10GBASE-T Copper Transceiver

10Gtek's 10GBASE-T SFP+ copper module is a high performance integrated duplex data link for bi-directional communication over copper cable. It is specifically designed for high speed communication links that require 10 Gigabit Ethernet over Cat 6/6a/7 cable with a link of 30meters. The benefit is that it uses standard-based technology with the familiar RJ45 connector and provides backward compatibility with legacy networks.

The 10GBASE-T SFP+ copper transceiver is expanding the application of the copper based technology. Before, the direct attach cables with the limitation of reach distance is 10 meters, even the active version only could up to 15 meters. However, the 10GBASE-T SFP+ Copper Transceiver can transfer over distances of 30 meters with 10GE data, over Cat 6/6a/7 cable. Though at present the Cat 6/6a/7 cabling provides limited support for 10GBASE-T in some environments, the compelling features of this 10GBASE-T SFP+ copper transceiver make it a favorable choice for long-term consideration. This module has the benefits of backwards compatible and usable for nearly every copper infrastructure, full PHY (physical layer) presentation, and cost-effective for today and future applications.

With platform advancements bringing down the price and power consumption for 10GBASE-T switches, there are a lot of affordable switches entering the market from various manufacturers. This is why 10Gtek made this compatible product, as a leader in the small form pluggable (SFP+) transceiver compatible market.

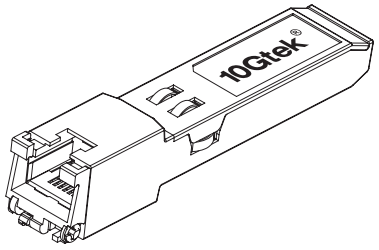
Features

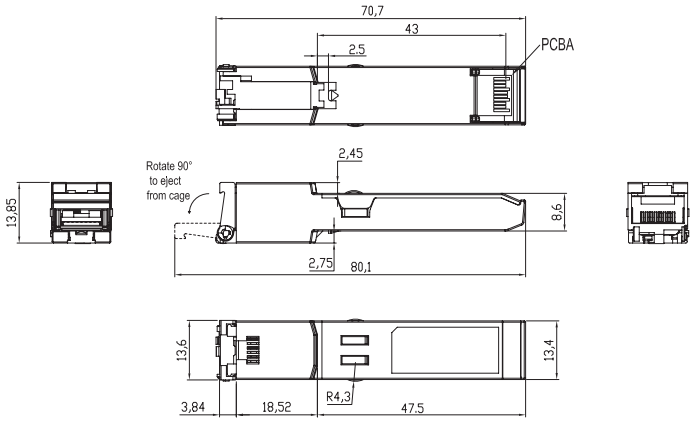
- Supports Links up to 30m using Cat 6/6a/7 Cable
- Compliant with IEEE 802.3az
- Compliant with SFF-8431 and SFF-8432 MSA
- Low Power Consumption (2.5W MAX @ 30m)
- Auto-negotiates with other 10GBase-T PHYs
- I2C 2-Wire Interface for Serial ID and PHY Register Access
- Auto-sense MDI/MDIX
- RoHS Compliance
- Operating temperature range: 0°C to 70°C

Applications

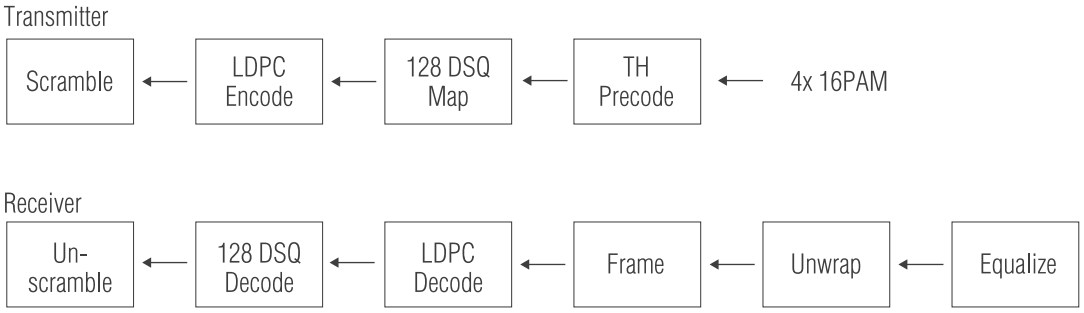
- 10 Gigabit Ethernet

10GBASE-T Block Diagram





The 10GBASE-T PHY component consists of 10GBASE-T PCS, 10GBASE-T PMA, 10GBASE-T AN and 10GBASE-T MDI. The PCS sublayer uses LDPC forward error correction and multi-bit PAM16 coding. PMA sub-layer achieves 4 bundles send and receive functions in the same time on the 8-core 4-wire Cat6A twisted pair cable. AN function extends auto-negotiation to 10Gb. MDI interface using extended Category 6 RJ45 connector, high-performance extension Category 6 line can transmit 100m distance.



- Self-synchronizing scrambler provides clock transitions, and a statistically random power spectrum for EMI control, equalizer convergence, etc.
- DSQ 128 coding: The 10GBASE-T standard uses a synthetic 2-dimensional 128 DSQ (Double SQuare) constellation, which conveys 7 bits per symbol.
- LDPC (Low Density Parity Check) block codes: Block codes are one of two kinds of error correcting codes that can be used to approach the Shannon capacity of a channel.
- Tomlinson-Harashima Precoding (THP): The 10GBASE-T standard calls for the use of THP, which is a scheme in which the equalizer for the channel is placed in the transmitter theoretically allowing the receiver to see “perfect” symbols. Training is accomplished during the initialization phase of the link.

Ordering Information

Part Number	Description	Data Rate	Reach	Connector/Cable
ASF-10G-T/M	10GBASE-T SFP+ copper module with Marvell PHY	10Gbps	30M	RJ-45 Cat.6A Cabling
ASF-10G-T/B	10GBASE-T SFP+ copper module with Broadcom PHY	10Gbps	30M	RJ-45 Cat.6A Cabling

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