

## OP-S25G85-01

### 25G SFP28 SR Multimode 850nm LC DDM

#### Features

- Supports 25.78Gb/s bit rate
- 850nm VCSEL laser and PIN photo-detector
- Maximum link length of 70m on OM3 MMF and 100m on OM4 MMF
- Digital diagnostics functions are available via the I2C interface
- Power consumption less than 1W
- +3.3V power supply
- Operating case temperature Commercial 0-70
- RoHS compliant
- Password protection for A0h and A2h



#### Applications

- 25GBASE-SR Ethernet
- 32G Fiber Channel
- Other optical links

#### Overview

OP-S25G85-01 SFP28 SR transceivers are designed for 24.33Gbps and 25.78Gbps data rate over MMF and support up to 100m link length on OM4 and 70m link length on OM3. They are compliant to SFF-8402 IEEE802.3by, SFF-8432. Digital diagnostic monitoring interface compliant to SFF-8472 is available via an I2C interface.

#### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	V <sub>cc</sub>	-0.5	-	+3.6	V	
Storage Temperature	T <sub>s</sub>	-40	-	+85	°C	
Operating Humidity	RH	+5	-	+85	%	1

#### Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T <sub>c</sub>	0	-	+70	°C	
Power Supply Voltage	V <sub>cc</sub>	3.14	3.3	3.47	V	
Power Supply Current	I <sub>cc</sub>	-	-	300	mA	
Power Dissipation	P <sub>d</sub>	-	-	1.0	W	
Bit Rate	BR	8.5	25.78125	-	Gbps	

## Electrical Characteristic

Parameter	Symbol	Min.	Typ	Max.	Units	Notes	
<b>Transmitter</b>							
Differential Data Input Swing	$V_{in,P-P}$	200	-	1600	mV <sub>P</sub>		
Input Differential Impedance	$Z_{IN}$	90	100	110	$\Omega$		
Tx_Fault	Normal Operation	$V_{OL}$	0	-	0.8	V	
	Transmitter Fault	$V_{OH}$	2.0	-	$V_{CC}$	V	
Tx_Disable	Normal Operation	$V_{IL}$	0	-	0.8	V	
	Laser Disable	$V_{IH}$	2.0	-	$V_{CC}+0.3$	V	
<b>Receiver</b>							
Differential Date Output	$V_{out}$	400	-	800	mV		
Output Differential Impedance	$Z_D$	90	100	110	$\Omega$		
Rx_LOS	Normal Operation	$V_{OL}$	0	-	0.8	V	
	Lose Signal	$V_{oH}$	2.0	-	$V_{CC}$	V	

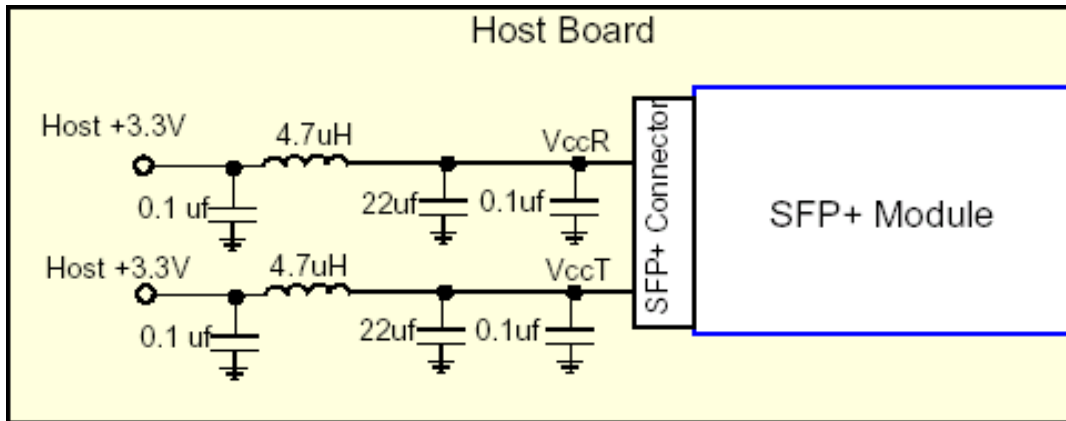
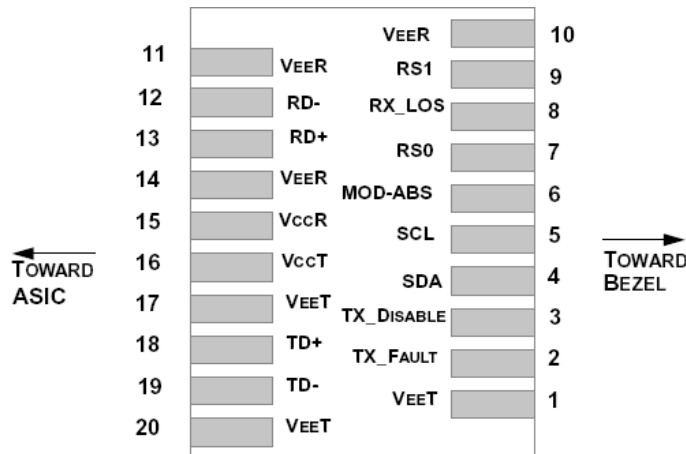
## Optical Characteristic

Parameter	Symbol	Unit	Min	Typ	Max	Notes
<b>Optical transmitter Characteristics</b>						
Bit Rate	BR	Gbps	8.5	25.78125	-	1
Center Wavelength Range	$\lambda_c$	nm	820	850	880	
RMS Spectral Width	$\Delta\lambda$	nm	-	-	0.6	
Average Launch power Tx_off	P <sub>off</sub>	dBm	-	-	-30	
Average Optical Power	P <sub>0</sub>	dBm	-5.0		2.4	2
Extinction Ratio	ER	dB	2.0	-	-	
Optical return loss tolerance	ORL	dB	-	-	12	
Optical Eye Mask	-	%	5	-	-	
<b>Optical Receiver Characteristics</b>						
Bit Rate	BR	Gbps	8.5	25.78125	-	1
Center Wavelength Range	$\lambda_c$	nm	820	-	880	
Damage threshold	DT	dBm	3.4	-	-	
Overload Input Optical power	P <sub>IN</sub>	dBm	2.4	-	-	
Receive Sensitivity (Average Power)	-	dBm	-	-	-10.3	3
LOS De-Assert	LOS <sub>D</sub>	dBm	-	-	-13	

LOS Assert	LOS <sub>A</sub>	dBm	-30	-	-	
LOS Hysteresis	LOS <sub>H</sub>	dB	0.5			

**Note:**

1. Set low of RS0/RS1 pin and 0 of RS0/RS1 bit. Engine CDR lock at low bit rate. Set high of RS0/RS1 pin and 0 of RS0/RS1 bit. Engine CDR lock at high bit rate.
2. Coupled into 50/125 MMF.
3. BER=5x10<sup>-5</sup>; PRBS 2<sup>31</sup>-1 @25.78125Gbps.
4. BER=1x10<sup>-12</sup>; PRBS2<sup>31</sup>-1@25.78125Gbps.

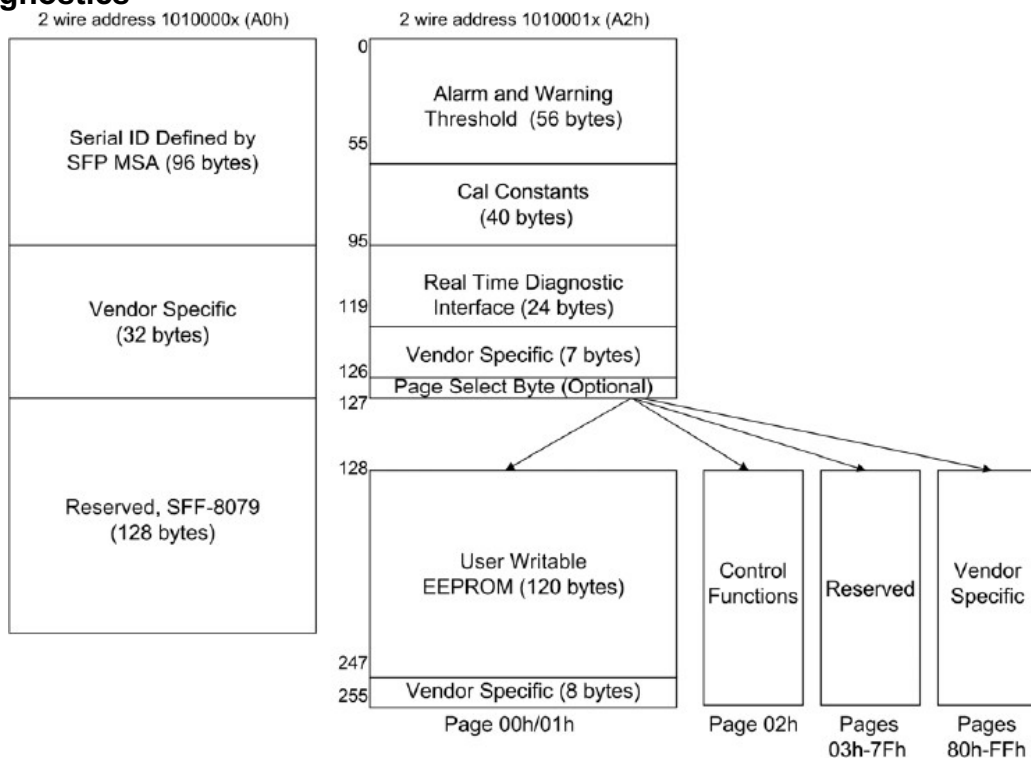
**Recommended Host Board Power Supply Circuit**

**Recommended Interface Circuit**
**Pin definition**


Pin	Symbol	Name/Description	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	SDA	2-Wire Serial Interface Data Line (MOD-DEF2)	

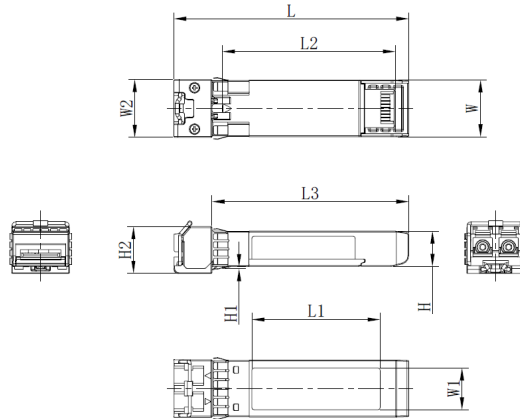
5	SCL	2-Wire Serial Interface Clock (MOD-DEF1)	
6	MOD_ABS	Module Absent, connected to V <sub>EE</sub> T or V <sub>EE</sub> R in the module	2
7	RS0	Rate Select 0	4
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)	2
9	RS1	Rate Select 1	4
10	V <sub>EE</sub> R	Module Receiver Ground	1
11	V <sub>EE</sub> R	Module Receiver Ground	1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-Inverted Data Output	
14	V <sub>EE</sub> R	Module Receiver Ground	1
15	V <sub>CC</sub> R	Module Receiver 3.3 V Supply	
16	V <sub>CC</sub> T	Module Transmitter 3.3 V Supply	
17	V <sub>EE</sub> T	Module Transmitter Ground	1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	V <sub>EE</sub> T	Module Transmitter Ground	1

**Note:**

1. The module ground pins are isolated from the module case.
2. The pins shall be pulled up with 4.7K-10Kohms to a voltage between 3.14V and 3.46V on host board.
3. The pin is pulled up to VCCT with a 4.7K-10KΩ resistor in the module.
4. See SFF-8472 Rev12.2 Table 10-2.

**Digital Diagnostics**


## Mechanical Dimension



Unit: mm

	L	L1	L2	L3	W	W1	W2	H	H1	H2
MAX	56.9	31.2	41.95	47.7	13.8	10.2	14.0	8.6	0.6	11.5
Typical	56.7	31.0	41.80	47.5	13.7	10.0	-	8.5	0.55	11.3
MIN	56.5	30.8	41.65	47.3	13.5	9.8	-	8.4	0.5	11.1

## Order Information

Part No	Data Rate	Wavelength	Distance	Fiber Type	DDM	Temp
OP-S25G85-01	25.78125	850	100m	MMF	YES	0°C~+70°C
OP-S25G85-01I	25.78125	850	100m	MMF	YES	-40°C~+85°C

## Warnings

**Handling Precautions:** This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

**Laser Safety:** Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.