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DATASHEET

SFP/SFP+ Modules

General description

Technica Engineering's automotive SFP/SFP+ (Small Form-factor Pluggable) modules offer reliable, high-performance automotive Ethernet solutions for in-vehicle networks. The SFP/SFP+ modules lineup covers different speed rates ranging from 100Mbps/1Gbps to 10Gbps and covering all point-to-point automotive ethernet standards. Designed with H-MTD connectors, these modules ensure durability under and assure integration flexibility.

Application Areas

The lineup of Technica Engineering's automotive SFP/SFP+ modules offer a solution to convert between 100/1000BASE-T1 or 2.5/5/10GBASE-T1 Automotive Ethernet and a host high-speed electrical interface at 1Gbps or 10Gbps compliant with SFF-8431 standard for SFP/SFP+ modules The SFP Modules can be used with any type of hardware products offering suitable SFP slots to add Automotive Ethernet interfaces at different speeds. Their hot-swappable nature ensures minimal downtime during testing or production changes, making them essential in test benches, simulation environments, and automotive production networks.

In compliance with SFF-8472 standard, modules contain a memory map with device information at I2C address 0xA0, so system integrator can identify the TE-1441 or TE-1445 device and make any custom implementations on top of it.

The SFP Module can also be easily used together with other Technica Engineering products, like the Switch-based products. For example, it can be plugged into an Enhanced Ethernet Switch to add another 100/1000 Mbit/s Automotive Ethernet port.

Configuration and features

A key advantage of the SFP/SFP+ modules is the straightforward configuration they provide, with four DIP switches to define the default configurations at start-up time between different modes.

Multigigabit SFP+ Module:
DIP Switch 1: Master/Slave
DIP Switch 2: 10G/other
DIP Switch 3: 2.5G/5G
DIP Switch 4: Reserved

100/1000BASE-T1 SFP Module:
Dip switch 1: Master/Slave
Dip switch 2: 100/1000 Mbit/s
Dip switch 3: Reserved
Dip switch 4: Reserved

The modules also a include the key I2C-to-MDIO gateway feature, which enables advanced Ethernet PHY management by allowing access to the underlying PHY registers via the I2C bus. It also adds a custom implementation to change the DIP switches default status at run-time so system integrator can change dynamically between PHY configurations offered by Technica, overriding default configuration status set in the physical DIP switches, and without needing the register-level complete technical information from the PHY manufacturer*.

*Complete information about PHY MV-3244 in TE-1445 or PHY 88Q2221M in TE-1441 must be acquired under NDA directly from Marvell Technology
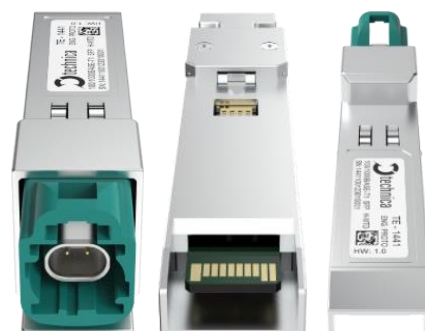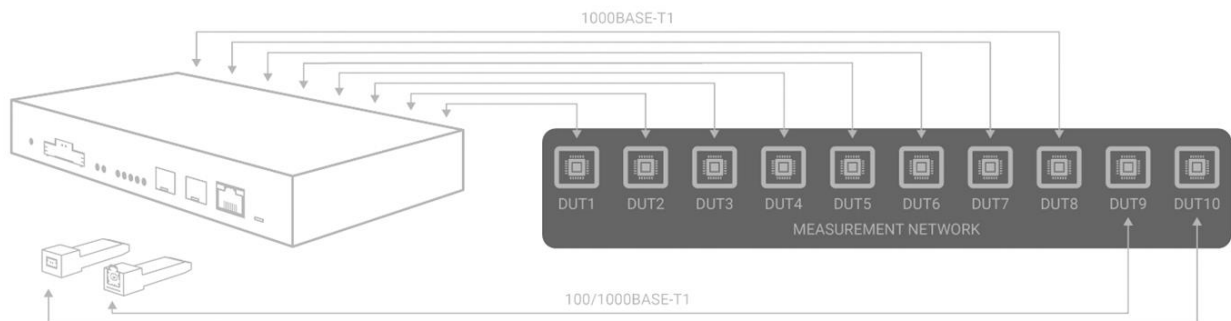

SFP/SFP+ Module

Technical Data

Operating Temperature	-40 °C to +85 °C
Supply Voltage	3.3 Volts DC +/- 0.03 Volts
Power consumption	Standard SFP Power Level 1 Module (<1W)
IP Protection Class	IP 20
Housing Dimensions	68 mm (W) x 14 mm (L) x 14 mm (H)
Weight	30 g
Connector	1x H-MTD

Characteristics of SFP Modules variants

		PT-1445	TE-1441
Conversion from TX to T1	100BASE-T1	-	✓
	1000BASE-T1	-	✓
	2.5GBASE-T1	✓	-
	5GBASE-T1	✓	-
	10GBASE-T1	✓	-
Connector	Automotive ethernet	H-MTD	H-MTD
Configuration method	DIP Switches	✓	✓
	DIP Switches overriding	✓	✓
	PHY registers configuration	✓	✓
Features	USXGMII mode	✓	-
	I2C to MDIO gateway	✓	✓
	Status LED	✓	✓
	TC10 support	-	✓
Transceiver	Part Number	Marvell MVQ3244	Marvell 88Q2221M

Use case

Order Information

Name	Article Number	Article number cable set*
SFP+ Module MultiGigabit	PT-1445	PRO_1050
SFP Module 100/1000BASE-T1	TE-1441	PRO_1050

*Cable set needs to be ordered separately