

## 10Gbps BIDI 1270/1330nm 60km LC SFP+ Transceiver

### Features

- > Up to 10Gbps data links
- > 60km with 9/125µm SMF \*1
- > WDM 1270/1330nm DFB/APD laser
- > Simplex LC Connector
- > Hot-pluggable SFP+ footprint
- > Single 3.3V power supply
- > Operating temperature: 0~70°C

### Product Description

The SFP+ is a 10Gbps enhanced small form factor pluggable SFP+ transceiver compatible with 10GBASE Ethernet and 10G Fiber Channel. It is suitable for single-mode fiber (SMF) communications in 10Gbps Ethernet and 10G Fiber Channel by single fiber.

### Regulatory Compliance

The transceivers are Class 1 Laser Products comply with FDA regulations. Meet Class 1 eye safety requirements of EN 60825 and the electrical safety requirements of EN 60950.

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	VCC	-0.5	4	V
Storage Temperature	TS	-40	85	°C
Operating Case Temperature	TC	0	70	°C

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0		70	°C
Power Supply Voltage	VCC	3.15	3.3	3.45	V
Power Supply Current	ICC			300	mA
Data Rate			10		Gbps
Max Link Length on 9/125µm SMF	Lmax			60	km

### Optical Characteristics

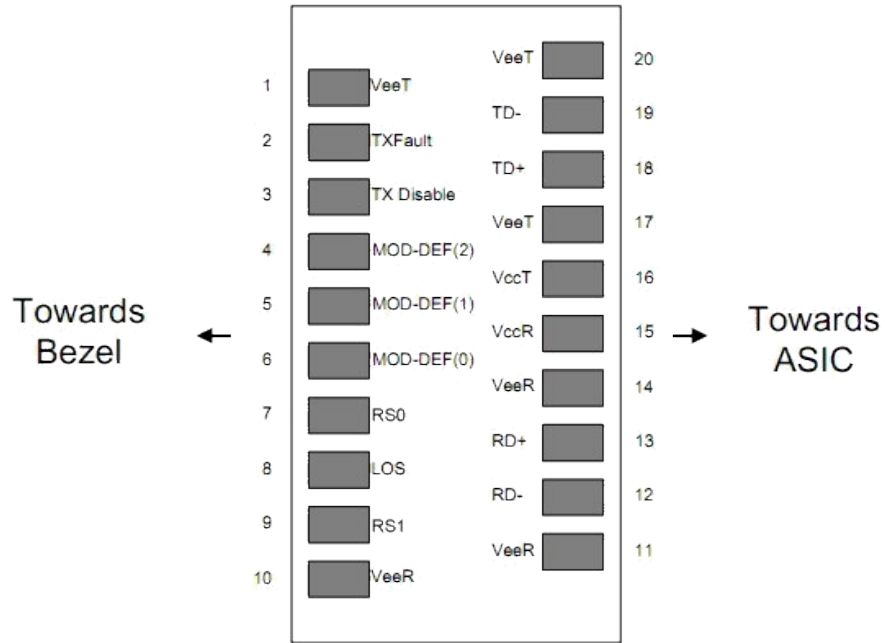
Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>					
Centre Wavelength	$\lambda_c$	1260	1270	1280	nm
Spectral Width (-20dB)	$\sigma$			1	nm
Average Output Power	P <sub>out</sub>	1		5	dBm
Extinction Ratio	ER	3.5			dB
Average Launch Power of Off Transmitter	P <sub>off</sub>			-30	dBm
<b>Receiver</b>					
Centre Wavelength	$\lambda_c$	1320	1330	1340	nm
Receiver Sensitivity	PIN			-20	dBm
Receiver Overload	P <sub>max</sub>	-7			dBm
LOS De-Assert	LOSD			-22	dBm
LOS Assert	LOSA	-24			dBm
LOS Hysteresis		0.5		4.5	dB

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### Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>					
Input Differential Impedance	Z <sub>in</sub>	90	100	110	$\Omega$
Data Input Swing Differential	V <sub>in</sub>	250		1200	mV
Tx-Dis Disable	V <sub>d</sub>	2.0		V <sub>cc</sub>	V
Tx-Dis Enable	V <sub>en</sub>	0		0.8	V
<b>Receiver</b>					
Data Output Swing Differential	V <sub>out</sub>	250		800	mV
Rx-Los Fault	V <sub>lf</sub>	2.0		V <sub>cc</sub> HOST	V
Rx-Los Normal	V <sub>ln</sub>	0		0+0.8	V
Output rise and fall time	T <sub>r</sub> , T <sub>f</sub>	30			ps

### Pin Descriptions



**Diagram of Host Board Connector Block Pin Numbers and Names**

Pin	Symbol	Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	7.1
2	TFault	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	7.2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	7.3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	7.3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	7.3
7	RS0	Rate Select0, optionally controls SFP+ module receiver. When high input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	7.4
9	RS1	Rate Select1, optionally controls SFP+ module receiver. When high input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd	
10	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
11	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	7.1
18	TD+	Transmitter Non-Inverted DATA in.AC Coupled.	
19	TD-	Transmitter Inverted DATA in.AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	7.1

Notes:

7.1 Circuit ground is internally isolated from chassis ground.

7.2 Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

7.3 Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD\_DEF(0) pulls line low to indicate module is plugged in.

7.4 LOS is open collector output. Should be pulled up with 4.7k -10kohms on host board to a voltage between 2.0V and 3.6V.

Logic 0 indicates normal operation; logic 1 indicates loss of signal.

## EEPROM & DDM THRESHOLD

### EEPROM

#### 2 wire address 1010000X (A0h)

0~95 Serial ID Defined by SFP MSA (96 bytes)
96~127 Vendor Speific (32 bytes)
128~255 Reserved (128 bytes)

### DM THRESHOLD

	Low Alarm	Low Warn	High Warn	High Alarm
Temperature	-5°C	0°C	70°C	75°C
Voltage	2.9V	3V	3.6V	3.7V
Tx Bias	15mA	20mA	80mA	85mA
Tx Power	-3dBm	-2dBm	5dBm	6dBm
Rx Power	-26dBm	-25dBm	-8dBm	-7dBm

## Mechanical Specifications

