



Features

- „ SFP Multi-Source Agreement compliance
- „ Compliant with IEEE802.3z Gigabit Ethernet standard
- „ Compliant with Fiber Channel 100-SM-LC-L standard
- „ Industry standard small form pluggable (SFP) package
- „ Duplex LC connector
- „ Differential LVPECL 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/Output</i>	<i>Signal Detect</i>	<i>Voltage</i>	<i>Temperature</i>
ESSFP-LX	10 km	AC/AC	TTL	3.3V	0°C to 70 °C
ESSFP-LX-I	10 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-LX
		-40	85	°C	ESSFP-LX-I
Supply Voltage	V_{CC}	3.1	3.5	V	
Supply Current	$I_{TX} + I_{RX}$	---	250	mA	

Transmitter Electro-optical Characteristics
V_{CC} = 3.1 V to 3.5 V, T_C = 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>
Output Optical Power (9/125µm fiber)	P_{out}	-9.5	---	-3	dBm	Average
Extinction Ratio	ER	9	---	---	dB	
Center Wavelength	λ_c	1270	1310	1355	nm	
Spectral Width (RMS)		---	---	2.5	nm	
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	

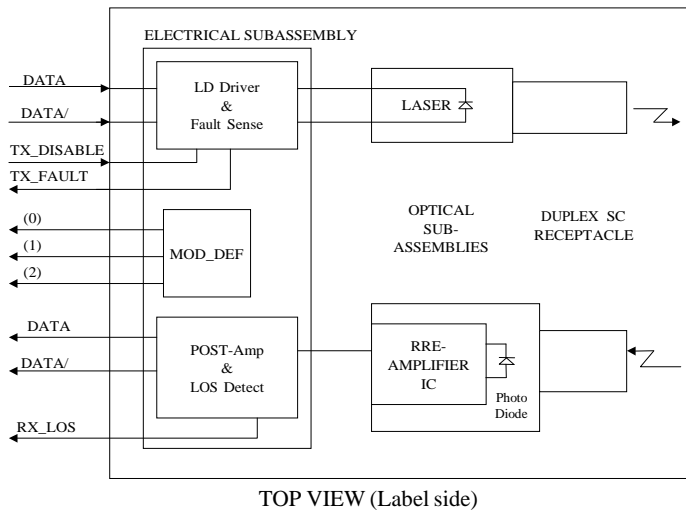
Receiver Electro-optical Characteristics
V_{CC} = 3.1 V to 3.5 V, T_C = 0 °C to 70 °C (-40 °C to 85 °C)

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Optical Input Power-maximum	P_{IN}	-3	---	---	dBm	BER < 10 ⁻¹²
Optical Input Power-minimum (Sensitivity)	P_{IN}	---	---	-20	dBm	BER < 10 ⁻¹²
Operating Center Wavelength	λ_c	1260	---	1610	nm	
Optical Return Loss	ORL	12	---	---	dB	
Signal Detect-Asserted	P_A	---	---	-20	dBm	
Signal Detect-Deasserted	P_D	-35	---	---	dBm	
Stressed Receiver Sensitivity		---	---	-14.4	dBm	Note 1,2
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	---	V_{CC}	V	

 Note 1: Measured with conformance test signal at TP3 for BER = 10⁻¹² at the eye center.

Note 2: Measured with a transmit signal having a 9 dB extinction ratio. If another extinction ratio is used, the Stressed receiver sensitivity should be corrected for the extinction ratio penalty

Block Diagram of Transceiver



Transmitter Section

The transmitter section consists of a 1310 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

