

# 1000Base-T 100m SFP Copper

## ESTRSCS007

### Product Features

- 1.25G Gigabit Ethernet over Cat.5 cable
- Electrical interface specification per SFF-8431
- Management interface specification per SFF-8432 and SFF-8472
- 10/100/1000Base-T auto-negotiation operation in host-systems with SGMI interface
- Up to 100m over Cat.5 cable
- Class 1 laser safety certified
- 1.2W maximum power consumption with established link
- Single +3.3V power supply

### Specification

Parameter	Symbol	Min.	Max.	Unit
Operating temperature (case)	T <sub>OP</sub>	-40	85	°C
Storage temperature (ambient)	T <sub>STO</sub>	-40	85	°C
Relative humidity	RH	5	95	%
Serial bus timing requirements I <sup>2</sup> C clock rate		0	100,000	Hz

### +3.3V Electrical Power Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply current	I <sub>s</sub>		320	400	mA	
Input voltage	V <sub>CC</sub>	3.13	3.3	3.47	V	
Maximum voltage	V <sub>MAX</sub>			3.8	V	

### Low-Speed Signals Electrical Characteristics

Parameter	Symbol	Min.	Max.	Unit	Note
SFP output low	$V_{OL}$	0	0.5	V	
SFP output high	$V_{OH}$	$Host\_V_{CC}-0.5$	$Host\_V_{CC}+0.3$	V	4.7k to 10k pull-up to $Host\_V_{CC}$
SFP input low	$V_{IL}$	0	0.8	V	Measured at host side of connector
SFP input high	$V_{IH}$	2	$V_{CC}+0.3$	V	

### High-Speed Electrical Interface Transmission Line-SFP

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Line frequency	$f_L$		125		MHz	5-level encoding per IEEE 802.3
Tx output impedance	$Z_{OUT TX}$		100		Ohm	Differential for all frequencies
Rx input impedance	$Z_{IN RX}$		100		Ohm	Between 1MHz and 125MHz

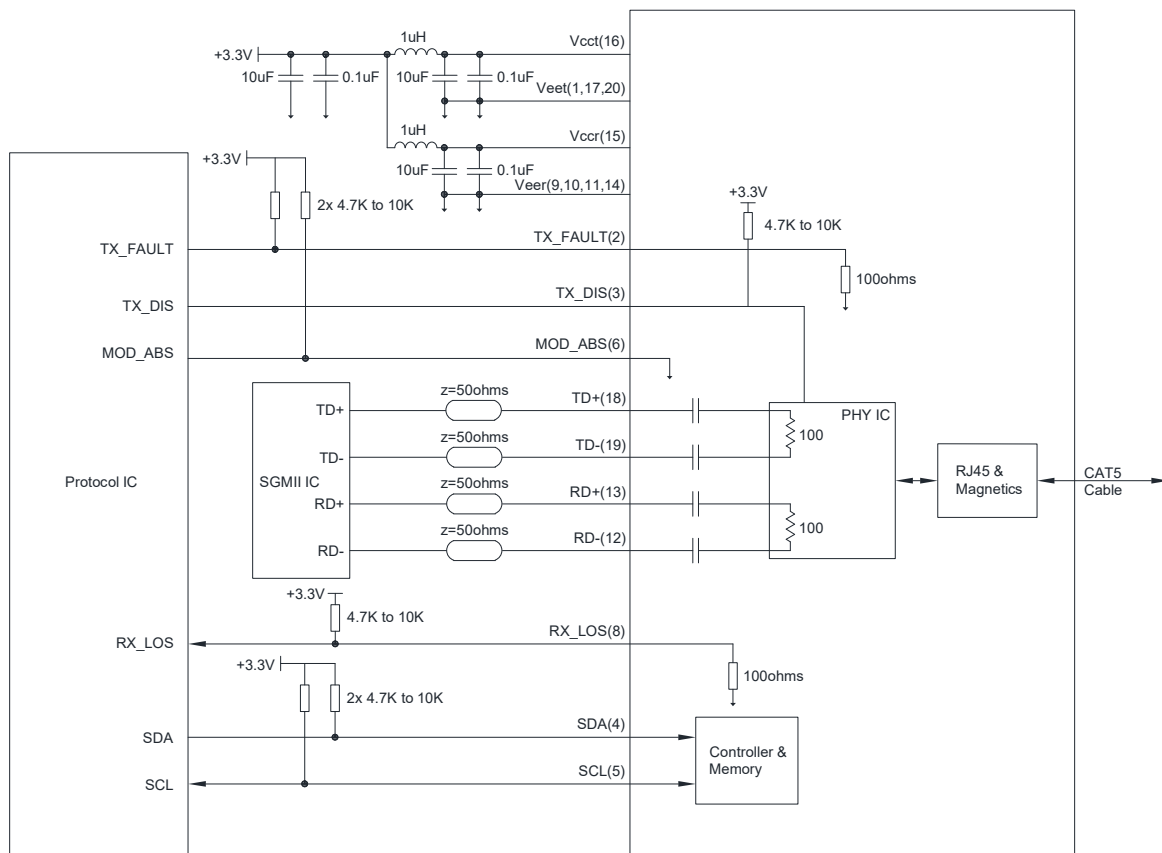
### High-Speed Electrical Interface Host-SFP

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter differential input voltage	$V_{IN}$	500		2400	mV	Differential voltage swings
Receiver differential output voltage	$V_{OUT}$	700		1600	mV	Differential voltage swings
Rise and fall time	$t_r/t_f$		175		Ps	20% - 80%
Tx input impedance	$Z_{IN}$		50		Ohm	Single ended
Rx output impedance	$Z_{OUT}$		50		Ohm	Single ended

## General

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Data rate	BR	10		1000	Mb/sec	IEEE 802.3 compatible
Cable length	L			100	M	Category 5 UTP BER <math><10^{-12}</math>

## Electrical Interface



## Pin Description

Pin	Symbol	Descriptions	Note
1	V <sub>EET</sub>	Transmitter ground (common with receiver ground)	1
2	T <sub>FAULT</sub>	Transmitter fault. Not supported	
3	T <sub>DIS</sub>	Transmitter disable. PHY disabled on high or open	2
4	MOD_DEF(2)	Module definition 2. Data line for serial ID	3
5	MOD_DEF(1)	Module definition 1. Clock line for serial ID	3
6	MOD_DEF(0)	Module definition 0. Grounded within the module	3
7	Rate select	No connection required	
8	LOS	Loss of signal indication	4
9	V <sub>EER</sub>	Receiver ground (common with transmitter ground)	1
10	V <sub>EER</sub>	Receiver ground (common with transmitter ground)	1
11	V <sub>EER</sub>	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver inverted DATA out. AC coupled	
13	RD+	Receiver non-inverted DATA out. AC coupled	
14	V <sub>EER</sub>	Receiver ground (common with transmitter ground)	1
15	V <sub>CCR</sub>	Receiver power supply	
16	V <sub>CCT</sub>	Transmitter power supply	
17	V <sub>EET</sub>	Receiver ground (common with transmitter ground)	1
18	TD+	Transmitter non-inverted DATA in. AC coupled	
19	TD-	Transmitter inverted DATA in. AC coupled	
20	V <sub>EET</sub>	Receiver ground (common with transmitter ground)	1

### Note:

1. Circuit ground is isolated from chassis ground
2. PHY disabled on TxDIS >2.0V or open, enabled on TxDIS <0.8V
3. Should be pulled up with 4.7k – 10k Ohms on host board to a voltage between 2.0V and 3.6V. MOD-DEF(0) pulls line low to indicate module is plugged in
4. LVTTTL compatible with a maximum voltage of 2.5V