

## HSE-70299-xx

# 10/100/1000Mbps RJ45 Copper SFP Transceiver

## Product Description

The 70299-xx is a Copper Small Form pluggable (SFP) transceiver, based on applicable SFP multi-sourcing agreement (MSA). It's compatible with 10/100/1000BASE-T Ethernet standards as specified in IEEE 802.3. The 1000BASE-T physical layer (PHY) can be accessed via I2C, allowing access to all PHY settings and features. The transceiver is compatible with 1000BASE-X auto-negotiation. Link indication feature not available (RX-LOS is internally grounded).

## Features

- Up to 1.25Gbps full duplex data links
- CAT5 Reach up to 100m
- Compact RJ-45 Connector
- Hot-pluggable
- Low power dissipation
- Access to physical layer IC via 2 wire serial bus



## Applications

- 10/100/1000BASE-T
- 1000BASE-X

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Max	Units
Supply Voltage	V <sub>cc</sub>	-0.5	4	V
Storage Temperature	T <sub>s</sub>	-40	85	°C
Operating Case Temperature	T <sub>c</sub>	0	85	°C

## Recommended Operating conditions

Parameter	Symbol	Min.	Typ	Max	Units
Supply Current	I <sub>s</sub>	300	325	345	mA
Power Supply Voltage	V <sub>cc</sub>	3.13	3.3	3.47	V
Power Consumption	P <sub>max</sub>		1.0	1.2	W
Surge Current	I <sub>surge</sub>			345	mA
Data Rate	BR	10		1000	Mb/sec
Max Link length using CAT5 cable	L <sub>max</sub>			100	Meter

## Low-Speed Signals

Parameter	Symbol	Min.	Max	Units	Notes/Conditions
SFP Output LOW	VOL	0	0.5	V	4.7k to 10k pull-up to host V <sub>cc</sub> , measured at host side of connector
SFP Output HIGH	VOH	Host V <sub>cc</sub> -0.5	Host V <sub>cc</sub> +0.3	V	4.7k to 10k pull-up to host V <sub>cc</sub> , measured at host side of connector
SFP Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to V <sub>cc</sub> , measured at SFP side of connector
SFP Input HIGH	VIH	2	V <sub>cc</sub> +0.3	V	4.7k to 10k pull-up to V <sub>cc</sub> , measured at SFP side of connector

## High-Speed Electrical Interface

### Transmission Line - SFP

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Line Frequency	$f_s$	10	125	1000	MHZ	5-level encoding, per IEEE 802.3
Tx Output Impedance	$Z_{out,TX}$		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
Rx Input Impedance	$Z_{in,RX}$		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz

### Interface Host - SFP

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Single ended data input swing	$V_{insing}$	250		1200	mV	Single ended
Single ended data output swing	$V_{outsing}$	350		800	mV	Single ended
Rise/Fall Time	$T_r, T_f$		175		psec	20%-80%
Tx Input Impedance	$Z_{in}$		50		Ohm	Single ended
Rx Output Impedance	$Z_{out}$		50		Ohm	Single ended

Notes:

1. ALL high-speed signals are AC-coupled internally
2. Clock tolerance is +/- 50 ppm
3. By default, the 70299-xx is a full duplex device in preferred master mode
4. Automatic crossover detection is enabled. External crossover cable is not required
5. 10/100/1000 BASE-T operation requires the host system to have an SGMII interface with no clocks, and the module PHY to be configured per Application instructions. With a SERDES that does not support SGMII, the module will operate at 1000BASE-T only.

For safety and reliability reasons, please read the following information carefully.



This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.

## CE EU declaration of conformity

The CE marking is mandatory for this category of products. It is the manufacturer's declaration that the product meets the requirements of the applicable EU directives required to allow free movement and sale of the product throughout the European Economic Area.

## Equipment Specific part number extension

### -XX\*

- 51 Cisco
- 52 Ericsson
- 53 Huawei
- 54 Juniper
- 55 Generic (MSA)
- 56 HP
- 57 Extreme
- 58 3COM (HP)
- 59 Alcatel (Nokia)
- 60 Combo code
- 61 H3C (HP)
- 62 Brocade
- 63 Arista Networks
- 64 Adva
- 65 Microsens