SFP28 25G Active Optical Cables

ECX-SFP28-AOC-XX-XM

Features

- Electrical interface compliant to SFF-8431
- 850nm VCSEL laser and PIN photo-detector
- Maximum link length of 70m on OM3 MMF
- Digital diagnostics functions are available via the I2C interface
- Operating case temperature

  Commercial: 0℃to +70℃
- +3.3V single power supply
- Power consumption less than 1W
- RoHS compliant
- Password protection for A0h and A2h

Applications

- 25GBASE-SR Ethernet
- Servers, switches, storage and host card adapters

Absolute Maximum Ratings

Table1- Absolute Maximum Ratings

Form Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	Vcc3	-0.5		+3.6	V	
Storage Temperature	Ts	-10		+70	°C	
Operating Humidity	RH	5		85	%	1

Note: 1 No condensation

Recommended Operating Conditions

Table 2- Recommended operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	Tc	0	-	+70	℃	
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
Power Supply Current	Icc	-	-	300	mA	
Power Dissipation	Pd	-	-	1.0	W	
Bit Rate	BR	8.5	25.78125	-	Gbps	
Fiber Bend Radius	Rb	3	-	-	cm	

Electrical Characteristics

Table 3- Electrical Characteristics

Parameter		Symbol	Min	Typ	Max	Units	Notes
Electrical Transmitter Characteristics							
Differential Data Input Swing		Vin,p-p	200	-	1600	mVpp	
Input Differential Impedance		ZIN	90	100	110	Ω	
Tx_Fault	Normal Operation	VOL	0	-	0.8	V	
	Transmitter Fault	VOH	2.0	-	Vcc	V	
Tx_Disable	Normal Operation	VIL	0	-	0.8	V	
	Laser Disable	VIH	2.0	-	Vcc+0.3	V	
Electrical Receiver Characteristics							
Differential Date Output Swing		Vout	400	-	800	mV	
Output Differential Impedance		ZD	90	100	110	Ω	
Rx_LOS	Normal Operation	VOL	0	-	0.8	V	
	Transmitter Fault	VOH	2.0	-	Vcc	V	

Optical Characteristics

Table 4-Optical Characteristics

Parameter	Symbol	Unit	Min	Typical	Max	Notes
Optical transmitter Characteristics						
Bit Rate	BR	Gbps	8.5	25.78125		
Centre Wavelength Range	λc	nm	820	850	880	
Average Output Power Tx_off	Poff	dBm	-	-	-45	
Launch Optical Power	Po	dBm	-6.0		2.4	1
Extinction Ratio	ER	dB	2	-	-	

Spectral Width(RMs)	RMs	nm	-	-	0.65	
Differential data input swing	VIN,PP	mV	40		1000	
Spectral Width(RMS)	RMS	nm	-	-	0.65	
Optical Receiver Characteristics						
Bit Rate	BR	Gbps	8.5	25.78125		
Bit Error Rate	BER		-	-	E-12	
Damage threshold	DT	dBm	3.4	-	-	
Overload Input Optical Power	PIN	dBm	2.4	-	-	2
Center Wavelength Range	λc	nm	820	-	880	
Receiver Sensitivity in Average Power	Sen	dBm	-	-	-5.2	3
LOS De-Assert	LosA	dBm	-30	-	-	
LOS Assert	LosD	dBm	-	-	-13	
LOS Hysteresis	LosH	dBm	0.5			

Note:

1. Coupled into 50/125 MMF.
2. Measured with PRBS 2^{31} -1 test pattern @25.78125Gbps.BER=E-12
3. BER=1x10^{-12} ; PRBS2^{31} -1@25.78125Gbps.

Pin Descriptions

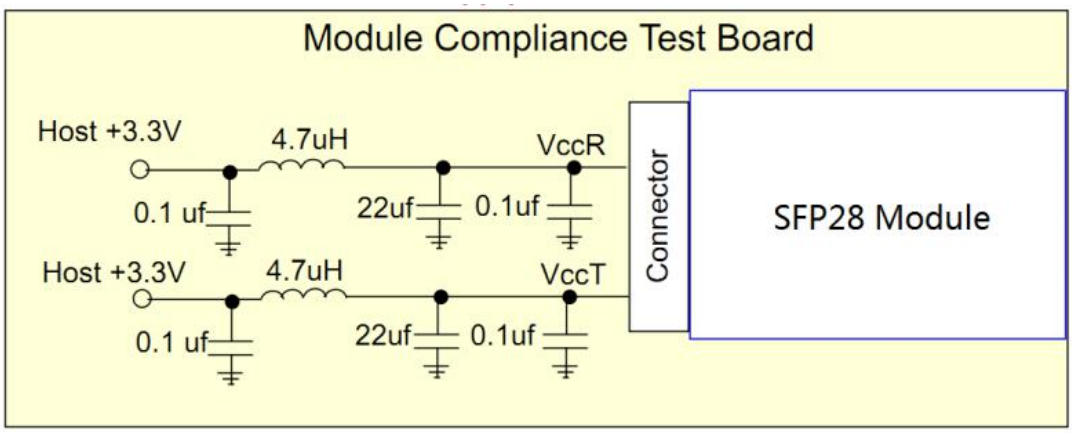


Figure 1, Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

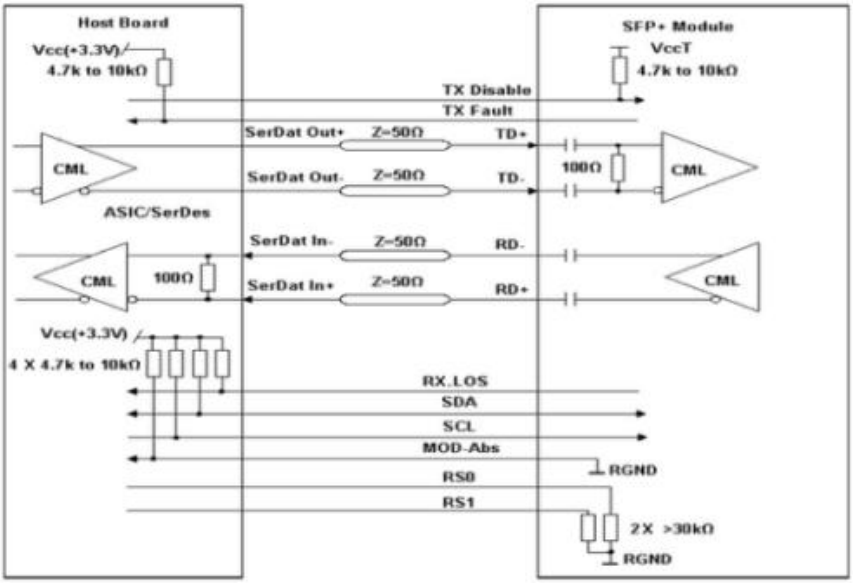


Figure 2, Recommended Interface Circuit

Pin arrangement

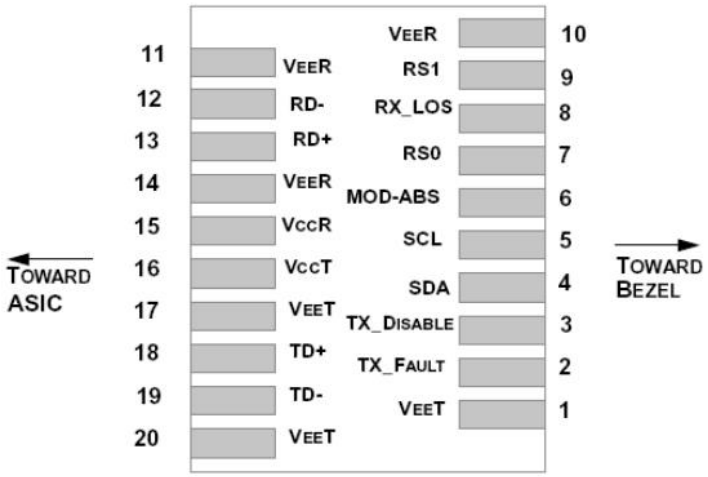


Figure 3, Pin View

Table 5-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 Line (MOD-DEF2)	
5	SCL	2-Wire Serial Interface Clock (MOD-DEF1)	

6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	2
7	RS0	Rate Select 0, optionally controls SFP+ module receiver	4
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as NOT Signal Detect)	2
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter	4
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 inverted data out put	
19	TD-	Transmitter non-inverted data out put	
20	VeeT	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.

Mechanical Design Diagram

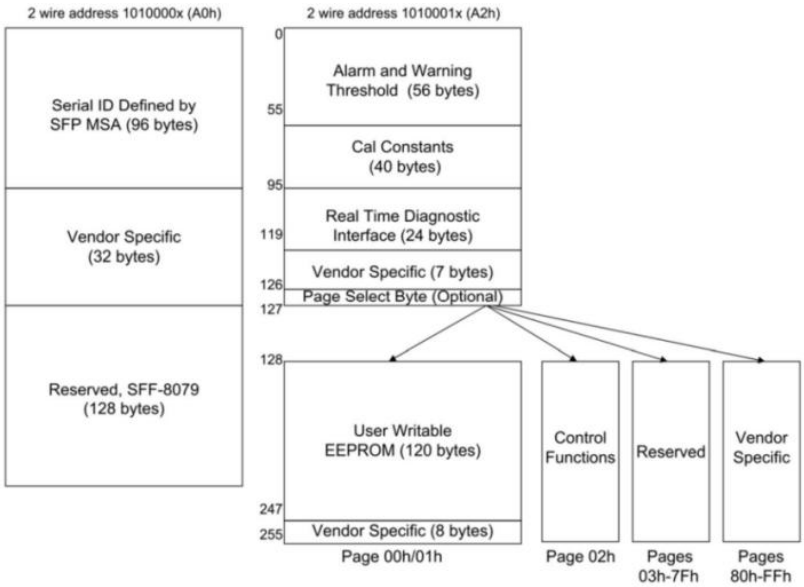
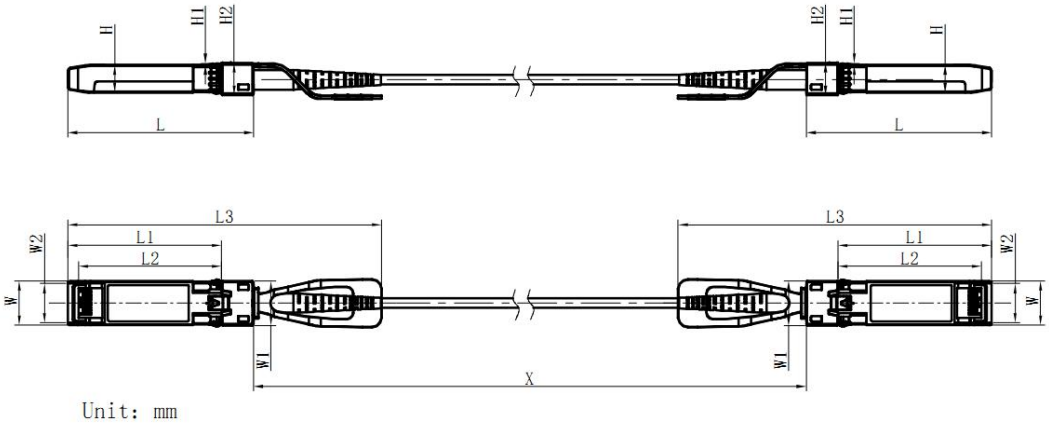


Figure 4, Memory Map

Mechanical



Unit: mm

	L	L1	L2	L3	W	W1	W2	H	H1	H2
MAX	57.75	48.0	44.65	102.5	13.75	14.0	12.25	8.65	0.55	10.4
Typical	57.55	47.8	44.45	101.5	13.65	13.9	12.15	8.55	0.5	10.2
MIN	57.35	47.6	44.25	100.5	13.55	13.8	12.05	8.45	0.45	10.0

Figure 5, Mechanical Diagram

Table 6-Cable Mechanical Specifications

Parameter	Value	Units
Diameter	3	mm
Minimum bend radius	30	mm
Length tolerance	Length < 1 m: +5 /-0	cm
	1 m ≤length ≤ 4.5 m: +15 / -0	cm
	5 m ≤length ≤ 14.5 m: +30 / -0	cm
	Length≥15.0 m +2% / -0	m
Cable color	Aqua(OM3),Megenta(OM4)	

Ordering information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance	Fiber Type	Connector	Temp
ECX-SFP28-AOC-XX-XM	25.78	850	0.5~100m	MMF	LC	0℃~+70℃