



1.25G 2x5 SFF 1000BASE-LX Transceiver **Duplex LC, 1310nm FP, SMF 10KM**

Part Number: FSF1-C7-S13-10T



Overview

FSF1-C7-S13-10T is a 2x5 SFF package transceiver with duplex LC connector, compliant with the industrial standard specification. The high performance uncooled 1310nm FP transmitter and high sensitivity PIN receiver provide superior performance for Gigabit Ethernet 1000BASE-LX and Fiber Channel 1GFC application up to SMF 10km optical links.

Applications

- Gigabit Ethernet 1000BASE-LX @1.25G
- Fiber Channel 1GFC @1.0625G

Features

- Compliant with IEEE802.3z Gigabit Ethernet
- Compliant with Fiber Channel 100-SM-LC-L
- Compliant with SFF MSA-2000
- Industry Standard 2x5 SFF Footprint
- 1310nm FP laser transmitter
- Duplex LC connector
- AC-coupled LVPECL Differential inputs and outputs
- LVTTTL Signal Detection output
- Single +3.3V power supply
- Link distance 10km over SM fiber
- RoHS Compliant

Laser Safety

- This is a Class 1 Laser Product complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.
- Caution: Use of control or adjustments or performance of procedure other than those specified herein may result in hazardous radiation exposure.



Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	T _{ST}	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage	V _{CC}	-0.5	+4.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (FSF1-C7-S13-10T)	T _{OP}	0	-	+70	°C
Case Operating Temp. (FSF1-C7-S13-10Ti)	T _{OP}	-40	-	+85	°C
Supply Voltage	V _{CC}	+3.13	+3.3	+3.47	V
Supply Current (FSF1-C7-S13-10T)	I _{CC}			270	mA
Supply Current (FSF1-C7-S13-10Ti)	I _{CC}			300	mA
Power Consumption (3.3V)	P			1	W
Lead Soldering Limits	T _{Sold}			260/10	°C/Sec

Transmitter Electro-optical Characteristics

V_{CC}= 3.13V~3.47V, T_{OP} = 0 °C to 70 °C(FSF1-C7-S13-10T); T_{OP} = -40 °C to 85 °C(FSF1-C7-S13-10Ti)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		1250		Mb/s	
Optical Launch Power	P _O	-9		-3	dBm	1
Optical Center Wavelength	λ _C	1260	1310	1360	nm	
Spectral Width (RMS)	Δλ			4	nm	
Optical Extinction Ratio	ER	9			dB	
Optical Eye Mask		IEEE802.3z				
Differential Data Input Swing	V _{IN}	500		2400	mV	
Tx Disable Input Voltage-Low (Tx ON)	TDISV _L	GND		0.8	V	
Tx Disable Input Voltage-High (Tx OFF)	TDISV _H	2.0		V _{CC}	V	

Note1: The optical power is launched into a 9/125μm single mode fiber.

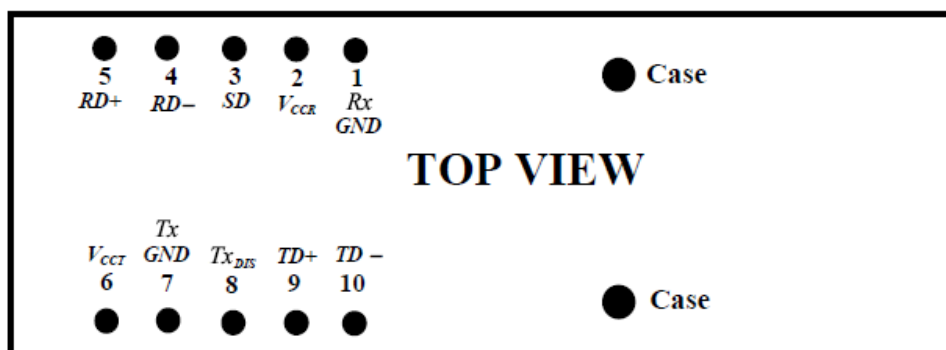
Receiver Electro-optical Characteristics

$V_{CC} = 3.13V \sim 3.47V$, $T_{OP} = 0\text{ }^{\circ}C \text{ to } 70\text{ }^{\circ}C$ (FSF1-C7-S13-10T); $T_{OP} = -40\text{ }^{\circ}C \text{ to } 85\text{ }^{\circ}C$ (FSF1-C7-S13-10Ti)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		1250		Mb/s	
Receiver Sensitivity	SEN			-23	dBm	1
Maximum Receive Power	PRX-MAX	-3			dBm	1
Optical Center Wavelength	λ_c	1260		1600	nm	
Signal Detect De-Assert	SD _D	-45			dBm	
Signal Detect Assert	SD _A			-23	dBm	
Signal Detect LOS Hysteresis	SD _{HY}	0.5		5	dB	
Differential Data Output Swing	V _{OUT}	370		2000	mV	
Signal Detect Output Voltage Low	LOS _V L	GND		0.8	V	
Signal Detect Output Voltage High	LOS _V H	2.0		V _{CC}	V	

Note1: Measured with a PRBS 2⁷-1 test pattern @1.25Gbps BER<10⁻¹².

Pin Assignment



Pin Description

Pin	Name	Function / Description
1	Rx GND	Receiver Signal Ground
2	V _{CCR}	Receiver Power Supply
3	SD	Signal Detect Output. H--Normal Operation; L--Los Of Signal
4	RD-	Receiver Data Out Bar
5	RD+	Receiver Data Out

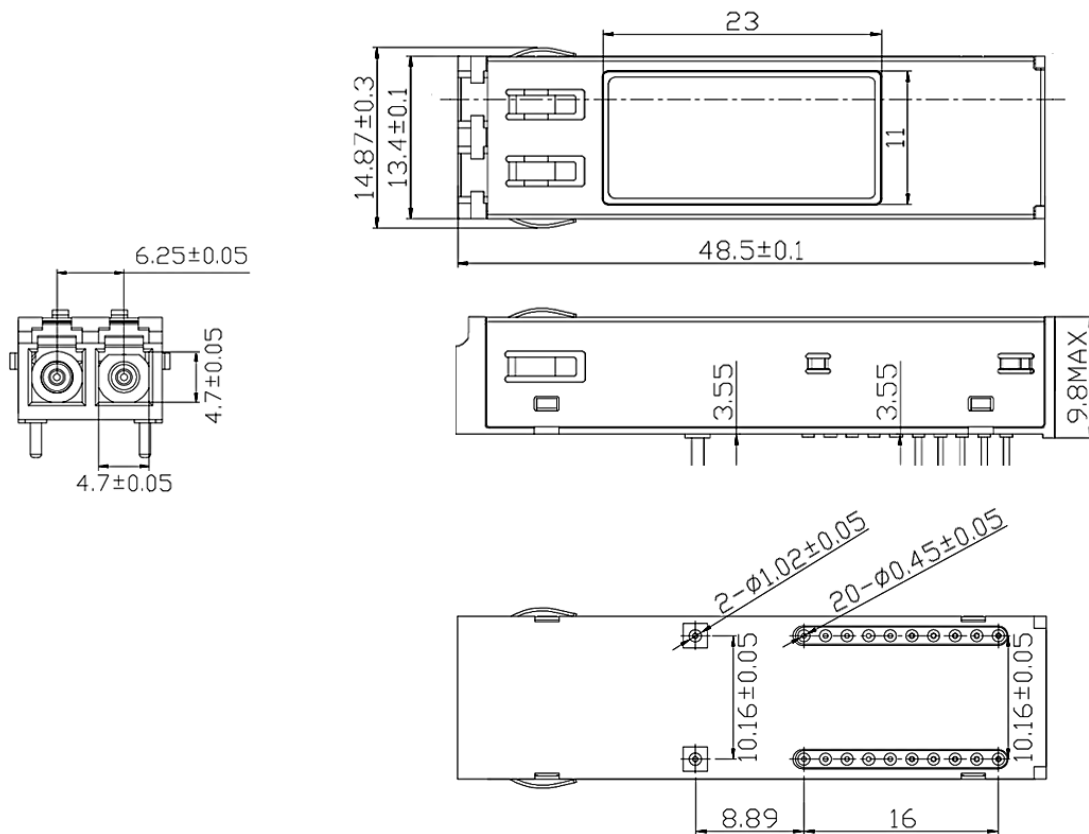


6	V _{CC} T	Transmitter Power Supply
7	Tx GND	Transmitter Signal Ground
8	TXDIS	Transmitter Disable Control. High level Tx off.
9	TD+	Transmitter Data In
10	TD-	Transmitter Data In Bar

Note1: Signal Detect is a basic fiber failure indicator. This is a single-ended LVTTTL output. As the input optical power is decreased, Signal Detect will switch from high to low (de-assert point) somewhere between sensitivity and the no light input level. As the input optical power is increased from very low levels, Signal Detect will switch back from low to high (assert point).

Note2: Transmitter Disabled: $(V_{CC}T - 1.3V) < V < V_{CC}T$; Transmitter Enabled: $TX\ GND < V < (TX\ GND + 0.8V)$ or open circuit.

Mechanical Dimensions



(All Dimensions are ± 0.20 mm Unless Otherwise Specified, Unit: mm)



Ordering Information

Part No.	Tx	Rx	Conn.	I/O	SD	Link	Voltage	Temp.
FSF1-C7-S13-10T	1310nm	1260nm ~ 1600nm	Duplex LC	AC/AC	LVTTL	SMF 10km	3.3V	0~70°C
FSF1-C7-S13-10Ti								-40~85°C

Note: Distances are indicative only. To calculate a more precise link budget based on specific conditions in your application, please refer to the optical characteristics.