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SKU: 03GFA16

125M / 155M SFF 2X5 100BASE-ZX Transceiver
Duplex LC, 1550nm DFB, SMF 100km, I-Temp
DC/DC I/O, LVPECL Signal Detection

Part Number: FSF1-A7-S15-A0Pi



Overview

FSF1-A7-S15-A0Pi is a 2X5 SFF package transceiver with duplex LC connector, compliant with the industrial standard specification. The high performance uncooled 1550nm DFB transmitter and high sensitivity PIN receiver provide superior performance for SDH STM-1 / SONET OC-3 and Fast Ethernet 100BASE-ZX applications up to SMF 100km optical links in Industrial Temperature range.

Applications

- Fast Ethernet 100BASE-ZX @125M
- SONET OC-3 / SDH STM-1 @155M

Features

- Compatible with Fast Ethernet 100BASE-ZX
- Compatible with SONET OC-3 LR-2 and SDH STM-1 L1.2
- Compliant with SFF MSA-2000
- Industry Standard SFF 2X5 Footprint
- 1550nm DFB transmitter & PIN receiver
- Duplex LC connector
- DC-coupled LVPECL Differential inputs and outputs
- LVPECL Signal Detection output
- Single +3.3V power supply
- Link distance 100km over SM fiber
- Operating Temperature -40~+85°C
- Maximum Power consumption 1W
- 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.

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Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	T_{ST}	-40	+85	°C
Relative Humidity	RH	5	85	%
Supply Voltage	V_{CC}	-0.5	+3.6	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temperature	T_{OP}	-40	-	+85	°C
Supply Voltage	V_{CC}	+3.13	+3.3	+3.47	V
Supply Current	I_{CC}			300	mA
Power Consumption	P			1	W
Lead Soldering Limits	T_{Sold}			260/10	°C/Sec

Transmitter Electro-optical Characteristics

V_{CC} = 3.13V to 3.47V, T_{OP} = -40 °C to +85 °C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Line Rate		50	155	200	Mb/s	
Optical Launch Power	Po	-4		+1	dBm	1
Optical Center Wavelength	λc	1530	1550	1570	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Extinction Ratio	ER	10			dB	
Optical Eye Mask		IEEE 802.3ah and ITU-T G.957				
Relative Intensity Noise	RIN			-115	dB/Hz	
Tx Disable Input Voltage-Low (Tx ON)	$TDISV_L$	0		0.8	V	
Tx Disable Input Voltage-High (Tx OFF)	$TDISV_H$	2.0		Vcc	V	
Data Input Voltage-Low	V_{IL}-V_{CC}	-2.0		-1.58	V	
Data Input Voltage-High	V_{IH}-V_{CC}	-1.1		-0.74	V	

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

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Receiver Electro-optical Characteristics

V_{CC} = 3.13V to 3.47V, T_{OP} = -40 °C to +85 °C

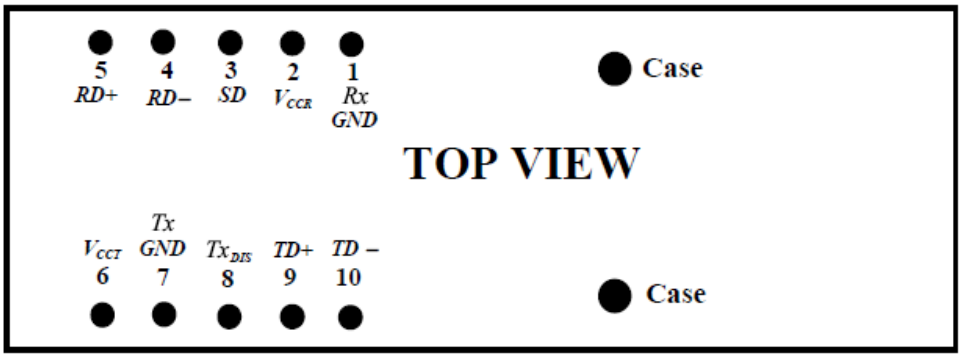
Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Line Rate		50	155	200	Mb/s	
Receiver Sensitivity	SEN			-34	dBm	1
Maximum Receive Power	P_{RX-MAX}	0			dBm	1
Optical Center Wavelength	λc	1260		1610	nm	
Signal Detect De-Assert	SD_D	-45			dBm	
Signal Detect Assert	SD_A			-34	dBm	
Signal Detect LOS Hysteresis	SD_{HY}	0.5		6	dB	
Signal Detect Output Voltage Low	V_{SDL}-V_{CC}	-2.0		-1.58	V	
Signal Detect Output Voltage High	V_{SDH}-V_{CC}	-1.1		-0.74	V	
Data Output Voltage-Low	V_{OL}-V_{CC}	-2.0		-1.58	V	
Data Output Voltage-High	V_{OH}-V_{CC}	-1.1		-0.74	V	

Note1: Measured with a PRBS 2^7-1 test pattern @1.25Gbps BER<10^{-12}.

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Pin Assignment



Pin Description

Pin	Name	Function / Description
1	Rx GND	Receiver Signal Ground
2	VCCR	Receiver Power Supply
3	SD	Signal Detect Output. (High=Normal Operation; Low=Loss of Signal)
4	RD-	Receiver Data Out Bar
5	RD+	Receiver Data Out
6	VCCT	Transmitter Power Supply
7	Tx GND	Transmitter Signal Ground
8	TXDIS	Transmitter Disable Control. (High=Tx off; Low=Tx on)
9	TD+	Transmitter Data In
10	TD-	Transmitter Data In Bar

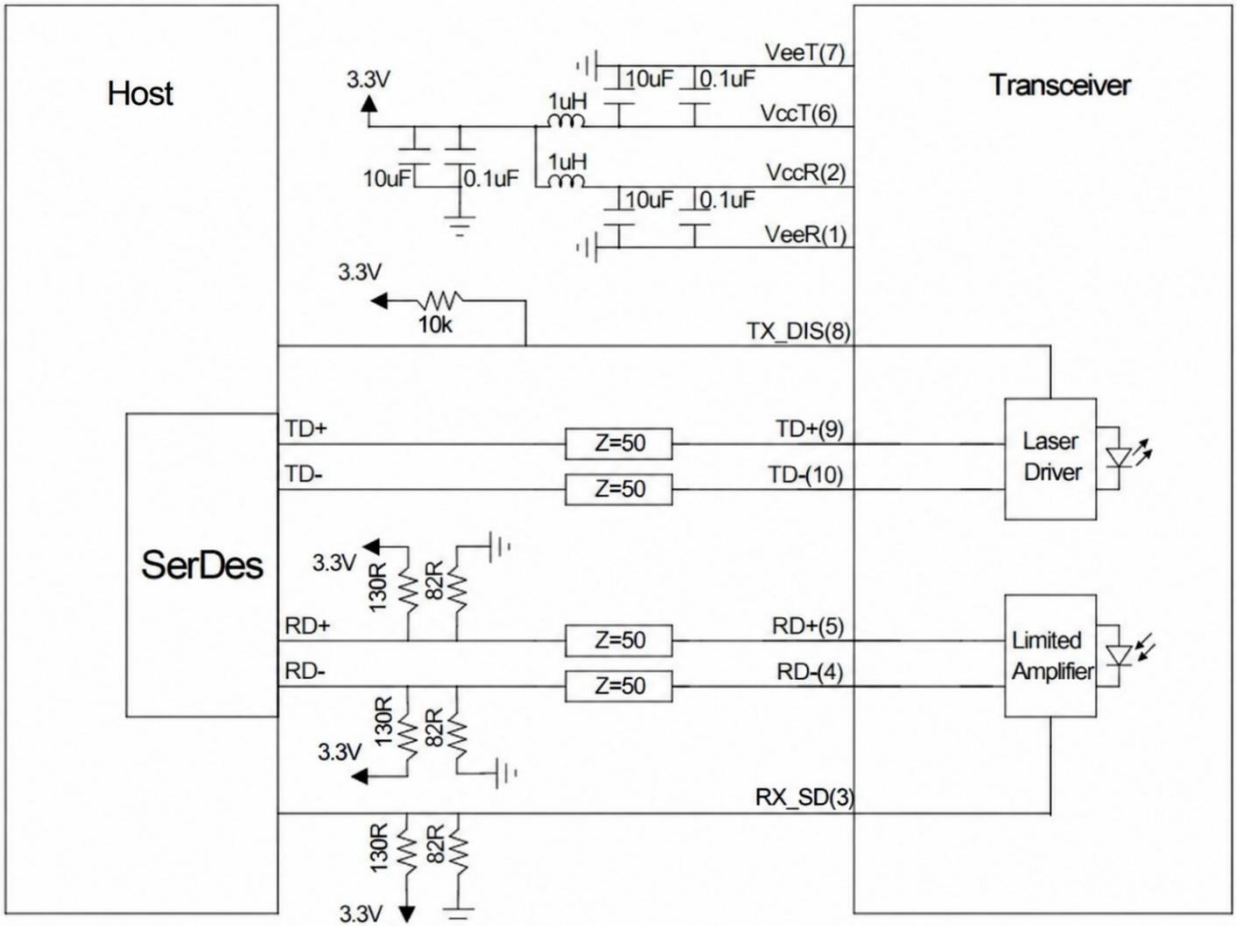
Note1: Signal Detect is a basic fiber failure indicator. This is a single-ended LVPECL output. As the input optical power is decreased, Signal Detect will switch from high to low (de-assert point) somewhere between sensitivity and the no light input level. As the input optical power is increased from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

Note2: Transmitter Disabled: (VccT-1.3V)<V<VccT ; Transmitter Enabled: TX GND<V<(TX GND+0.8V) or open circuit.

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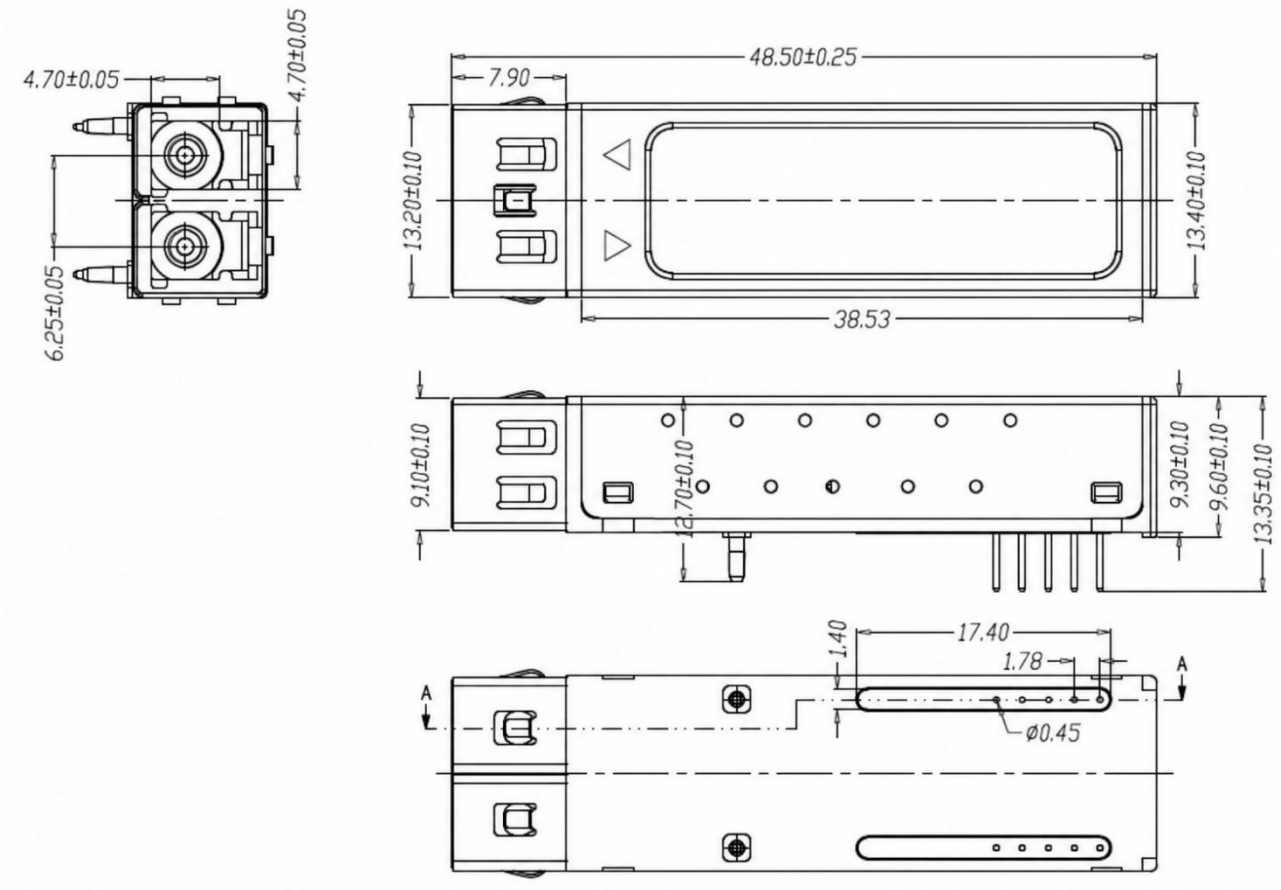
Recommended Circuit



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Mechanical Dimensions



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

Ordering Information

Part No.	Tx	Rx	Conn.	I/O	SD	Link	Voltage	Temp.
FSF1-A7-S15-A0Pi	1550nm	1260nm ~ 1610nm	Duplex LC	DC/DC	LVPECL	SMF 100km	3.3V	-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.

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