SFP Module 1.25G SINGLEMODE

Duplex LC Connector, 1310nm, VCSEL for Multimode Fibre, RoHS Compliant

APOLLO TECHNOLOGY

Features RoHS Pb

- 1310nm FP LD
- Data Rate: 1.25Gbps, NRZ
- Single +3.3V Power Supply
- RoHS Compliant and Lead-free
- AC/AC Differential Electrical Interface
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- Duplex LC Connector
- Compliance with specifications for IEEE-802.3z Gigabit Ethernet at 1.25 Gbps
- Compliance with ANSI specifications for Fibre Channel applications at 1.06 Gbps
- Eye Safety
  Designed to meet Laser Class 1, complies with EN60825-1

Applications

- Gigabit Ethernet Links
- Fibre Channel Links at 1.06 Gbps
- High Speed Backplane Interconnects
- Switched Backbones

Description

The SM SFP is a high performance and cost-effective module for serial optical data communication applications specified for single mode of 1.25 Gb/s. It operates on +3.3V power. The module is intended for single mode fibre, operates at a nominal wavelength of 1310nm, and complies with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP). Each module consists of a transmitter optical subassembly, a receiver optical subassembly, and an electrical subassembly. All are housed in a metal package and the combination produces a reliable component.

The module is a duplex LC connector transceiver designed for use in Gigabit Ethernet applicationsand to provide IEEE-802.3z compliant link for 1.25Gb/s intermediate reach applications.

Thecharacteristics are performed in accordance with Telcordia Specification GR-468-CORE.

EMC

Most equipment utilizing high-speed transceivers will be required to meet the following requirements:

1) FCC in the United States
2) CENELEC EN55022 (CISPR 22) in Europe

To assist the customer in managing the overall equipment EMC performance, the transceivers have been designed to satisfy FCC class B limits and provide good immunity to radio-frequency electromagnetic fields.

Eye Safety

The transceivers have been designed to meet Class 1 eye safety and comply with EN 60825-1.

PRODUCT INFORMATION

Model Number	Operating Voltage & SD Output	Distance	LD Type & Wavelength	Output Power	Sensitivity
SFP-S10	3.3V TTL AC/AC	10 km	1310 nm FP	-9.5 ~ -3 dBm	≤-21 dBm

ABSOLUTE MAX RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Storage Temperature	TS	-40	85	°C	
Supply Voltage	VCC	0	6	V	
Data Input Voltage	---	0	Vcc	V	
Supply Current	IS		300	mA	

OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Case Operating Temperature	T_A	0		70	°C	
Supply Voltage	VCC	3.1		3.5	V	
Data Input Voltage Swing	VID	300		1860	mV	

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Transmitter					
Transmitter Supply Current	I_{CCT}		200	mA	
Tx_ Disable Input Voltage - Low	V_{IL}	0	0.8	V	
Tx_ Disable Input Voltage - High	V_{IH}	2.0	Vcc	V	
Tx_ Fault Output Voltage - Low	VOL	0	0.8	V	
Tx_ Fault Output Voltage - High Receiver	VOH	2.0	Vcc	V	
Receiver Supply Current					
	I_{CCR}		100	mA	
Receiver Data Output Differential Voltage	V_{OD}	0.4	1.3	V	
Rx_LOS Output Voltage - Low	V_{OL}	0	0.8	V	
Rx_LOS Output Voltage - High	V_{OH}	2.0	Vcc	V	
MOD_DEF (1) , MOD_DEF (2) - Low	V_{IL}	-0.6	Vcc × 0.3	V	
MOD_DEF (1) , MOD_DEF (2) - High	V_{IH}	Vcc × 0.7	Vcc + 0.5	V	

TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power	Po	-9.5		-3	dBm	1
Extinction Ratio	ER	9			dB	
Center Wavelength	λ_c	1275			nm	
Spectral Width (RMS)	$\Delta\lambda$		1355		nm	2
RIN	RIN		3		dB/Hz	2
Optical Rise time (20%-80%)	t_r		-117		ps	
Optical Fall time (20%-80%)	t_f		260		ps	3
Output Eye			260			3
Compliant with IEEE802.3z/D5.0						

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	P_{max}	-3			dBm	4
Minimum Input Optical Power	P_{min}				dBm	4
Operating Wavelength	λ			-21	nm	
Optical Return Loss	ORL	1100 12		1600	dB	
Receiver Electrical 3dB Upper Cutoff Frequency	---			1500	MHz	
LOS of Signal - Asserted	P_A	-35			dBm	
LOS of Signal - Deasserted	P_D			-20	dBm	
Loss of Signal -Hysterisis	P_D -P_A	0.5			dB	

Notes:

1. Measured average power coupled into 9/125µm single mode Fibre.
2. In conformance with IEEE802.3z Figure 59-3 and FC-PI Figure 18.
3. These are 20-80% values.

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4. Measured with 2 -1 PRBS at BER<10

TIMING CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
TX_DISABLE Assert Time	t_off			10	µs
TX_DISABLE Negate Time	t_on			1	ms
Time to initialize, include reset of TX_FAULT	t_init			300	ms
TX_FAULT from fault to assertion	t_fault			100	µs
TX_DISABLE time to start reset	t_reset				µs
Receiver Loss of Signal Assert Time (off to on)					
Receiver Loss of Signal Assert Time (on to off)	t_{A,RX_LOS}			100	µs
	t_{D,RX_LOS}			100	