3.3V SFP LC Transceiver for Fibre Channel & 1000Base-SX
850nm VCSEL for Multimode Fiber

EMxxx-LP3TA-zz
Data Sheet

Features

- **850nm Vertical Cavity Surface Emitting Laser (VCSEL) Source Technology**
- **Compliant with specifications for IEEE-802.3z Gigabit Ethernet (1000Base-SX) at 1.25 Gbps**
- **Compliant with ANSI specifications for Fibre Channel applications at 1.06 Gbps**
- **Compliant with Small Form-factor Pluggable (SFP) Multi-Source Agreement**
- **Compatible with Industry Standard RFT Electrical Connector & Cage**
- **LC Receptacle Compatible with Industry Standard LC Optical Connector**
- **Operates with 50 µm and 62.5 µm multimode optical fibers**
- **Class 1 Laser Safety Compliant**
- **Single +3.3V Power Supply**
- **Hot Pluggable**
- **EEPROM with Serial ID Functionality**

Product Description

The EMxxx-LP3 from E2O Communications is a hot-pluggable 3.3V Small Form-Factor transceiver designed for use in Fibre Channel and Gigabit Ethernet applications. The EMxxx-LP3 transceivers provide the LC optical receptacle that is compatible with the industry standard LC connector. The transceiver is also compatible with industry standard RFT connector and cage.

The transceiver conforms to the Small Form-factor Pluggable (SFP) multi-source agreement (MSA).

Each EMxxx-LP3 transceiver consists of an optical subassembly housing both the transmitter and the receiver, and an electrical subassembly. All are packaged together with a top metal cover and bottom shield. The transmitter consists of a high-performance 850-nm VCSEL while the receiver consists of a GaAs PIN and a pre-amplifier.

A serial EEPROM in the transceiver allows the user to access information. Details of the Serial Identification Protocol will be contained in the SFP Multi-Source Agreement. All EMxxx-LP3 transceivers include a loss-of-Signal-Detect circuit, which provides a TTL logic high output when an unusable input optical signal level is detected.

Electromagnetic Interference (EMI) & Immunity

To assist the customer in managing the overall equipment EMI performance, the EMxxx-LP3 transceiver is designed to be compatible with the industry-standard RFT cage. The RFT cage is designed to provide protection for EMI emission and EMI susceptibility. All transceivers comply with the FCC Class B limits.

Eye Safety

The EMxxx-LP3 850-nm VCSEL-based transceivers have been designed to meet Class 1 eye safety and comply with FDA 21CFR 1040.10 and 1040.11and the IEC 825-1.

Ordering Information

EMxxx-LP3 T A- zz

- zz (Actuator)
  - MS = MSA Compliant
  - MK = Extended Actuator
  - MB = Bail Latch
- A (Coupling)
  - A = AC
- T (Loss of Signal Detect)
  - T = TTL
- xxx (Data Rate)
  - 106= Fibre Channel
  - 125= Gigabit Ethernet

EB-SFP-A (Evaluation Board)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
Storage Temperature	T_S	-40		85	°C	
Supply Voltage	V_{CC}			5.0	V	Vcc – ground

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
Ambient Operating Temperature	T_A	0		70	°C	
Supply Voltage	V_{CC}	3.1		3.5	V	
Transmitter Differential Input Voltage	V_D	0.6		2.0	V	

ELECTRICAL CHARACTERISTICS (T_A = 0°C to 70°C, V_{CC} = 3.15V to 3.45V)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
TRANSMITTER						
Supply Current	I_{CCT}		80	100	mA	
RECEIVER						
Supply Current	I_{CCR}		100	200	mA	
Data Output Peak-to-Peak Differential Voltage	$V_{O,P-P}$	0.5		1.9	V	
Data Output Rise & Fall Times	t_r,t_f			0.40	ns	20-80%
Loss Signal Detect Output - High	Voh	2.0		Vcc	V	
Loss Signal Detect Output - Low	Vol	0.0		0.5	V	

OPTICAL CHARACTERISTICS (T_A = 0°C to 70°C, V_{CC} = 3.15V to 3.45V)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
TRANSMITTER						
Output Optical Power 50/125 µm, NA = 0.20 fiber	P_{OUT}	-9.5		-4	dBm avg.	
Output Optical Power 62.5/125 µm, NA = 0.275 fiber	P_{OUT}	-9.5		-4	dBm avg.	
Optical Extinction Ratio		9			dB	
Center Wavelength	λ_c	840	850	860	nm	
Spectral Width – rms	σ			0.85	nm	
Optical Rise/Fall Time	t_r / t_f			0.26	ns	20-80%
Optical Modulation Amplitude	OMA	160			µW	Pk to Pk Applies to FC
Relative Intensity Noise	RIN		-122	-117	dB/Hz	
Transmitter Optical Contributed Jitter (TOTAL)	TJ			225	ps	
RECEIVER						
Minimum Optical Input Power (Sensitivity)	P_{IN} Min			-17	dBm avg.	
Maximum Optical Input Power (Saturation)	P_{IN} Max	0			dBm avg.	
Operating Center Wavelength	λ_c	770		860	nm	
Optical Modulation Amplitude	OMA	31			µW	Pk to Pk Applies to FC
Return Loss		12			dB	
Signal Detect – Asserted	P_A			-17	dBm avg.	
Signal Detect – Deasserted	P_D	-30			dBm avg.	
Signal Detect – Hysteresis	P_A - P_D	0.5		5.0	dB	

Figure 1: SFP Transceiver Package Outline
(-MS Version shown)

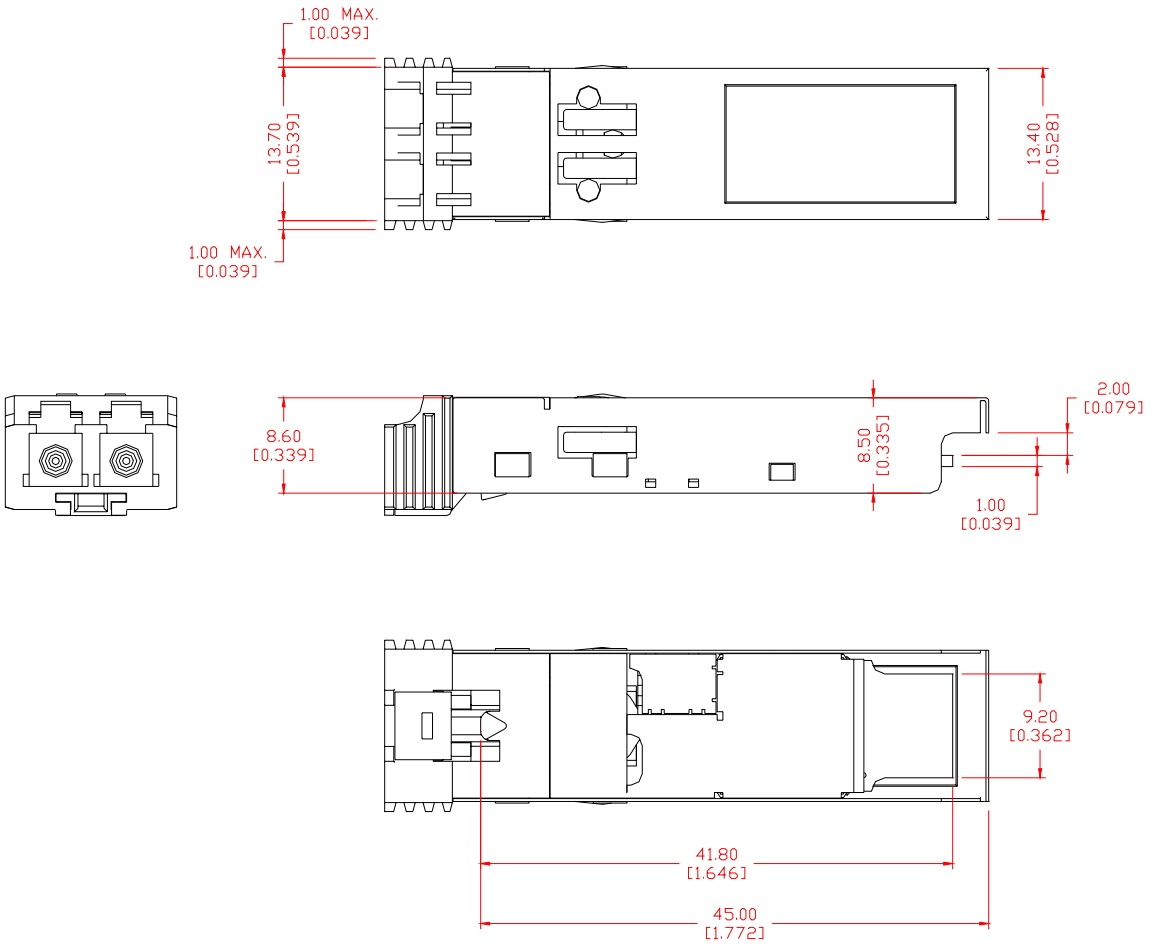


Figure 2: -MK Actuator Details (mm[inches])

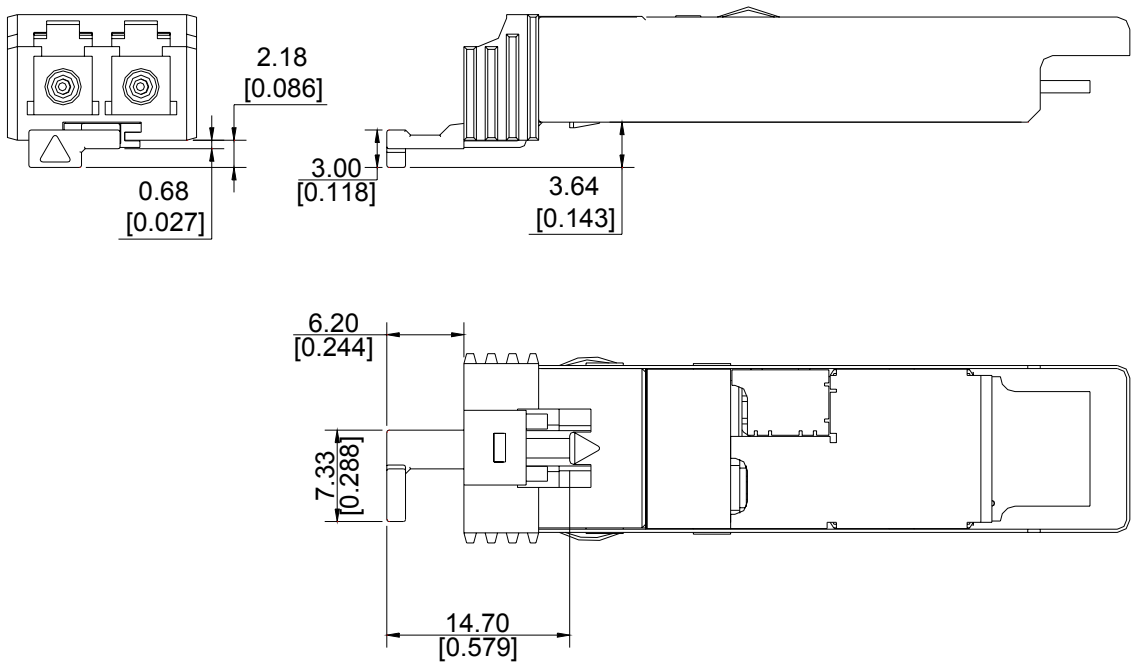
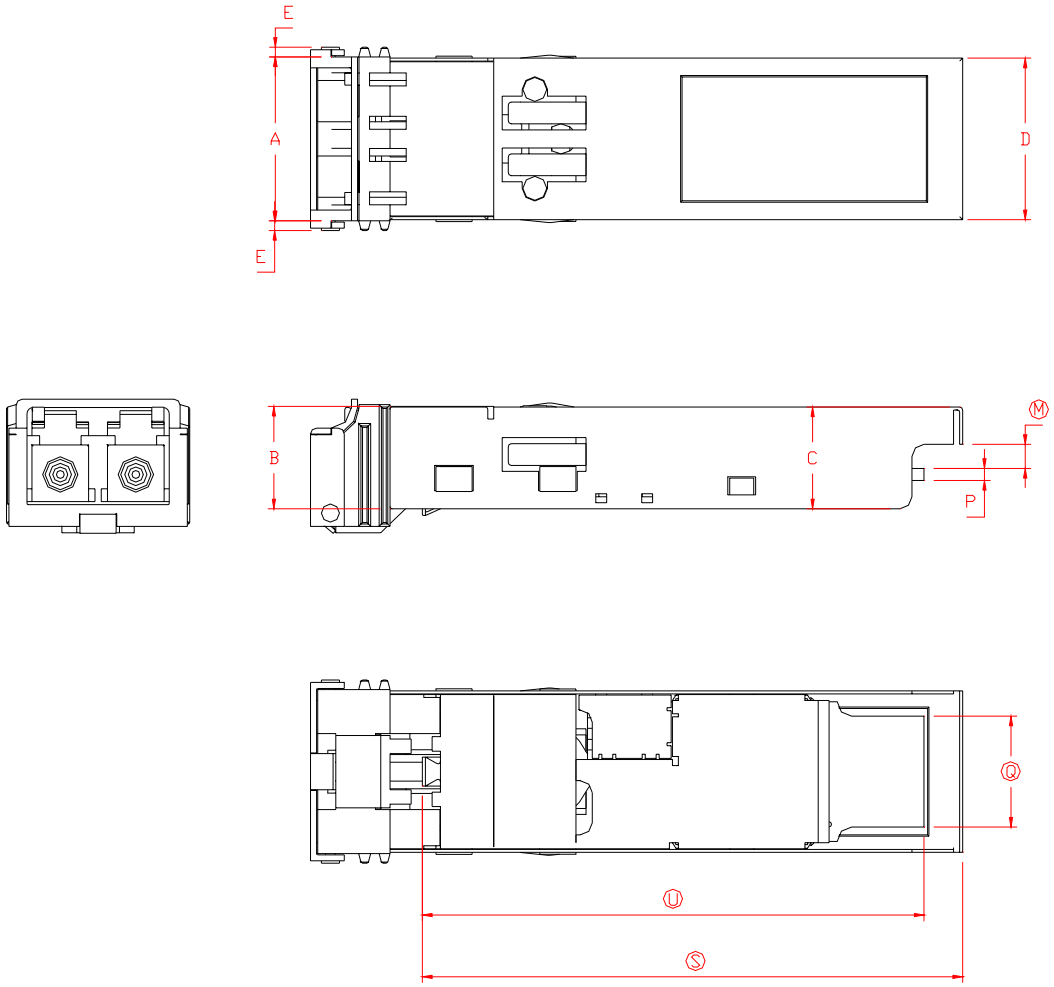


Figure 3: SFP Transceiver Package Dimensions (-MB Version shown)



Refs Des	Key MSA Parameter	Norm. Dim. (mm)	Tolerance	Tool
A	Transceiver Width (Front Section)	13.70	+/-0.10	Caliper
B	Transceiver Height (Front Section)	8.60	+/-0.10	Caliper
C	Transceiver Height (Rear Section)	8.50	+/-0.10	Caliper
D	Transceiver Width (Rear Section)	13.40	+/-0.10	Caliper
E	Extension of Front Sides Outside of Cage	1.00	Max.	RDI
Ⓜ	Gap between PCB & Housing	2.00	+/-0.25	RDI
P	PCB Thickness	1.00	+/-0.10	RDI
Ⓠ	PCB Width	9.20	+/-0.10	Caliper
Ⓢ	Distance between Latch to Rear of Housing	45.00	+/-0.20	RDI
Ⓤ	Distance between Latch to Tip of PCB	41.80	+/-0.15	RDI

NOTE : Only circled alphabets are being measured.

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