4.25 Gbps Fibre Channel SFP Transceiver

SFPFC401



Features

- Designed for SFF-8472 compliance (SFP)
- 1.06 Gbps, 2.125 Gbps, and 4.25 Gbps Fibre Channel support
- Single-mode optics (Simplex LC)
- Dual fiber, bi-directional
- Class 1 laser: 1310 nm
- 10 km reach
- Digital Diagnostics (SFF-8724)

General Operations				
Parameter	**Symbol**	**Min.**	**Max.**	**Unit**
Supply Voltage	V_{cc}	3.135	3.465	V
Total Current	I_{cc}	-	300	mA
Power Supply Noise Rejection[a]	PSR	100	-	mV_{p-p}
Operating Temperature of SFP Case[b]	T_{op}	-5	70	°C
Storage Temperature	T_{st}	-40	85	°C
Data Rate FC-400 Fibre Channel	DR	-	4250	Mbps

a) 20 Hz to 155 MHz
b) Maximum Relative Humidity is 85%, non-condensing

Transmitter Specifications (Optical)				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Optical Power	P_{op}	-8.4	-1	dBm
Average Launch Power Of Off Tx	P_{off}	-	-30	dBm
Eye Mask	Fibre Channel[c] Compliant			
Optical Rise Time[d]	t_r	-	130	ps
Optical Fall Time[d]	t_f	-	130	ps
Mean Tx Wavelength: 1310	λ	1260	1360	nm
Spectral Width (20 dB)	$\Delta\lambda_{20}$	-	1	nm
Dispersion Penalty (10 km)[e]	dp	-	1	dB
Relative Intensity Noise	RIN	-	-120	dB/Hz
Reflection Tolerance[f]	rp	-24	-	dB

c) FC400 compliant
d) 20% - 80% values
e) Measured at BER of $1e^{-12}$, PRBS of 2^7-1, at eye center
f) 1 dB degradation of receiver sensitivity

Transmitter Specifications (Electical)				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Input Differential Impedence	R_{in}	80	120	Ω
PECL Single Ended Data Input Swing	$V_{in,p-p}$	250	1200	mV
TxFault_Fault	V_{fault}	2	V_{cc}	V
TxFault_Normal	V_{normal}	V_{ee}	V_{ee}+0.5	V
TxDisable_Disable	V_d	2	V_{cc}	V
TxDisable_Enable	V_{en}	V_{ee}	V_{ee}+0.8	V

Receiver Specifications (Optical)				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Receive Power[g]	$R_{sens,low/high}$	-18	0	dBm
Damage Threshold for Receiver	$P_{in,damage}$	4	-	dBm
Mean Rx Wavelength: 1310	λ	1260	1360	nm
Maximum Reflectance of Receiver	RX_r	-	-27	dB
LOS Assert	-	-30	-	dBm
LOS De-assert	-	-	-20	dBm
LOS Hysteresis	-	0.5	-	dB

g) at 4.25 Gbps, $1e^{-12}$ BER, PRBS 2^7-1

Receiver Specifications (Electrical)				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
PECL Single Ended Data Output Swing	$V_{out, p-p}$	185	800	mV
Data Output Rise Time	t_r	-	175	ps
Data Output Fall Time	t_f	-	175	ps

Timing and Electrical				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Tx Disable Negate Time	t_on	-	1	µs
Tx Disable Assert Time	t_off	-	10	µs
Time To Initialize, Including Reset of Tx Fault	t_init	-	300	ms
Tx Fault Assert Time	t_fault	-	100	µs
Tx Disable To Reset	t_reset	10	-	µs
LOS Assert Time	t_loss_on	-	100	µs
LOS De-assert Time	t_loss_off	-	100	µs
Serial ID Clock Rate	f_serial_clock	2	100	KHz
RX_LOS Voltage (High)	-	2	V_{cc}	V
RX_LOS Voltage (Low)	-	-	0.8	V
LOS Output Voltage-Fault	V_{LOS} fault	2	V_{cc}	V
LOS Output Voltage-Normal	V_{LOS}normal	V_{ee}	V_{ee}+0.5	V
MOD_DEF (0:2)-High	V_H	2	V_{cc}	V
MOD_DEF (0:2)-Low	V_L	V_{ee}	V_{ee}+0.5	V

Digital Diagnostics						
Parameter	**Range**	**Accuracy**	**Unit**	**Calibration**	**Bit Value**	**Formula**
Temperature	-5 to 70	± 3	° C	Internal	1/256 C	Tc(C)=Tad(16 bit signed twos complement)/256
Voltage	0 to V_{cc}	0.1	V	Internal	100µV	V(Volts)=Vad(16 bit unsigned integer)*0.1
Bias Current	0 to 120	5	mA	External	-	I(mA)=Islope*Iad(16 bit unsigned integer)+Ioffset
TX Power	-14 to -8	±3 dB	dBm	External	-	TX_PWR(µW)=TX_PWRslope*TX_PWRad(16 bit unsigned integer +TX_PWRoffset
RX Power	-28.2 to -8	±3 dB	dBm	External	-	RX_PWR(µW)=A0+A1*x+A2*x^2+A3*x^3+A4*x^4

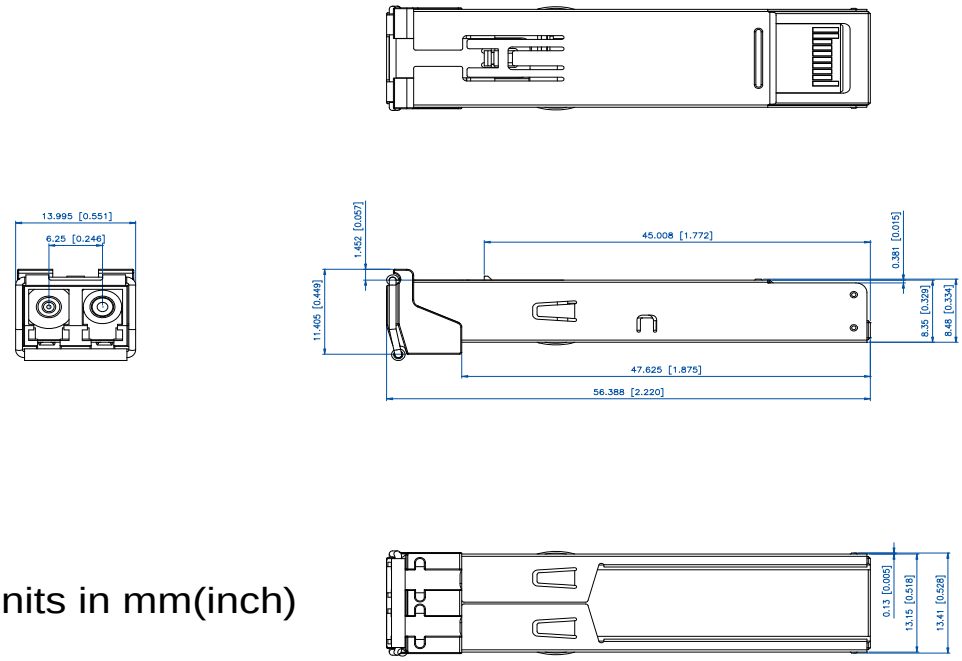
Pin	Function	Notes
1	$V_{ee}T$	TX GND
2	TX_FAULT	Open Collector
3	TX_DISABLE	Internally Pulled High
4	MOD_DEF2	Serial Data Input
5	MOD_DEF1	Serial Clock Input
6	MOD_DEF0	Internally Grounded
7	NC	Not Connected
8	LOS	Open Collector
9	$V_{ee}R$	RX Ground
10	$V_{ee}R$	RX Ground
11	$V_{ee}R$	RX Ground
12	RXD-	RX Data Negative
13	RXD+	RX Data Positive
14	$V_{ee}R$	RX GND
15	V_{ccR}	RX Power
16	V_{ccT}	TX Power
17	$V_{ee}T$	TX GND
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	$V_{ee}T$	TX GND

Ordering Information							
Model	**Description**	**Data Rate (Mbps)**	**Wavelength (nm)**		**Connector Type**	**Bail Latch Color**	**Distance Range (km)**
			Tx	**Rx**			
SFPFC401	1/2/4 Gbps Fibre Channel and 1 Gigabit Ethernet SFP Tranceiver.	1063 2125 4250	1310	1310	LC	Yellow	0 - 10

Connectivity Unlimited™

Datasheet

Outline Drawing



Units in mm(inch)

Regulatory Compliances

RoHS directive; China RoHS; California RoHS Law, USA and Canada UL listing; 21CFR 1040.10 and 1040.11; SFP MSA SFF-8074i; SFF-8472; Telecordia GR-468

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic descharge (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 indeirect radiation.

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