



**Features**

- „ SFP Multi-Source Agreement compliance
- „ Compliant with IEEE802.3z Gigabit Ethernet Standard
- „ Compliant with Fiber Channel 100-SM-LL-L standard
- „ Industry standard small form pluggable (SFP) package
- „ Duplex LC connector
- „ Differential PECL inputs and outputs
- „ Single power supply 3.3V
- „ TTL signal detect indicator
- „ Hot Pluggable
- „ Class 1 laser product complies with EN 60825-1
- „ RoHS compliant

**Application**

- „ Distributed multi-processing
- „ Switch to switch interface
- „ High speed I/O for file server
- „ Bus extension application
- „ Channel extender, data storage

**Ordering Information**

<i>Model Number</i>	<i>Reach</i>	<i>Input/Out</i>	<i>Signal Detect</i>	<i>Voltage</i>	<i>Temperature</i>
ESSFP-ZX	70 km	AC/AC	TTL	3.3V	0 °C to 70 °C
ESSFP-ZX-I	70 km	AC/AC	TTL	3.3V	-40 °C to 85 °C

**Note: All information contained in this document is subject to change without notice.**

**Absolute Maximum Ratings**

<i>Parameter</i>	<i>Symbol</i>	<i>Min.</i>	<i>Max.</i>	<i>Units</i>	<i>Note</i>
Storage Temperature	$T_S$	-40	85	°C	
Supply Voltage	$V_{CC}$	-0.5	4.0	V	
Input Voltage	$V_{IN}$	-0.5	$V_{CC}$	V	
Output Current	$I_o$	---	50	mA	
Operating Current	$I_{OP}$	---	400	mA	

**Recommended Operating Conditions**

<i>Parameter</i>	<i>Symbol</i>	<i>Min.</i>	<i>Max.</i>	<i>Units</i>	<i>Note</i>
Case Operating Temperature	$T_C$	0	70	°C	ESSFP-ZX
		-40	85	°C	ESSFP-ZX-I
Supply Voltage	$V_{CC}$	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	---	300	mA	

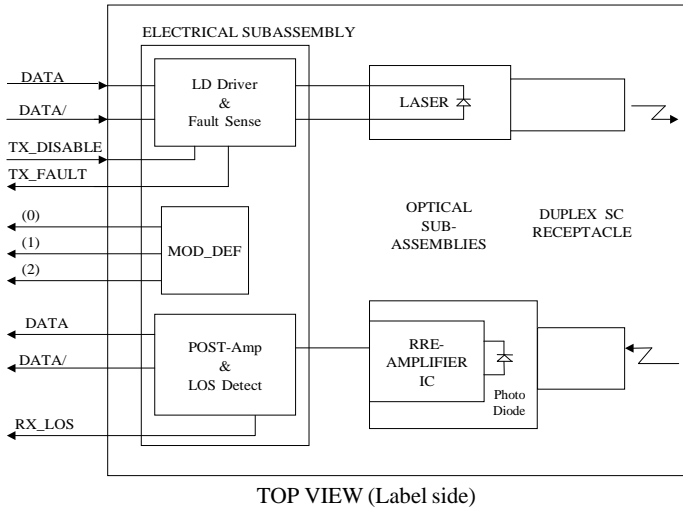
**Transmitter Electro-optical Characteristics**
 **$V_{CC} = 3.1 \text{ V to } 3.5 \text{ V}$ ,  $T_C = 0 \text{ }^\circ\text{C to } 70 \text{ }^\circ\text{C}$  ( $-40 \text{ }^\circ\text{C to } 85 \text{ }^\circ\text{C}$ )**

<i>Parameter</i>	<i>Symbol</i>	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	<i>Units</i>	<i>Note</i>
Output Optical Power 9/125 $\mu\text{m}$ fiber	$P_{out}$	0	---	+5	dBm	Average
Extinction Ratio	$ER$	7	---	---	dB	
Center Wavelength	$\lambda_c$	1530	1550	1570	nm	
Spectral Width (-20dB)		---	---	1	nm	
Side Mode Suppression Ratio	$SMSR$	30	---	---	dB	
Rise/Fall Time, (20–80%)	$T_{r, f}$	---	---	260	ps	
Relative Intensity Noise	$RIN$	---	---	-120	dB/Hz	
Total Jitter	$TJ$	---	---	227	ps	
Output Eye						Compliant with IEEE802.3z
Max. $P_{out}$ TX-DISABLE Asserted	$P_{OFF}$	---	---	-45	dBm	
Differential Input Voltage	$V_{DIFF}$	0.4	---	2.0	V	

**Receiver Electro-optical Characteristics**
**V<sub>CC</sub> = 3.1 V to 3.5 V, T<sub>C</sub> = 0 °C to 70 °C (-40 °C to 85 °C)**

<i>Parameter</i>	<i>Symbol</i>	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	<i>Units</i>	<i>Note</i>
Optical Input Power-maximum	$P_{IN}$	-3	---	---	dBm	BER < 10 <sup>-12</sup>
Optical Input Power-minimum (Sensitivity)	$P_{IN}$	---	-27	-24	dBm	BER < 10 <sup>-12</sup>
Operating Center Wavelength	$\lambda_c$	1260	---	1610	nm	
Optical Return Loss	$ORL$	12	---	---	dB	
Signal Detect-Asserted	$P_A$	---	---	-24	dBm	
Signal Detect-Deasserted	$P_D$	-35	---	---	dBm	
Differential Output Voltage	$V_{DIFF}$	0.5	---	1.2	V	
Data Output Rise, Fall Time (20–80%)	$T_{r, f}$	---	---	0.35	ns	
Receiver Loss of Signal Output Voltage-Low	$RX\_LOS_L$	0	---	0.5	V	
Receiver Loss of Signal Output Voltage-High	$RX\_LOS_H$	2.4	---	VCC	V	

Block Diagram of Transceiver



**Transmitter Section**

The transmitter section consists of a 1550 nm InGaAsP laser in an eye safe optical subassembly (OSA) which mates to the fiber cable. The laser OSA is driven by a LD driver IC which converts differential input LVPECL logic signals into an analog laser driving current.

**TX\_DISABLE**

The TX\_DISABLE signal is high (TTL logic “1”) to turn off the laser output. The laser will turn on when TX\_DISABLE is low (TTL logic “0”).

**Receiver Section**

The receiver utilizes an InGaAs PIN photodiode mounted together with a trans-impedance preamplifier IC in an OSA. This OSA is connected to a circuit providing post-amplification quantization, and optical signal detection.

**Receive Loss (RX\_LOS)**

The RX\_LOS is high (logic “1”) when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level.

Dimensions

