

## 32GBASE-SR SFP28 850 nm 100 m Transceiver

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### SFP28 Series

- Supports up to 32Gbps bit rates
- Hot-pluggable SFP+ footprint
- 850nm VCSEL laser and PIN photodiode
- Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle
- Single +3.3V power supply
- Operating case temperature:  
Standard: 0 to +70°C

Ascent's SFP28 transceivers are high performance, cost effective modules supporting data rate of 32Gbps and 70m transmission distance with OM3 MMF or 100m transmission distance with OM4 MMF.

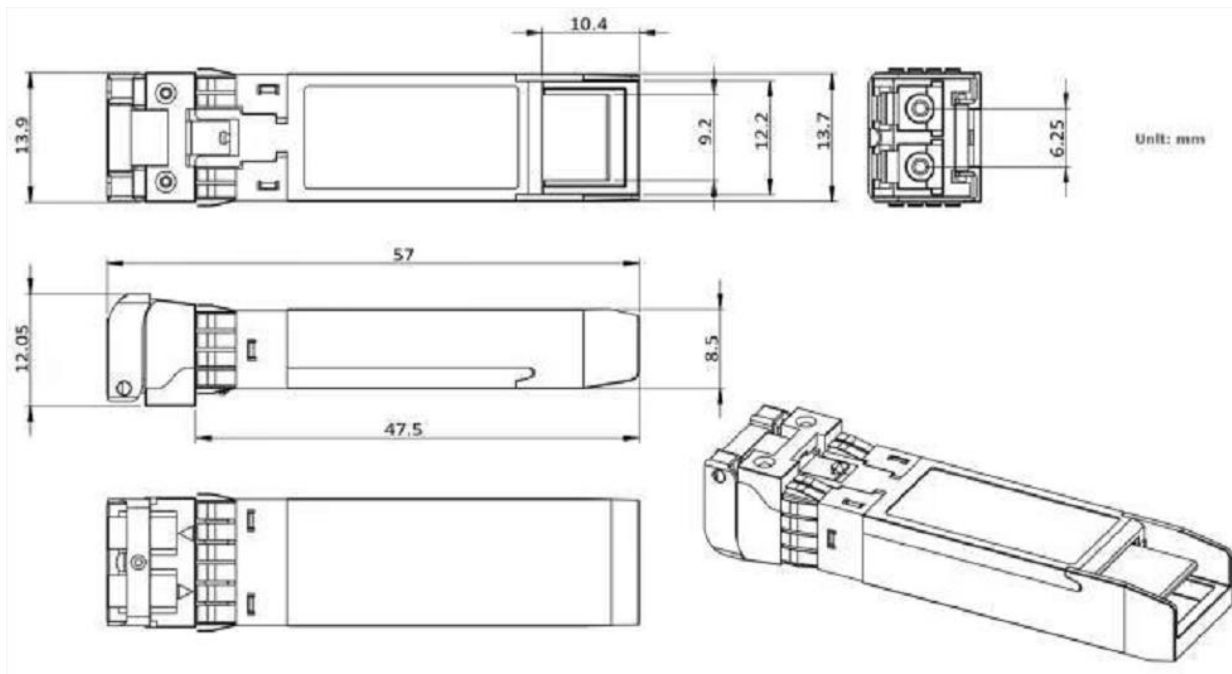
Ascent's SFP28 transceivers provide a unique enhanced digital diagnostic monitoring interface which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power, and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags which alerts end users when particular operating parameters are outside of a factory set normal range.

The transceivers are compatible with SFP Multi-Source Agreement and SFF-8472 digital diagnostics functions.

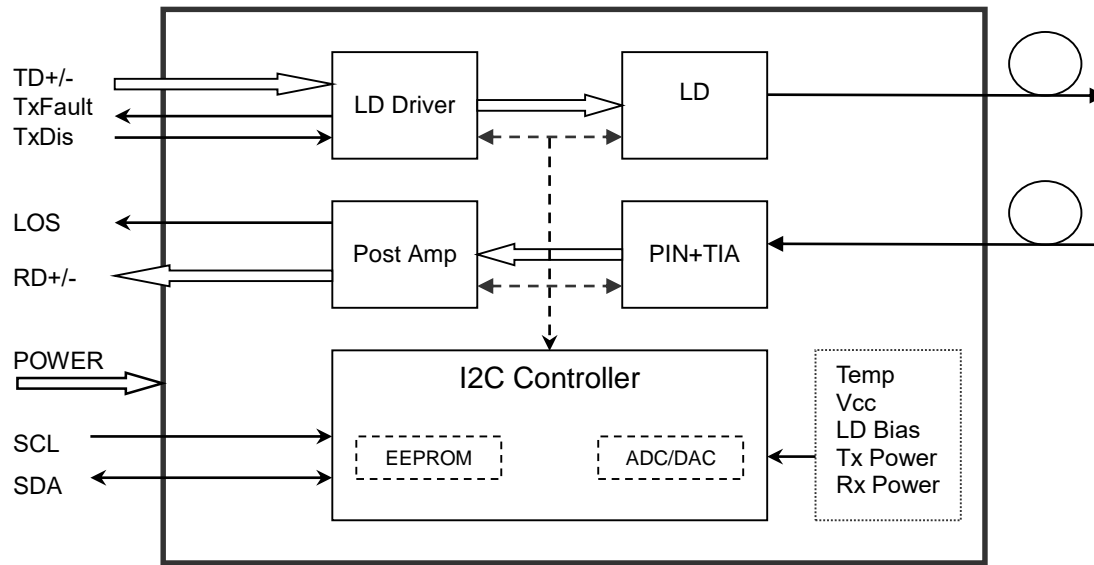
## Key Features

- Supports up to 32Gbps bit rates
- Hot-pluggable SFP+ footprint
- 850nm VCSEL laser and PIN photodiode
- Up to 70m for OM3-MMF and 100m for OM4-MMF transmission
- Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle
- Compatible with RoHS
- Single +3.3V power supply
- Real Time Digital Diagnostic Monitoring
- Operating case temperature:  
Standard: 0 to +70°C

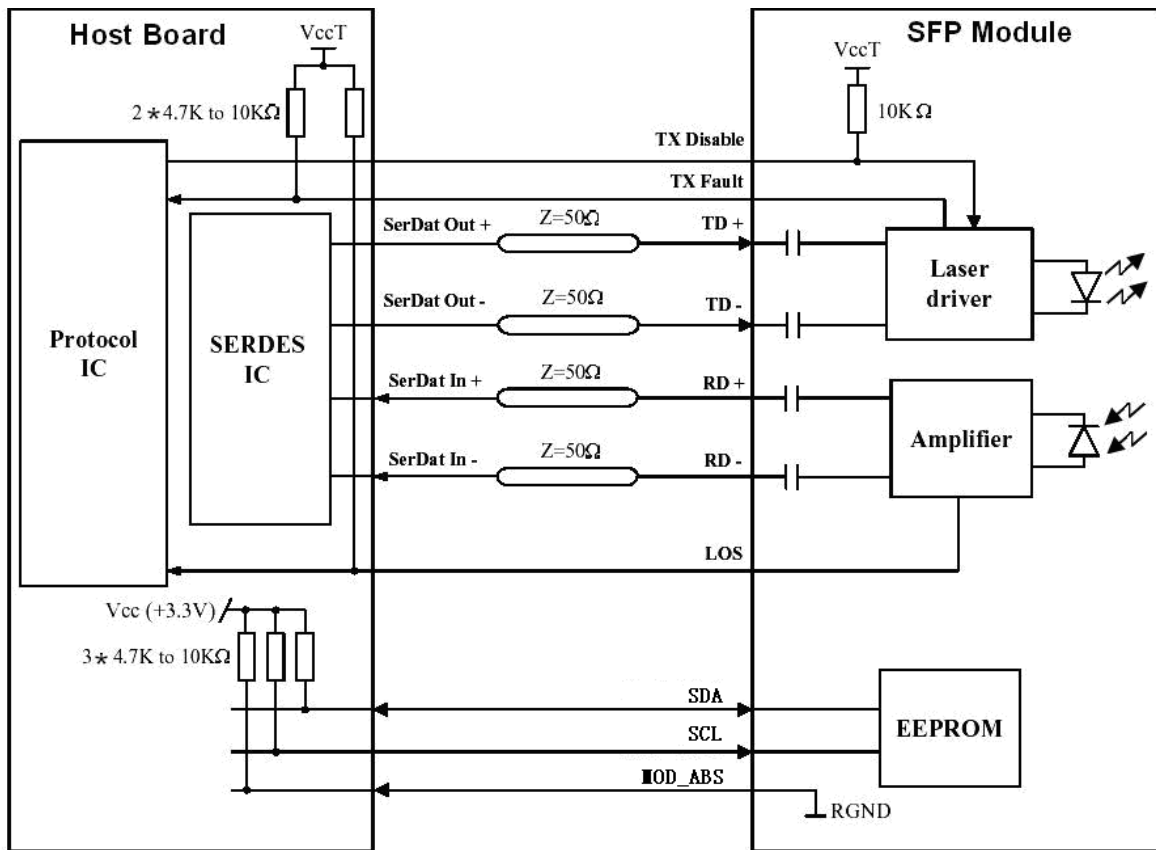
## Mechanical Dimensions



## Transceiver Functional Diagram



## Recommended Interface Circuit

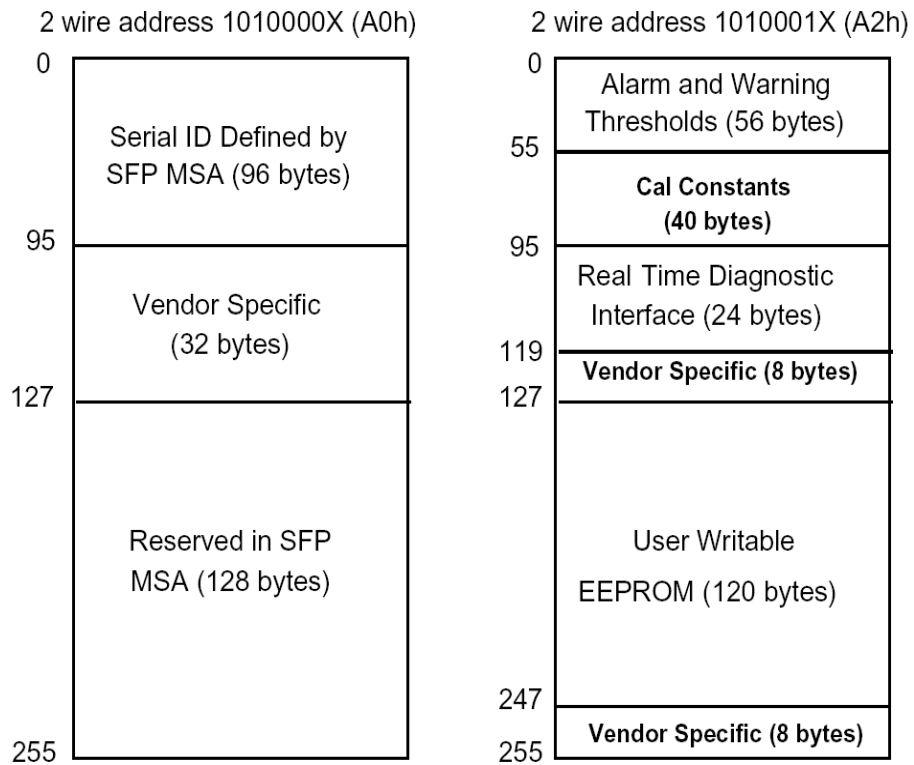


## Digital Diagnostic Memory Map

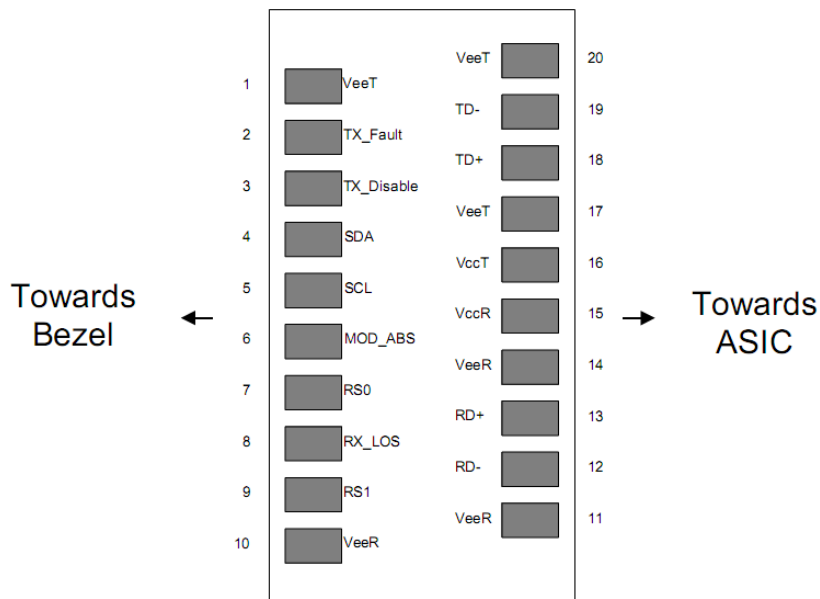
The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following.



## Pin Descriptions



Pin	Signal Name	Description	Plug Seq.	Note
1	VEET	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Note 3
9	RS1	Not Connected	3	
10	VEER	Receiver ground	1	
11	VEER	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	VEER	Receiver ground	1	
15	VCCR	Receiver Power Supply	2	
16	VCCT	Transmitter Power Supply	2	
17	VEET	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5
19	TD-	Inv. Transmit Data In	3	Note 5
20	VEET	Transmitter Ground	1	

#### Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

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

3) LOS is open collector output. Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

4) RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.

5) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

## Specifications

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V <sub>cc</sub>	0	3.6	V
Storage Temperature	T <sub>s</sub>	-40	+85	°C
Operating Humidity	-	5	85	%

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max	Unit
Operating Case Temperature	T <sub>c</sub>	0		+70	°C
Power Supply Voltage	V <sub>cc</sub>	3.135	3.30	3.465	V
Power Supply Current	I <sub>cc</sub>			300	mA
Data Rate			28.05		Gbps

### Optical and Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
<b>Transmitter</b>						
Centre Wavelength	λ <sub>c</sub>	840	850	860	nm	
Spectral Width (RMS)	Δλ			0.6	nm	
Side-Mode Suppression Ratio	SMSR	-	-	-	dB	
Average Output Power	P <sub>out</sub>	-8.4		2.4	dBm	1
Extinction Ratio	ER	2.0			dB	
Data Input Swing Differential	V <sub>IN</sub>	180		950	mV	2
Input Differential Impedance	Z <sub>IN</sub>	90	100	110	Ω	
TX Disable	Disable	2.0		V <sub>cc</sub>	V	
	Enable	0		0.8	V	
TX Fault	Fault	2.0		V <sub>cc</sub>	V	
	Normal	0		0.8	V	
<b>Receiver</b>						
Centre Wavelength	λ <sub>c</sub>	840	850	860	nm	
Receiver Sensitivity				-10	dBm	3
Receiver Overload		2.4			dBm	3
LOS De-Assert	LOS <sub>D</sub>			-13	dBm	
LOS Assert	LOS <sub>A</sub>	-30			dBm	
LOS Hysteresis		0.5		4	dB	
Data Output Swing Differential	V <sub>out</sub>	500	700	900	mV	4
LOS	High	2.0		V <sub>cc</sub>	V	
	Low			0.8	V	

### Notes:

1. The optical power is launched into MMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2<sup>31</sup>-1 test pattern @28.05Gbps, BER ≤1E-6.
4. Internally AC-coupled.

## Timing Requirement

Parameter	Symbol	Min.	Typ.	Max.	Unit
Tx Disable Negate Time	t_on			2	ms
Tx Disable Assert Time	t_off			100	µs
Time To Initialize, including Reset of Tx Fault	t_init			300	ms
Tx Fault Assert Time	t_fault			100	µs
Tx Disable To Reset	t_reset	10			µs
LOS Assert Time	t_loss_on			100	µs
LOS De-assert Time	t_loss_off			100	µs
Serial ID Clock Rate	f_serial_clock		100	400	KHz
MOD_DEF (0:2)-High	VH	2		Vcc	V
MOD_DEF (0:2)-Low	VL			0.8	V

## Diagnostics

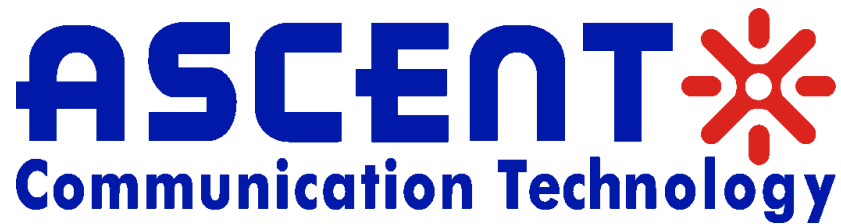
Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal
Voltage	3.0 to 3.6	V	±3%	Internal
Bias Current	0 to 20	mA	±10%	Internal
TX Power	-8.0 to 3	dBm	±3dB	Internal
RX Power	-12 to 2.4	dBm	±3dB	Internal

## Ordering Information

Product Name	Product Description
SFP28-32LP-85-01	SFP28 Plug-in, 32Base-SR, 32Gbps, 100m OM4, TX/RX 850nm, on two multimode fibres, LC/PC DDM

## Contact Information

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