25G SFP28 SR Optical Transceiver

Product Features:

- Lane bit rate 25.78 Gb/s
- SFP28 MSA package with duplex LC connector
- 850nm VCSEL transmitter, PIN photo-detector
- Up to 100m on OM4 MMF, 70m on OM3 MMF
- 2-wire interface for management specifications compliant with SFF 8472 digital diagnostic monitoring interface for optical transceivers
- Cost effective SFP28 solution, enables higher port densities and greater bandwidth
- Power Supply :+3.3V
- Low Power consumption<1W
- Operating case temperature: 0~70 °C
- RoHS compliant

Applications:

- 25GE SR
- eCPRI
- 100GE SR fan out to 4x25GE SR

Description:

SFP-25G-85-SR is a very compact optical transceiver module converts 25Gbit/s serial PECL or CML electrical data into serial optical data compliant with the 25GBASE-SR standard. The SFP28 SR module electrical interface is compliant to CEI electrical specifications. The VCSEL transmitter and PIN receiver provide superior performance for Ethernet applications at up to 100m links on OM4 MMF.
The SFP28 Module compliant with SFF-8431, SFF-8432 and IEEE 802.3by 25GBASE-SR. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.
The fully SFP28 compliant form factor provides hot pluggability, easy optical port upgrades and low EMI emission

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	TS	-40	-	+85	°C
Operate Temperature	TC	0	-	+70	°C
Supply Voltage	VCC	0	-	+3.6	V
Operating Relative Humidity	RH	5	-	+95	

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	Vcc	3.135		3.465	V	
Supply Current	Icc			300	mA	
Power Consumption	P			1	W	
Data Rate	R	-	25.78		Gb/s	
Transmitter Section:						
Input differential impedance	R_{in}		100		Ω	1
Tx Input Single Ended DC Voltage Tolerance (Ref VeeT)	V	-0.3		4	V	
Differential input voltage swing	Vin,pp	200		900	mV	2
Transmit Disable Voltage	V_D	2		Vcc	V	3
Transmit Enable Voltage	V_{EN}	Vee		Vee+0.8	V	
Receiver Section:						
Single Ended Output Voltage Tolerance	V	-0.3		4	V	
Rx Output Diff Voltage	Vo	300		900	mV	
Rx Output Rise and Fall Time	Tr/Tf	9.5			ps	4
LOS Fault	$V_{LOS\ fault}$	2		Vcc_{HOST}	V	5
LOS Normal	$V_{LOS\ norm}$	Vee		Vee+0.8	V	5

Note:

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
2. Per SFF-8431 Rev 3.0
3. Into 100 ohms differential termination.
4. 20%~80%
5. LOS is an open collector output. Should be pulled up with 4.7k – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

Optical Characteristics

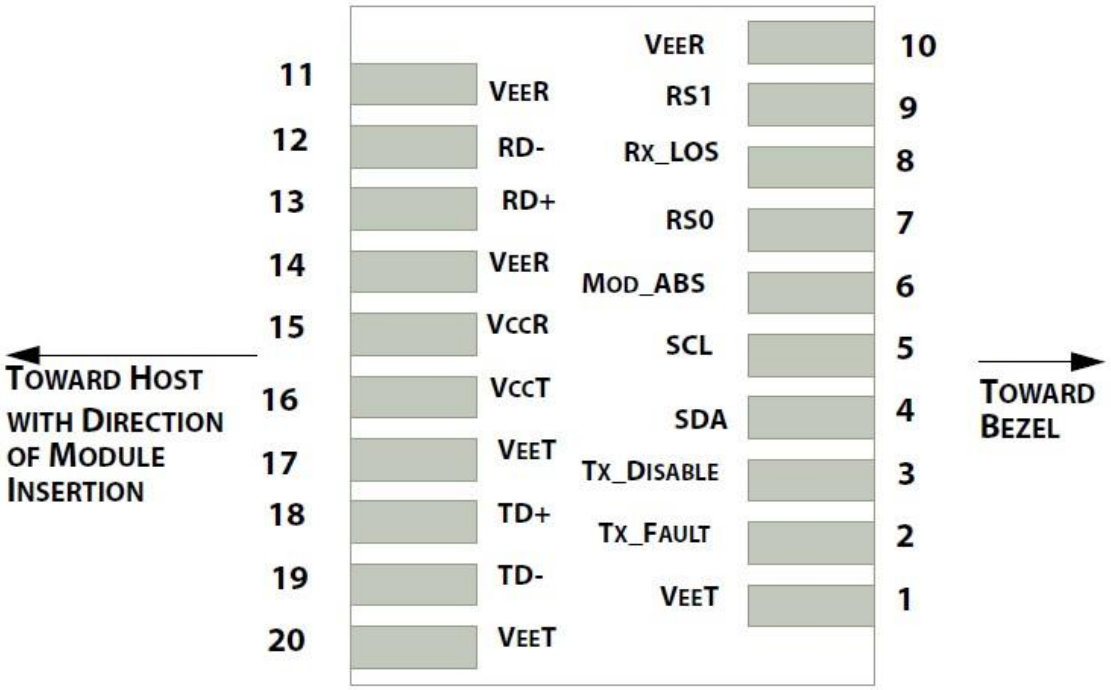
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λt	840	850	860	nm	
spectral width	△λ			1	nm	
Average Optical Power	Pavg	-7.0		+2.4	dBm	
Optical Power OMA	Poma	-6.4	-1.5	3	dBm	
Laser Off Power	Poff			-30	dBm	
Extinction Ratio	ER	3.0			dB	
Receiver Section:						
Center Wavelength	λr	840	850	860	nm	
Receiver Sensitivity	Sen			-10.3	dBm	1
Los Assert	LOS_A	-30		-	dBm	
Los Dessert	LOS_D			-12.3	dBm	
Los Hysteresis	LOS_H	0.5		5	dB	
Overload	Sat	2			dBm	

Note:

1. Measured with a PRBS 2^31-1 test pattern, @25.78Gb/s, BER<5E-5.

Pin Assignment

Diagram of Host Board Connector Block Pin Numbers and Name



Pin Function Definitions

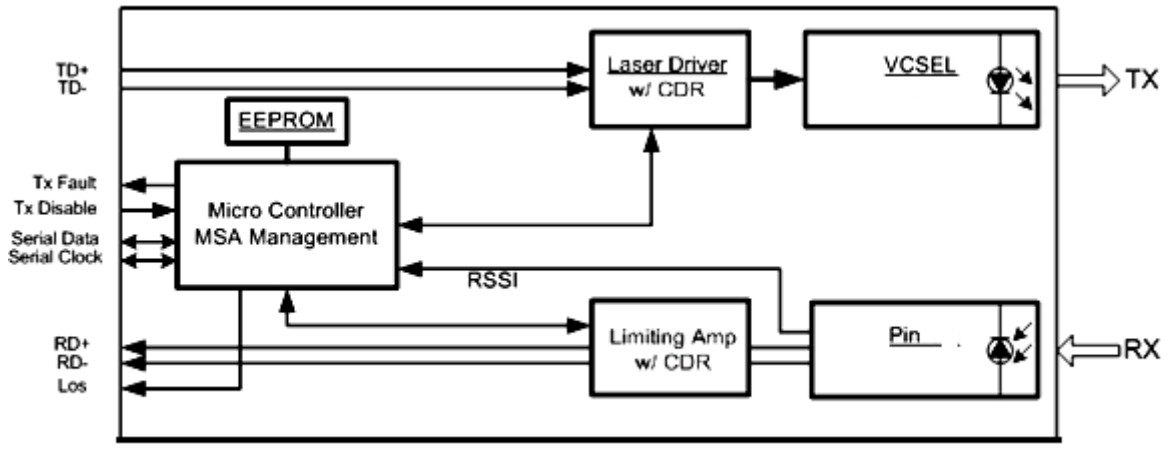
PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	1
2	Tx Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	2
7	RS0	Rate select0, optionally control SFP+ receiver.	
8	LOS	Receiver Loss of Signal Indication	
9	RS1	Rate select0, optionally control SFP+ transmitter.	
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	

16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter non-inverted data out put	
19	TD-	Transmitter inverted data out put	
20	VeeT	Module transmitter ground	1

Note:

1. The module ground pins shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.
3. This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
4. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.

Transceiver Block Diagram



SFP28 Module EEPROM Information and Management

The SFP28 modules implement the 2-wire serial communication protocol as defined in the SFP -8472. The serial ID information of the SFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h.

The memory is mapped in Table 1.

Detailed ID information (A0h) is listed in Table 2.

And the DDM specification at address A2h.

For more details of the memory map and byte definitions, please refer to the SFF-8472, “Digital Diagnostic Monitoring Interface for Optical Transceivers”. The DDM parameters have been internally calibrated.

Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)

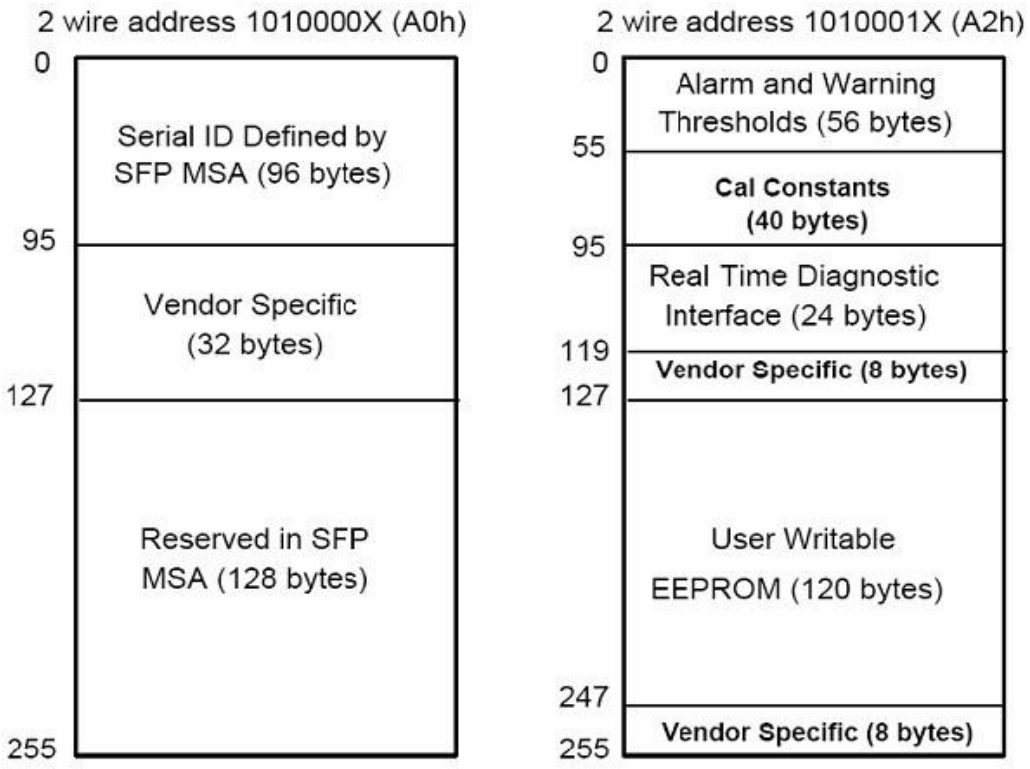
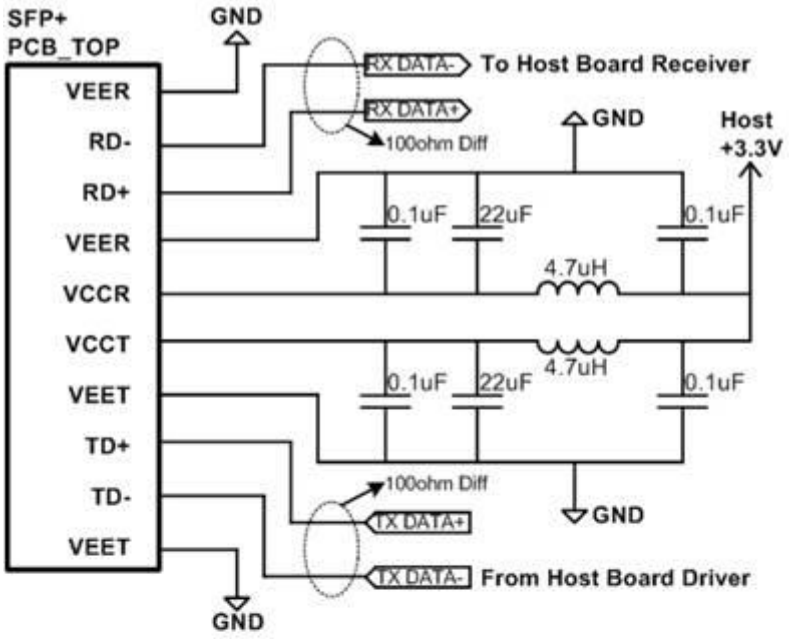


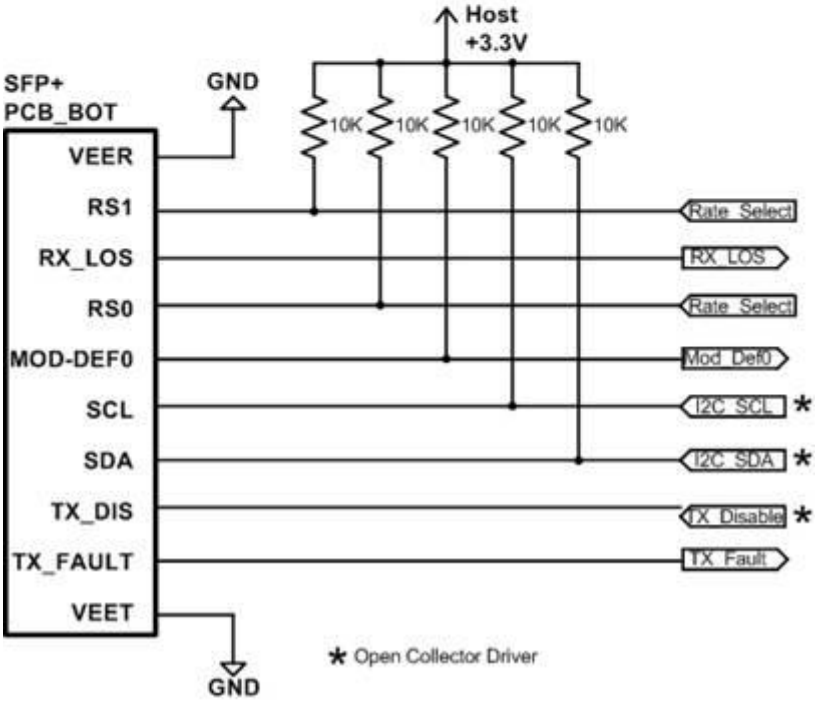
Table 2 - EEPROM Serial ID Memory Contents **(A0h)**

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	
11	1	Encoding	
12	1	BR, Nominal	Nominal baud rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID

40-55	16	Vendor PN	
56-59	4	Vendor rev	Revision level for part number
60-62	3	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	Specific date, read only
128-255	128	Reserved	Reserved for SFF-8079

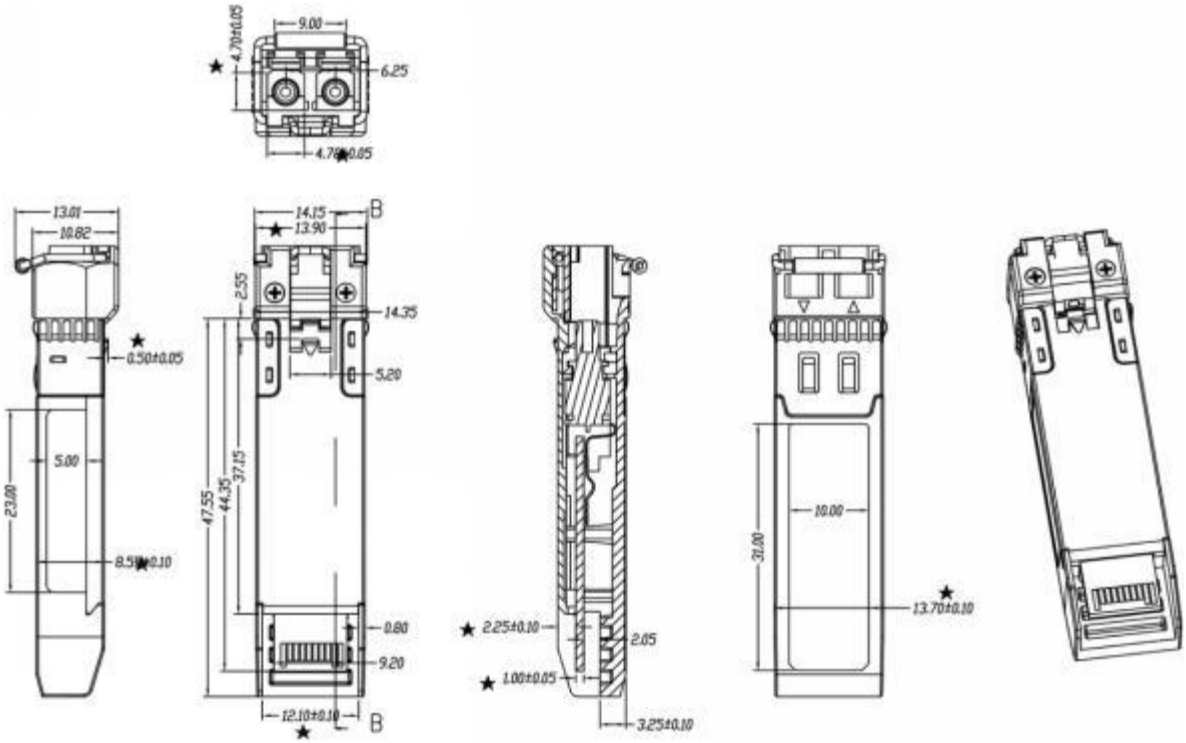
Recommended Circuit





Recommended High-speed Interface Circuit

Mechanical Dimensions



Ordering Information

Part No.	Data Rate	DDM	Wave	Fiber Type	Dist.	Temp.	Optical Interface
SFP-25G-85-SR	25Gbps	yes	850nm	MMF	100m	0~70℃	LC

NOTICE:

Connlight reserves the right to make changes to this product in this specification without notice, in order to improve product performance.