



COMMANDO LightningCOPPER 1000BASE-T SFP-UTP-1G Data Sheet



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Product Overview

COMMANDO LightningCOPPER SFP-UTP-1G is a 1.25 Gigabit Ethernet 1000BASE-T SFP (Small Form Pluggable) Copper Transceiver, hot-swappable RJ45 electrical port module, compliant with Gigabit Ethernet standards and SFP Multi-Source Agreement (MSA) standards, supporting 10M/100M/1000M transmission rate. CAT5 class network cable transmission distance of up to 100 meters, good electromagnetic compatibility, compatible with various brands of hosts, widely used in data centers and enterprise networks.

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

It is compliant to IEEE 802.3i, 802.3u and 802.3ab Gigabit Ethernet standards which make it ideally suited for data communications. It supports distances up to 100meters. It offers customers copper-based Gigabit Ethernet connectivity to multi-vendor equipment's 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 copper-based links. It can be used as uplinks for 1 Gigabit Ethernet Small Form-Factor Pluggable (SFP) for Copper 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 1.25Gb/s bi-directional data links
- Data transmission distance up to 100m
- Hot-pluggable SFP to maximize uptime and simplify serviceability
- Compliant with IEEE 802.3i, IEEE 802.3u, IEEE 802.3ab
- Support 10/100/1000BASE-T operation in host systems with SGMII interface
- Auto-sense MDI/MDIX
- RJ-45 Connector
- Built-in Digital Diagnostic Monitoring (DDM) functions
- Single power supply 3.3V and TTL Logic Interface
- Standard and compact size, fully metallic enclosure for Low EMI
- Low Power Dissipation (1.05W Typical)
- Compliant with SFP MSA
- RoHS Compliant
- Operating temperature range: 0°C to 70°C
- Applications: 1.25 Gigabit Ethernet

Features and Benefits

Easy to Use

COMMANDO transceiver module supports copper distance up to 100m i.e., link lengths over a copper connection via a RJ-45 connector. It is easy to use with a 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.

1 Gigabit speed with Reliable performance

It provides and offers 1G speed with backward compatibility. These SFP 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, 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
- SFP Multi source Agreement (MSA) Compliant

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)
- Storage temperature range: -40 to 85°C (-40 to 185°F)

Table 1 COMMANDO LightningCOPPER SFP 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-UTP-1G, SFP is used for speed 1 Gigabit Ethernet copper speed up to 100m and It is a compact, hot-swappable device that plugs into a physical port of a network device.

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 | 10 | - | 1000 | Mb/sec | 1 |
| Cable Length | CL | - | - | 100 | m | 2 |
| Bit Error Rate | BER | - | - | 10 ⁻¹² | - | - |
| Storage Temperature | TSTO | -40 | - | 85 | °C | 3 |
| Supply Current | ICC | - | 370 | 420 | mA | - |
| Input Voltage | VCC | 3.14 | 3.3 | 3.46 | V | - |
| Maximum Voltage | VMAX | - | - | 4 | V | - |
| Power Consumption | P | - | 1.22 | 1.38 | W | - |

Notes:

1. IEEE 802.3i, IEEE 802.3u, IEEE 802.3ab compatible
2. Category 5 UTP
3. Ambient temperature

High Speed Electrical Interface Host-SFP

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|--------------------------------|--------------------------------|-----|-----|------|------|---------|
| Single ended Input swing | V _{IN PP} | 250 | - | 1200 | mV | - |
| Single ended output swing | V _{OUT PP} | 275 | - | 800 | mV | - |
| Rise Time /Fall Time (20%-80%) | t _r /t _f | - | 175 | - | ps | - |
| Tx Input impedance | Z _{IN} | - | 50 | - | ohm | 1 |
| Rx Output impedance | Z _{OUT} | - | 50 | - | ohm | 1 |

Notes:

1. Single ended

High Speed Electrical Interface Transmission Line-SFP

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|----------------------------------|---------------------|-----|-----|-----|------|---------|
| Line Frequency | F _L | - | 125 | - | MHz | 1 |
| Tx Output Impedance Differential | Z _{OUT TX} | - | 100 | - | Ohm | 2 |
| Rx Input Impedance Differential | Z _{IN RX} | - | 100 | - | Ohm | 2 |

Notes:

1. 5-level encoding
2. For all frequencies between 1MHz and 125MHz

Low Speed Electrical Signal

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|-----------------|--------|---------------------------|-----|---------------------------|------|---------|
| SFP Output Low | VOL | 0 | - | 0.5 | V | 1 |
| SFP Output High | VOH | Host_V _{CC} -0.5 | - | Host_V _{CC} +0.3 | V | 1 |
| SFP Input Low | VIL | 0 | - | 0.8 | V | 1 |
| SFP Input High | VIH | 2 | - | V _{CC} +0.3 | V | 1 |

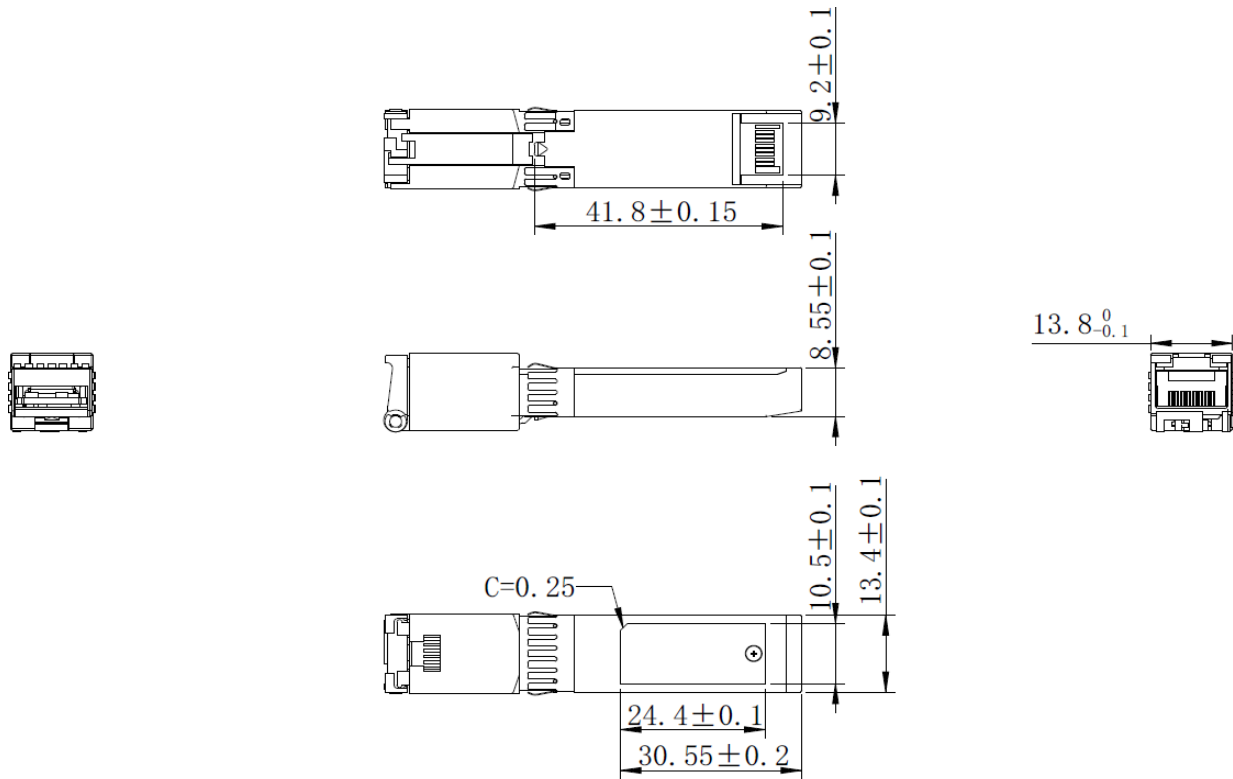
Notes:

1. External 4.7-10k ohm pull-up resistor required

Product Weight

Weight: 24.5g

Dimensions:



All dimensions are ± 0.2 mm unless specified otherwise

Unit: mm

Included in the bundle/box

All COMMANDO LightningCOPPER 1000BASE-T SFP-UTP-1G, SFP made available for use globally along with accessory used to facilitate or enhance operations. All COMMANDO SFP-UTP-1G, SFP Transceivers Comes with following Accessories.

1x (COMMANDO 1G UTP Transceiver Module) SFP-UTP-1G

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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

COMMANDO WarrantyX Program available on: www.commandonetworks.com/warranty

Table 3. Support and Warranty

| Warranty and Support | |
|-----------------------------|---|
| Products covered | COMMANDO LightningCOPPER 1000BASE-T SFP, Copper, RJ-45, 100m, Standard (SFP-UTP-1G) |
| 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 LightningCOPPER SFP-UTP-1G, SFP, to place an order, please contact your local reseller/distributor or COMMANDO Sales Representative at

www.commandonetworks.com/catalog

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 |