically, saving power
- 100us typical latency, MTBF over 1 million hours
- SFP28 Multi source Agreement (MSA) Compliant
- Input Voltage: 3.1V DC to 3.5V DC Maximum / 3.3V DC Typical.
- Input Current 300mA Maximum / 200mA Typical.

Extra Long operational life

- Stainless steel material
- Anti-corrosion and salt spray resistance
- Storage Relative Humidity: 5% to 95%
- Exceptional Performance in Harsh Outdoor Climates with dust proof enclosure ensuring it can withstand harsh outdoor and indoor environments.

Operating temperature range

- Commercial temperature range: 0 to 70°C (32 to 158°F)
- COMMANDO Extended temperature range: -5°C to 85°C (23 to 185°F)
- Storage temperature range: -40 to 85°C (-40 to 185°F)

Table 1 COMMANDO SFP28 Hardware Specifications Comparison

| Product Code | Form Factor | Maximum Speed | IEEE Standard Compliance | Connector Type | TX Power (dBm) | Receiver Sensitivity (dBm) |
|---------------|-----------------|---------------|--------------------------|-----------------|----------------|----------------------------|
| SFP-SM-1G | SFP | 1000Mbps | 1000BASE-LX/LH | LC duplex | -9.5 ~ -3dBm | < -23dBm |
| SFP-MM-1G | SFP | 1000Mbps | 1000BASE-SX | LC duplex | -9.5 ~ -3dBm | < -17dBm |
| SFP-UTP-1G | GBIC-T, SFP | 1000Mbps | 1000BASE-T | RJ-45 | Standard | <1W |
| SFP-SR-10G | SFP+ | 10.3125Gbps | 10GBASE-SR | LC Duplex | -7.3~-1dBm | < -11.1dBm |
| SFP-LR-10G | SFP+ | 10.3125Gbps | 10GBASE-LR | LC Duplex | -8.2~-0.5dBm | <-14.4dBm |
| SFP-ER-10G | SFP+ | 10.3125Gbps | 10GBASE-ER | LC Duplex | -7.3~-1dBm | < -11.1dBm |
| SFP-ZR-10G | SFP+ | 11.3Gbps | 10GBASE-ZR | LC Duplex | 0~5dBm | <-23dBm |
| SFP-UTP-10G | 10GBASE-T, SFP+ | 10Gbps | 10GBASE-T | Copper CAT 6a/7 | Standard | <1W |
| SFP-SR-25G | SFP28 | 25.78Gbps | 25GBASE-SR | LC Duplex | -9.40 --3.40 | -10.3dBm |
| SFP-LR-25G | SFP28 | 26.5Gbps | 25GBASE-LR | LC Duplex | -7.97--2.8 | 14.4/-13.3dBm |
| QSFP-SR4-40G | QSFP+ | 41.2Gbps | 40GBASE-SR4 | MTP/MPO-12 Male | -7.6~1dBm | <-11.1dBm |
| QSFP-LR4-40G | QSFP+ | 44.6Gbps | 40GBASE-LR4 | LC duplex | -7~2.3dBm | <-11.5dBm |
| QSFP-SR4-100G | QSFP28 | 103.1 Gbps | 100GBASE-SR4 | MTP/MPO-12 | -8.4~2.4dBm | <-10.3dBm |
| QSFP-LR4-100G | QSFP28 | 103.125Gbps | 100GBASE-LR4 | LC duplex | -4.3~4.5dBm | <-10.6dBm |

Specifications

COMMANDO SFP-SR-25G, SFP28 is used for speed 25Gbps Ethernet fiber speed and It is a compact, hot-swappable device that plugs into a physical port of a network device. SFP28 optics are used in communication networks and have a transmitting side (Tx) and a receiving side (Rx) work with 850nm wavelengths & supports up to 100m link lengths over OM4 MMF (70m over OM3 MMF) via an LC duplex connector.

Table 2. COMMANDO SFP Model Comparison

| Product Code | Center Wavelength (nm) | Media Type | Max Transmission Distance | Digital Diagnostics Monitoring Supported |
|--------------|------------------------|--------------------|---------------------------|--|
| SFP-SM-1G | GBIC-LX/LH, 1310nm | MMF/SMF | 550m/20km | DDM |
| SFP-MM-1G | GBIC-SX, 850nm | MMF | 550m | DDM |
| SFP-UTP-1G | GBIC-T, RJ-45 | Copper | 100m | Standard |
| SFP-SR-10G | 10GBASE-SR, 850nm | MMF | 300m | DDM |
| SFP-LR-10G | 10GBASE-LR, 1310nm | SMF | 20km | DDM |
| SFP-ER-10G | 10GBASE-ER, 1550nm | SMF | 40km | DDM |
| SFP-ZR-10G | 10GBASE-ZR/ZW, 1550nm | SMF | 80km | DDM |
| SFP-UTP-10G | 10GBASE-T RJ-45 | Copper CAT 6a/7 | 80m | Standard |
| SFP-SR-25G | 25GBASE-SR, 850nm | MMF | 70/100m | DDM |

| | | | | |
|----------------------|-------------------------------|-----------------|------|-----|
| SFP-LR-25G | 10GBASE-LR/25GBASE-LR, 1310nm | SMF | 10km | DDM |
| QSFP-SR4-40G | 40GBASE-SR4, 850nm | MMF | 100m | DDM |
| QSFP-LR4-40G | 40GBASE-LR4, 1310nm | SMF | 10km | DDM |
| QSFP-SR4-100G | 100GBASE-SR4, 850nm | MTP/MPO-12, MMF | 100m | DDM |
| QSFP-LR4-100G | 100GBASE-LR4, 1310nm | LC Duplex, SMF | 10km | DDM |

General Specifications

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|--------|-----|-------|--------------------|------|---------|
| Data rate | DR | - | 25.78 | | Gbps | 1 |
| Bit error rate | BER | - | - | 5×10^{-5} | - | 2 |
| OM3 multimode fiber (bandwidth 2000MHz*km) | L | - | - | 70 | M | 3 |
| OM4 multimode fiber (bandwidth 4700MHz*km) | L | - | - | 100 | M | 3 |

Notes:

1. IEEE802.3by
2. Measured with data rate at 25.78Gbps, PRBS $2^{31}-1$
3. This module requires RS-FEC on the host ports for operation at 25G

Link Distances

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|--|--------|-----|-------|--------------------|------|---------|
| Data rate | DR | - | 25.78 | - | Gbps | 1 |
| Bit error rate | BER | - | - | 5×10^{-5} | - | 2 |
| OM3 multimode fiber (bandwidth 2000MHz*km) | L | - | - | 70 | M | 3 |
| OM4 multimode fiber (bandwidth 4700MHz*km) | L | - | - | 100 | M | 3 |

Optical – Characteristics – Transmitter

$V_{CC}=3.15V$ to $3.46V$, $T_C=0^{\circ}C$ to $70^{\circ}C$

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|-----------------------------------|-----------------|------|-----|-----|------|---------|
| Average Output Optical Power | PTX | -8.4 | - | 2.4 | dBm | - |
| Optical Center Wavelength | λ_c | 840 | 850 | 860 | nm | - |
| Optical Modulation Amplitude | OMA | -6.4 | - | 3 | dBm | - |
| Extinction Ratio | ER | 2 | - | - | dB | - |
| Spectral Width (RMS) | $\Delta\lambda$ | - | - | 0.6 | nm | - |
| Transmitter Dispersion Eye Closed | TDEC | - | - | 4.3 | dB | - |

Optical – Characteristics – Receiver

$V_{CC}=3.15V$ to $3.46V$, $T_C=0^{\circ}C$ to $70^{\circ}C$

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---------------------------|-------------|-----|-----|-----|------|---------|
| Optical Center Wavelength | λ_c | 840 | 850 | 860 | nm | - |

| | | | | | | |
|---------------------|------------------|-------|---|-----|-----|---|
| Receive Sensitivity | PRX | -10.3 | - | 3 | dBm | 1 |
| Optical Return Loss | ORL | 12 | - | - | dB | - |
| LOS Assert | LOS _A | -30 | - | - | dBm | - |
| LOS De-Assert | LOS _D | - | - | -11 | dBm | - |
| LOS Hysteresis | LOS _H | 0.5 | - | - | dB | - |

Note:

1. Average, measured with data rate at 25.78Gbps, PRBS 2³¹-1, BER 5x10⁻⁵, without fiber

Electrical – Characteristics – Transmitter

V_{CC}=3.15V to 3.46V, T_C=0°C to 70°C

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|-------------------------------|--------------------|-----------------|-----|----------------------|------|---------|
| Input differential impedance | R _{IN} | - | 100 | | Ω | - |
| Differential data input swing | V _{IN} PP | 180 | - | 1600 | mV | - |
| Transmit Disable Voltage | V _D | 2 | - | V _{CC} | V | - |
| Transmit Enable Voltage | V _{EN} | V _{EE} | - | V _{EE} +0.8 | V | - |

Electrical – Characteristics – Receiver

V_{CC}=3.15V to 3.46V, T_C=0°C to 70°C

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---------------------------|---------------------|-----------------|-----|-------------------------|------|---------|
| Differential output swing | V _{OUT} PP | 370 | 600 | 850 | mV | - |
| LOS Assert | LOS _A | 2 | - | V _{CC} HOST | V | - |
| LOS De-Assert | LOS _D | V _{EE} | - | V _{EE} +0.8 | V | - |

Digital Diagnostic Monitor (DDM) Functions

COMMANDO SFP-SR-25G supports the 2-wire serial communication protocol defined in SFF-8472, which accesses digital diagnostic information through a 2-wire interface with the address 0xA2. The digital diagnosis defaults to internal calibration, and the internal micro-control unit accesses the module operating parameters in real time, such as module temperature, laser bias current, emission power, received light power and module power supply voltage. The module realizes the alarm function of SFF-8472, which sets the alarm flag bit when the specific working parameters are out of the normal range and cancels the alarm flag bit when the specific working parameters return to the normal range.

DDM Threshold Information

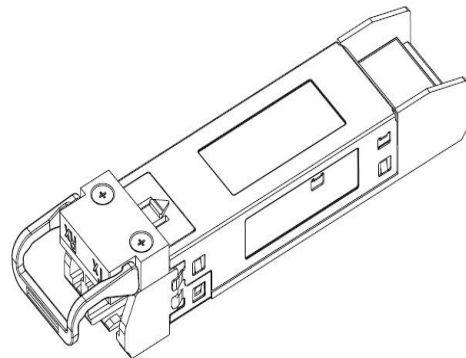
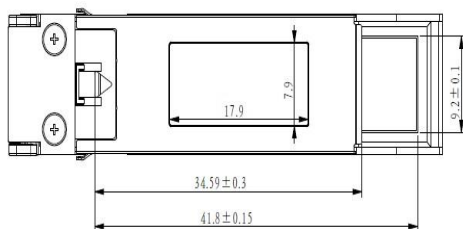
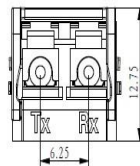
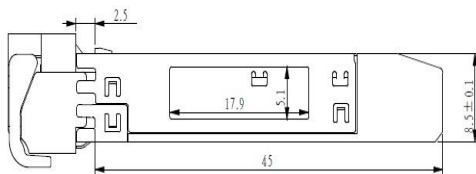
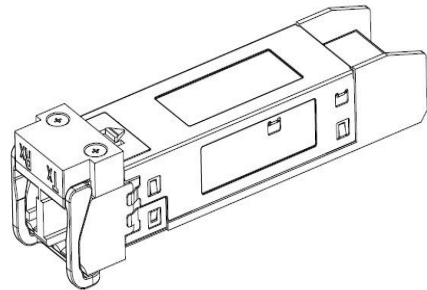
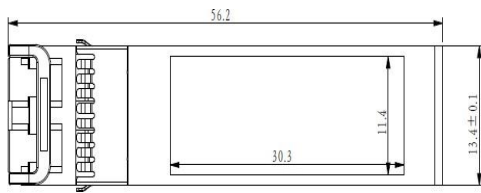
| Parameter | High Alarm | High Warning | Low Warning | Low Alarm |
|------------------|--------------|--------------|--------------|--------------|
| Temperature(°C) | 75.00(4B00h) | 70.00(4600h) | 0.00(0000h) | -5.0(FB00h) |
| Voltage(V) | 3.63(8DCCh) | 3.46(8728h) | 3.13(7A44h) | 2.97(7404h) |
| Bias Current(mA) | 12.00(1770h) | 11.50(1676h) | 2.00(03E8h) | 1.00(01F4h) |
| Tx Power(dBm) | 3.40(5575h) | 2.40(43E2h) | -8.4(05A5h) | -9.4(047Ch) |
| Rx Power(dBm) | 3.40(5575h) | 2.40(43E2h) | -10.3(03A5h) | -11.3(02E5h) |

Product Weight

Module Weight : 16.0 g Dust

Cap Weight : 0.95 g

Dimensions



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED UNIT: mm

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Included in the bundle/box

All COMMANDO SFP-SR-25G, SFP28 Transceivers are made available for use globally along with accessory used to facilitate or enhance operations. COMMANDO SFP-SR-25G, SFP28 Transceivers comes with following Accessories.

1x (COMMANDO 25G SFP28 Transceiver Module) SFP-SR-25G

Support and Warranty

- Same-day assistance.
- Comprehensive 24-hour support using common communication/chat platforms, Email and Telephone.
- Provide FAQs and troubleshooting help online (self-service) through cloud-based solutions.
- Highly technical and trained representatives to resolve issues.
- One-year default warranty with option of warranty extension up to 3 years

Table 3. Support and Warranty

| Warranty and Support | |
|-----------------------------|---|
| Products covered | COMMANDO LightningFIBER 25GBASE-SR, SFP28, 850nm, 70/100m, MMF, DDM (SFP-SR-25G) |
| Warranty duration | One Year RTB (Return To Base) replacement warranty – optionally extendable up to 3 years. |
| Hardware replacement | COMMANDO, its resellers, or its service center will use commercially reasonable efforts to replace the product subject to stock availability. Otherwise, a replacement will be arranged within 15 working days after receipt of the Return Materials Authorization (RMA) request. |
| End-of-life policy | In case of discontinuation of the product, support is limited to 3 years from announcement date. |
| Effective date | Hardware warranty commences from the date of shipment to customer (and in case of resale by a COMMANDO reseller, not more than 90 days after original shipment by COMMANDO). |
| Support duration | Lifetime support. |
| COMMANDO Care | COMMANDO will provide 24x7 support for basic configuration, diagnosis, and troubleshooting of device-level problems for up to one year from the date of shipment of the originally purchased product. This support does not include solution or network-level support beyond the specific device under consideration. |
| Online Portal Access | Warranty allows guest access to commandonetworks.com for all available technical queries. |

Ordering Information

Ordering information for the COMMANDO SFP-SR-25G, SFP+ Transceivers, To place an order, please contact your local reseller/distributor or COMMANDO Sales Representative at www.commandonetworks.com/rfq

Table 4. Ordering Information

| Product Code | Description |
|----------------------|--|
| SFP-SM-1G | COMMANDO LightningFIBER 1000BASE-LX/LH, SFP, 1310nm, 20km, SMF, DDM |
| SFP-MM-1G | COMMANDO LightningFIBER 1000BASE-SX, SFP, 850nm, 550m, MMF, DDM |
| SFP-UTP-1G | COMMANDO LightningCOPPER 1000BASE-T SFP, Copper, RJ-45, 100m, Standard |
| SFP-SR-10G | COMMANDO LightningFIBER 10GBASE-SR, SFP+, 850nm, 300m, MMF, DDM |
| SFP-LR-10G | COMMANDO LightningFIBER 10GBASE-LR, SFP+, 1310nm, 20km, SMF, DDM |
| SFP-ER-10G | COMMANDO LightningFIBER 10GBASE-ER, SFP+, 1550nm, 40km, SMF, DDM |
| SFP-ZR-10G | COMMANDO LightningFIBER 10GBASE-ZR/ZW, SFP+, 1550nm, 80km, SMF, DDM |
| SFP-UTP-10G | COMMANDO LightningCOPPER 10GBASE-T Copper RJ-45, SFP+, Up to 80m, CAT 6a/7 |
| SFP-SR-25G | COMMANDO LightningFIBER 25GBASE-SR, SFP28, 850nm, 70/100m, OM3/4 MMF, DDM, Multi-vendor Compatible |
| SFP-LR-25G | COMMANDO LightningFIBER 10/25GBASE-LR, SFP28, 1310nm, 10km, SMF, DDM, Multi-vendor Compatible |
| QSFP-SR4-40G | COMMANDO LightningFIBER 40GBASE-SR4, QSFP+, 850nm, 100m, MMF, DDM |
| QSFP-LR4-40G | COMMANDO LightningFIBER 40GBASE-LR4, QSFP+, 1310nm, 10km, SMF, DDM |
| QSFP-SR4-100G | COMMANDO LightningFIBER 100GBASE-SR4, QSFP28+, 850nm, 100m, MTP/MPO-12, MMF, DDM |
| QSFP-LR4-100G | COMMANDO LightningFIBER 100GBASE-LR4, QSFP28+, 1310nm, 10km, SMF, DDM |

Document History

| Release | What's new | Date |
|-----------|-------------------------------------|--------------------|
| Release 1 | First Release | March 24, 2021 |
| Release 2 | Multi-brand compatible model launch | November 9, 2022 |
| Release 3 | Model adjustment | September 18, 2023 |
| Release 4 | 25G Model added | October 13, 2023 |