

# SFP Fiber Optic Transceivers

## TTD4540, TTD4580-xx-PI 10.3125 Gbps SFP+ DWDM Optical Transceiver Module

### FEATURES

- Provides long-haul 10G Ethernet optical transmission up to 80 km
- Supports ARRIS Remote Phy Device (RPD) and Remote OLT (R-OLT) DAA Solutions
- 10.3125 Gbps data Transmit/Receive operation
- Hot Pluggable SFP+ MSA footprint
- Duplex LC connector
- Very low jitter
- Metal enclosure for low EMI and durability
- Low power dissipation
- Extended industrial operating temperature range



### PRODUCT OVERVIEW

TTD4540 and TTD4580 family of DWDM transceiver modules provide the optical high-speed data communication functions supported by ARRIS Distributed Access Architecture (DAA) products such as the E6000N Remote Phy Device (RPD) and the XE4202M Remote Optical Line Termination (R-OLT). These small and compact DWDM transceiver modules drive and receive 10G symmetrical Ethernet between the headend switch/routers and remote node/VHub platforms at distances up to 80 km, enabling gigabit data services to be available in rural and fast growing residential and commercial developments, supporting modern day communications needs without the expense of investing in new plant facilities.

Conforming to the Small Form Factor Pluggable (SFP+) Multisource Agreement, these state-of-the-art components are designed expressly for high-speed bi-directional communication applications that require 10 (10.3125) Gbps, with the laser transmission operating at one of 40 available ITU-T compliant (G.694.2) DWDM wavelengths (20–59).

The TTD4540/TTD4580 family of modules features a very low jitter contribution, resulting in extremely clean, high-quality eye patterns. The module's metal enclosure ensures rugged durability, but also improves FCC EMI test margins. This emission and ESD control is particularly important in applications with sensitive multiport hubs and switches. The modules, which dissipate less than 2.5 W, are supplied with a duplex LC connector.

## SPECIFICATIONS

Characteristics	Specification
<b>Physical</b>	
Dimensions	2.2" L x 0.45" H x 0.54" W (5.65 cm x 1.145 cm x 1.37 cm)
Weight	0.8 lbs (0.05 kg)
<b>Environmental</b>	
Operating temperature range	-40° to +95°C (-40° to +203°F)
Storage temperature range	-40° to +95°C (-40° to +203°F)
Humidity (Operating)	5% to 95% non-condensing
<b>Optical Interface</b>	
Optical connectors	Duplex LC
<b>Power requirements</b>	
Input voltage	3.3 V <sub>DC</sub> (Supplied by associated master module)
Power consumption (max)	2.3 W (TTD4540); 2.8 W (TTD4580)
<b>General</b>	
Data rate	10.3125 Gbps
Hot plug-in/out	
Supported Link Length TTD4580	80 km on SMF-28 or equivalent <sup>1</sup>
Supported Link Length TTD4540	40 km on SMF-28 or equivalent <sup>1</sup>
<b>Optical Interface: TTD4580</b>	
<b>Transmitter</b>	
Type	Cooled DWDM DFB
DWDM channels	40 channels (20 through 59) (Center wavelengths per ITU-T G.694.2)
Wavelength stability, EOL	± 0.1 nm
Output power	-1 dBm min over -40° to 95°C
Extinction ratio (ER)	8.2 dB min
Dispersion penalty	3.0 dB (Measured with PRBS 2 <sup>31</sup> -1 at 10.3125 Gbps, 80 km SMF, and 1x 10 <sup>-12</sup> BER)
<b>Receiver</b>	
Receiver sensitivity	-24 dBm, min over 1525 – 1565 nm
Wavelength range	1260 – 1620 nm
Input power	-6 dBm, max
Loss of signal assert level	-35 dBm, min
<b>Optical Interface: TTD4540</b>	
<b>Transmitter</b>	
Type	Cooled DWDM DFB
DWDM channels	40 channels (20 through 59) (Center wavelengths per ITU-T G.694.2)
Wavelength stability, EOL	± 0.1 nm
Output power	-2 dBm min over -40° to 95°C
Extinction ratio (ER)	8.2 dB min
Dispersion penalty	3.0 dB (Measured with PRBS 2 <sup>31</sup> -1 at 10.3125 Gbps, 80 km SMF, and 1x 10 <sup>-12</sup> BER)
<b>Receiver</b>	
Receiver sensitivity	-16.5 dBm, min over 1525 – 1565 nm
Wavelength range	1260 – 1620 nm
Input power	-1 dBm, max
Loss of signal assert level	-30 dBm, min
<b>Regulatory</b>	
	Class 1 devices per FDA/CDRH and IEC-60825-1 laser safety regulations

### NOTE:

1. This is strictly a dispersion limitation. Actual transmission distance is also dictated by the power budget of each transmission link. EDFAs and Dispersion Compensation Modules are suitable for use with these transceivers.

## ORDERING INFORMATION TTD4540

Model Name	Description
TTD4540-20-PI	10 Gbps, Ch 20, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-21-PI	10 Gbps, Ch 21, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-22-PI	10 Gbps, Ch 22, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-23-PI	10 Gbps, Ch 23, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-24-PI	10 Gbps, Ch 24, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-25-PI	10 Gbps, Ch 25, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-26-PI	10 Gbps, Ch 26, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-27-PI	10 Gbps, Ch 27, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-28-PI	10 Gbps, Ch 28, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-29-PI	10 Gbps, Ch 29, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-30-PI	10 Gbps, Ch 30, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-31-PI	10 Gbps, Ch 31, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-32-PI	10 Gbps, Ch 32, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-33-PI	10 Gbps, Ch 33, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-34-PI	10 Gbps, Ch 34, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-35-PI	10 Gbps, Ch 35, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-36-PI	10 Gbps, Ch 36, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-37-PI	10 Gbps, Ch 37, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-38-PI	10 Gbps, Ch 38, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-39-PI	10 Gbps, Ch 39, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-40-PI	10 Gbps, Ch 40, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-41-PI	10 Gbps, Ch 41, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-42-PI	10 Gbps, Ch 42, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-43-PI	10 Gbps, Ch 43, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-44-PI	10 Gbps, Ch 44, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-45-PI	10 Gbps, Ch 45, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-46-PI	10 Gbps, Ch 46, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-47-PI	10 Gbps, Ch 47, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-48-PI	10 Gbps, Ch 48, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-49-PI	10 Gbps, Ch 49, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-50-PI	10 Gbps, Ch 50, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-51-PI	10 Gbps, Ch 51, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-52-PI	10 Gbps, Ch 52, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-53-PI	10 Gbps, Ch 53, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-54-PI	10 Gbps, Ch 54, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-55-PI	10 Gbps, Ch 55, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-56-PI	10 Gbps, Ch 56, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-57-PI	10 Gbps, Ch 57, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-58-PI	10 Gbps, Ch 58, Duplex LC/UPC, 40 km, -40° to +95°C
TTD4540-59-PI	10 Gbps, Ch 59, Duplex LC/UPC, 40 km, -40° to +95°C

## ORDERING INFORMATION TTD4580

Model Name	Description
TTD4580-20-PI	10 Gbps, Ch 20, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-21-PI	10 Gbps, Ch 21, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-22-PI	10 Gbps, Ch 22, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-23-PI	10 Gbps, Ch 23, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-24-PI	10 Gbps, Ch 24, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-25-PI	10 Gbps, Ch 25, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-26-PI	10 Gbps, Ch 26, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-27-PI	10 Gbps, Ch 27, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-28-PI	10 Gbps, Ch 28, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-29-PI	10 Gbps, Ch 29, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-30-PI	10 Gbps, Ch 30, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-31-PI	10 Gbps, Ch 31, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-32-PI	10 Gbps, Ch 32, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-33-PI	10 Gbps, Ch 33, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-34-PI	10 Gbps, Ch 34, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-35-PI	10 Gbps, Ch 35, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-36-PI	10 Gbps, Ch 36, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-37-PI	10 Gbps, Ch 37, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-38-PI	10 Gbps, Ch 38, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-39-PI	10 Gbps, Ch 39, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-40-PI	10 Gbps, Ch 40, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-41-PI	10 Gbps, Ch 41, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-42-PI	10 Gbps, Ch 42, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-43-PI	10 Gbps, Ch 43, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-44-PI	10 Gbps, Ch 44, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-45-PI	10 Gbps, Ch 45, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-46-PI	10 Gbps, Ch 46, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-47-PI	10 Gbps, Ch 47, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-48-PI	10 Gbps, Ch 48, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-49-PI	10 Gbps, Ch 49, Duplex LC/UPC, 80 km, -40° to +95°C

## ORDERING INFORMATION TTD4580 CONTINUED

Model Name	Description
TTD4580-50-PI	10 Gbps, Ch 50, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-51-PI	10 Gbps, Ch 51, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-52-PI	10 Gbps, Ch 52, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-53-PI	10 Gbps, Ch 53, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-54-PI	10 Gbps, Ch 54, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-55-PI	10 Gbps, Ch 55, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-56-PI	10 Gbps, Ch 56, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-57-PI	10 Gbps, Ch 57, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-58-PI	10 Gbps, Ch 58, Duplex LC/UPC, 80 km, -40° to +95°C
TTD4580-59-PI	10 Gbps, Ch 59, Duplex LC/UPC, 80 km, -40° to +95°C

## RELATED PRODUCTS

E6000n Remote Phy	XE4202M Remote OLT
NC2000/NC4000 Node	NH/VH4000 VHub/UVHub

## Customer Care

Contact Customer Care for product information and sales:

- United States: 866-36-ARRIS
- International: +1-678-473-5656

**Note:** Specifications are subject to change without notice.

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