ASCENT ✳
Communication Technology

32G FC SFP28 1310 nm 10 km Transceiver

SFP28 Series

- **Supports up to 32Gbps bit rates**
- **Hot-pluggable SFP+ footprint**
- **1310nm DFB laser and PIN photodiode, Up to 10km for SMF transmission**
- **Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle**
- **Compatible with RoHS**
- **Single +3.3V power supply**

Ascent's SFP28 transceivers are high performance, cost effective modules supporting data rate of 32Gbps and 10km transmission distance with SMF.

Ascent's SFP28 32G transceivers consist of three sections: a DFB laser transmitter, a PIN photodiodeintegrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. They 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. The transceiver is RoHS compliant and per Directive 2011/65/EU.

Key Features

- Supports up to 32Gbps bit rates

- Hot-pluggable SFP+ footprint

- 1310nm DFB laser and PIN photodiode, Up to 10km for SMF 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

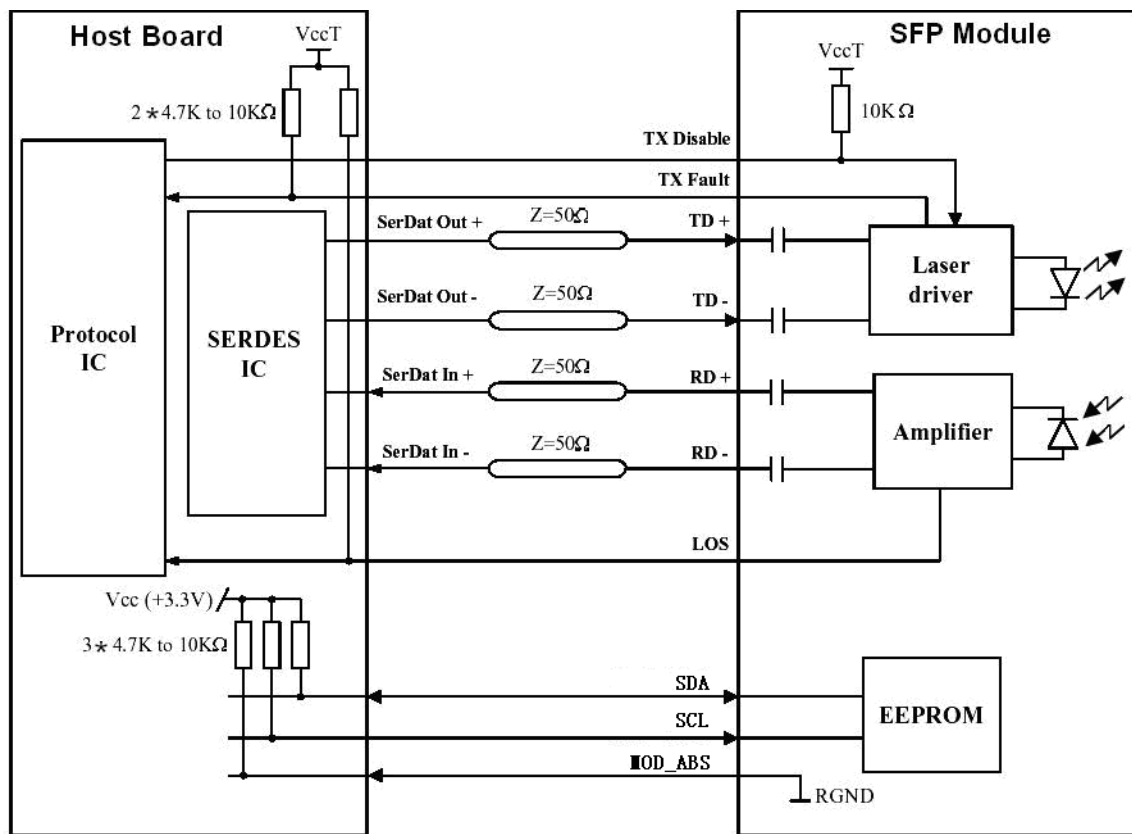- 16G FC / 32G FC Fibre channel

Mechanical Dimensions
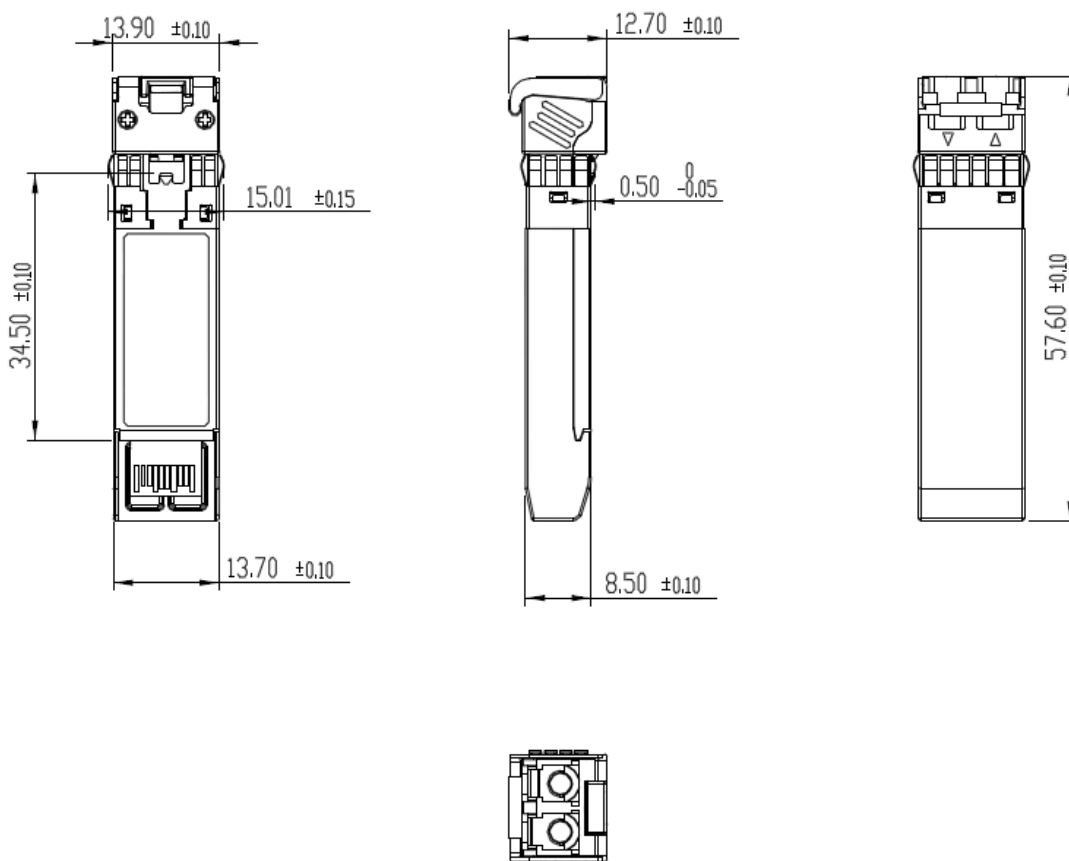
Transceiver Functional Diagram
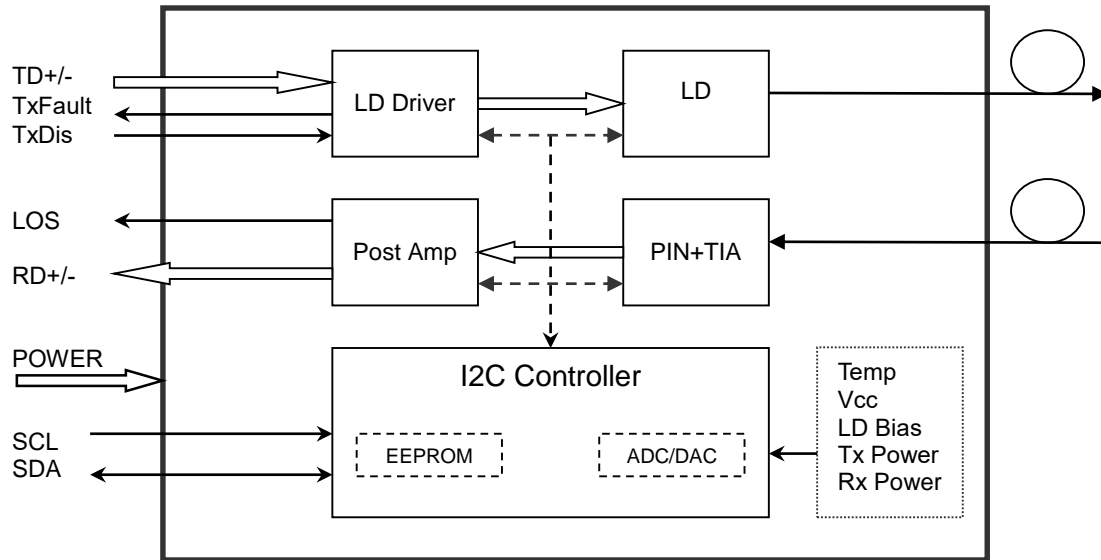

Recommended Interface Circuit

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.
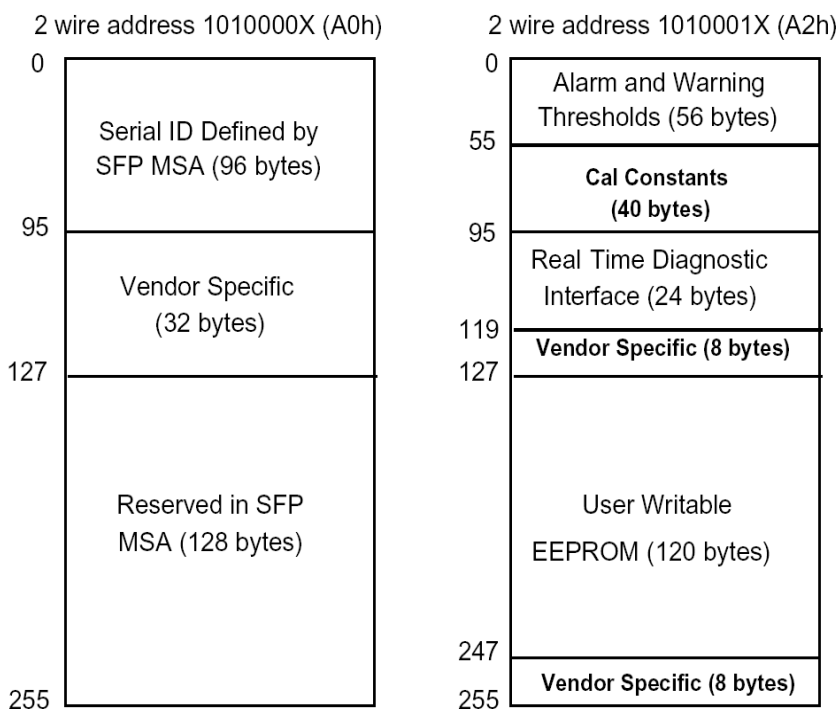
Pin Assignment
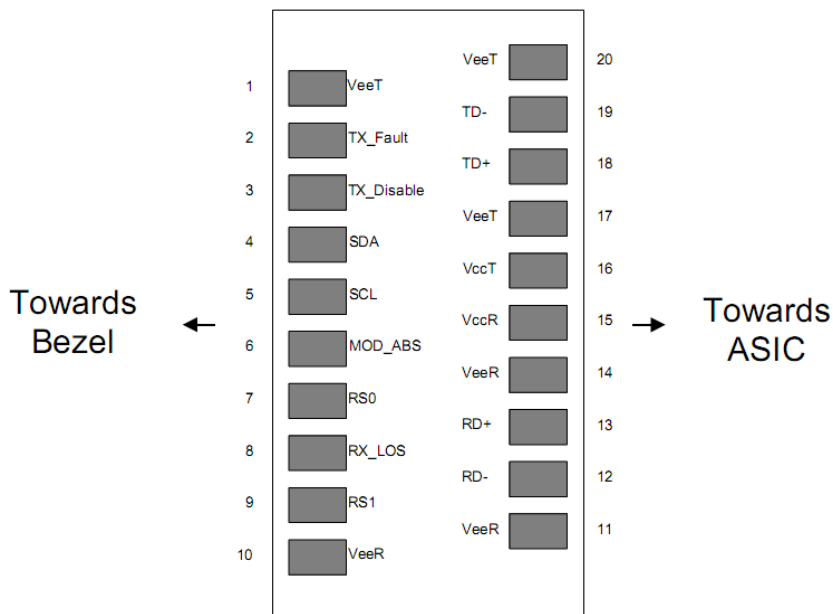
Pin	Symbol	Name/Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	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	Vcc	-0.5	4.5	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max	Unit
Operating Case Temperature	Tc	0		+70	°C
Power Supply Voltage	Vcc	3.135	3.30	3.465	V
Power Supply Current	Icc			400	mA
Data Rate			28.05		Gbps

Optical and Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter							
Centre Wavelength		λc	1270	1310	1350	nm	
Spectral Width (-20dB)		$\Delta\lambda$			1	nm	
Side-Mode Suppression Ratio		SMSR	30	-		dB	
Average Output Power		P_{out}	-7		2	dBm	1
Extinction Ratio		ER	4			dB	
Data Input Swing Differential		V_{IN}	180		850	mV	2
Input Differential Impedance		Z_{IN}	90	100	110	Ω	
TX Disable	Disable		2.0		Vcc	V	
	Enable		0		0.8	V	
TX Fault	Fault		2.0		Vcc	V	
	Normal		0		0.8	V	
Receiver							
Centre Wavelength		λc	1260		1600	nm	
Receiver Sensitivity					-11.6	dBm	3
Receiver Overload			2.4		2	dBm	3
LOS De-Assert		LOS_D			-15	dBm	
LOS Assert		LOS_A	-30			dBm	
LOS Hysteresis			0.5		4	dB	
Data Output Swing Differential		V_{out}	300		900	mV	4
LOS	High		2.0		Vcc	V	
	Low				0.8	V	

Notes:
1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2^{31}-1 test pattern @28.05Gbps, BER ≤1E-6.
4. Internally AC-coupled.

Timing and Electrical

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	V_H	2		Vcc	V
MOD_DEF (0:2)-Low	V_L			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	-7 to 2	dBm	±3dB	Internal
RX Power	-14 to +2	dBm	±3dB	Internal

Ordering Information

Product Name	Product Description
SFP28-32LP-31-10	SFP28 Plug-in, 32Base-LR, 32Gbps, 10km, TX/RX 1310nm, on two multimode fibres, LC/PC DDM

Contact Information
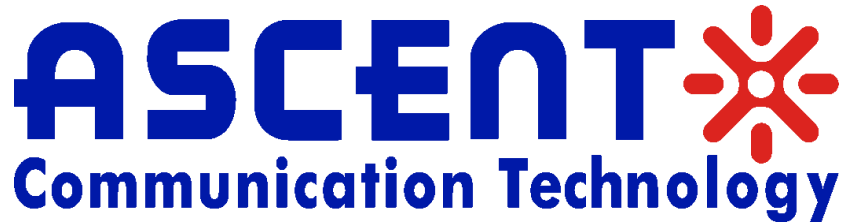
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