

SO-SFP-4GFC-70D-Cxx

SFP, 4/2/1 Gbps FC/FICON, CWDM, SM, DDM, 24dB, 70km

OVERVIEW

The SO-SFP-4GFC-70D-CXX series single mode transceiver is small form factor pluggable module for bi-directional serial optical data communications such as SONET OC-48 / SDH STM-16, Gigabit Ethernet 1000BASE and Fibre Channel SM-LC-L FC-PI. It is with the SFP 20-pin connector to allow hot plug capability. This module is designed for single mode fiber and operates at a nominal wavelength of CWDM wavelength. There are eighteen center wavelengths available from 1270nm to 1610nm, with each step 20nm. The transmitter section uses a multiple quantum well CWDM DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The SO-SFP-4GFC-70D-CXX series are designed to be compliant with SFF-8472 Multi-source Agreement (MSA).

PRODUCT FEATURES

- Operating data rate up to 4.25Gbps
- 18-Wavelength CWDM DFB LD transmitter from 1270nm to 1610nm, with Step 20nm
- Single 3.3V power supply and TTL control logic interface
- Hot-Pluggable SFP footprint duplex LC connector interface
- Class 1 FDA and IEC60825-1 laser safety compliant
- Operating temperature
 - Standard: 0°C~+70 °C
 - Industrial:-20 °C~+85 °C
- Compliant with SFP MSA specification
- Compliant with Digital Diagnostic Monitor (DDM) interface

APPLICATIONS

- 4/2/1Gbps Fibre Channel switch infrastructure
- Fast Ethernet, Gigabit Ethernet
- CWDM, SAN, WAN networking

ORDERING INFORMATION

Part Number	Description
SO-SFP-4GFC-70D-Cxx	SFP, 4/2/1 Gbps FC/FICON, CWDM, SM, DDM, 24dB, 70km
SO-SFP-4GFC-70D-Cxx -E	SFP, 4/2/1 Gbps FC/FICON, CWDM, SM, DDM, 24dB, 70km, extended.temp.

Subject to change without notice.

For more information, visit smaroptics.com.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TS	-40	+85	°C
Supply Voltage	VCC	-0.5	3.6	V
Operating Relative Humidity			95	%

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit	
Operating Case Temperature	TA	SO-SFP-4GFC-70D-Cxx	0		+70	°C
		SO-SFP-4GFC-70D-Cxx -I	-20		+85	°C
Power Supply Voltage	Vcc	3.15	3.3	3.45	V	
Power Supply Current	Icc			300	mA	
Data Rate	4FC		4.25		Gbps	
	2FC		2.125			
	FC		1.063			

PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Inputs(Differential)	V _{IN}	400		1600	mVpp	AC coupled inputs
Input Impedance (Differential)	Z _{IN}	85	100	115	ohms	R _{in} > 100 kohms @ DC
TX Disable	Disable	2		Vcc	V	
	Enable	0		0.8		
TX FAULT	Fault	2		Vcc+0.3	V	
	Normal	0		0.8		

PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Outputs (Differential)	V _{out}	400		1200	mVpp	AC coupled outputs
Output Impedance (Differential)	Z _{out}	85	100	115	ohms	
Rx_LOS Output Voltage – High		2		Vcc+0.3	V	
Rx_LOS Output Voltage – Low		0		0.8	V	
MOD_DEF (2:0)	VoH	2.5			V	With Serial ID
	VoL	0		0.5	V	

OPTICAL AND ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Power Budget		24			dB
Data Rate				4.25	Gbps

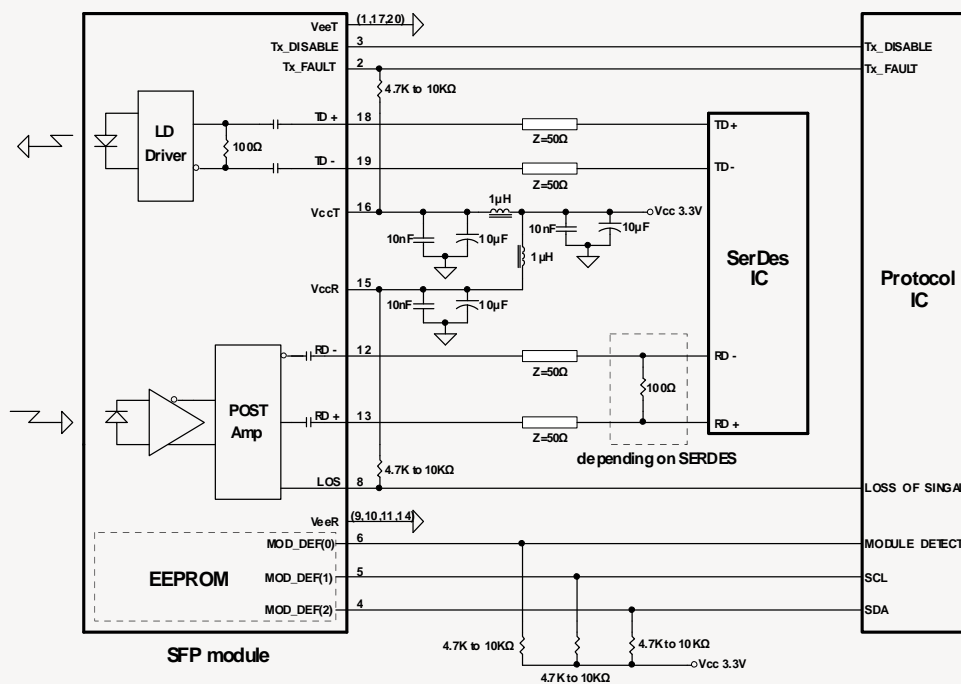
OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	$\lambda_c - 5.5$	λ_c	$\lambda_c + 7.5$	nm
Spectral Width (-20dB)	$\Delta\lambda$			1	nm
Average Output Power @9/125um SMF	P_{out}	0		5	dBm
Extinction Ratio@4.25Gb/s	ER	4.5			dB
Side Mode Suppression Ratio	SMSR	30			dB
Rise/Fall Time(Unfiltered 20%~80%)	t_r/t_f			120	ps
Output Optical Eye		ANSI Fiber Channel and Gigabit Ethernet Compliant			
TX Disable Assert Time	t_{off}			10	us
Pout@TX Disable Asserted	P_{out}			-45	dBm

OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ	1260		1600	nm
Receiver Sensitivity	P_{min}			-24	dBm
Receiver Overload	P_{max}	-9			dBm
Return Loss		12			dB
Optical Path Penalty				1	dB
LOS De-Assert	LOSD			-25	dBm
LOS Assert	LOSA	-35			dBm
LOS Hysteresis		0.5			dB

RECOMMENDED CIRCUIT SCHEMATIC



PIN FUNCTION DEFINITIONS

PIN	Signal Name	Description	PIN	Signal Name	Description
1	V _{EE} T	Transmitter Signal Ground	11	V _{EE} R	Receiver Signal Ground
2	TX_Fault	Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation	12	RD-	Inverse Receiver Data Out
3	TX_Disable	Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on.	13	RD+	Receiver Data Out
4	SDA	Modulation Definition 2 – Two wires serial ID Interface	14	V _{EE} R	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	V _{CC} R	Receiver Power – 3.3V±5%
6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	V _{CC} T	Transmitter Power – 3.3V±5%
7	RS0	RX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	17	V _{EE} T	Transmitter Signal Ground
8	RX_LOS	Loss of Signal Out (OC).	18	TD+	Transmitter Data In
9	RS1	TX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	19	TD-	Inverse Transmitter Data In
10	V _{EE} R	Receiver Signal Ground	20	V _{EE} T	Transmitter Signal Ground

MECHANICAL DRAWING

