



E2O Communications, Inc.

3.3V SFP LC Transceiver for Dual Rate Fibre Channel 850nm VCSEL for Multimode Fiber

EM212-LP3TA-zz Data Sheet



Features

- 850nm Vertical Cavity Surface Emitting Laser (VCSEL) Source Technology
- Interoperable with CD laser based transceivers
- 1.06 and 2.125 Gbps Operating Data Rate
- Compliant with ANSI specifications for Fibre Channel Applications at 2.125 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 EM212-LP3 from E2O Communications is a hot-pluggable 3.3V Small Form-Factor Pluggable transceiver designed for Dual Fibre Channel applications up to 2.125 Gbps. The EM212-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 EM212-LP3 transceiver consists of an optical subassembly housing both the transmitter and the receiver, and an electrical subassembly. All are housed within a plastic/metal package. The transmitter consists of a high-performance 850-nm VCSEL and 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 EM212-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

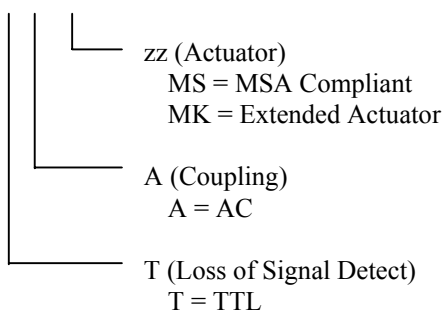
To assist the customer in managing the overall equipment EMI performance, the EM212-LP3 transceiver is designed to be compatible with the industry-standard RFT cage. The RFT cage is designed to provide protection for EMI emission and EMI susceptibility. All transceivers comply with the FCC Class B limits.

Eye Safety

The EM212-LP3 850-nm VCSEL-based transceivers have been designed to meet Class 1 eye safety and comply with FDA 21CFR 1040.10 and 1040.11 and the IEC 825-1.

Ordering Information

EM212-LP3 T A- zz



EB-SFP-A (Evaluation Board)



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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
Storage Temperature	T _S	-40		85	°C	
Supply Voltage	V _{CC}			5.0	V	V _{CC} – 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		2.4	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}	0.37		2.0	V	
Data Output Rise & Fall Times	t _r , t _f			0.15	ns	20-80%
Loss Of Signal Detect Output – High	V _{oh}	2.0		V _{CC}	V	
Loss Of Signal Detect Output - Low	V _{ol}	0.0		0.5	V	



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OPTICAL CHARACTERISTICS ($T_A = 0^\circ\text{C}$ to 70°C , $V_{CC} = 3.15\text{V}$ 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			0.15	ns	20-80% note 1.
Optical Modulation Amplitude (1.06 Gbps Data Rate)	OMA	160			μW	Pk to Pk
Optical Modulation Amplitude (2.125 Gbps Data Rate)	OMA	196			μW	Pk to Pk
Relative Intensity Noise	RIN		-122	-117	dB/Hz	
Transmitter Optical Contributed Jitter (TOTAL)	TJ			150	ps	
RECEIVER						
Minimum Optical Input Power (Sensitivity)	$P_{\text{IN Min}}$			-17	dBm avg.	
Maximum Optical Input Power (Saturation)	$P_{\text{IN Max}}$	-3			dBm avg.	
Operating Center Wavelength	λ_c	770		860	nm	
Optical Modulation Amplitude (1.06 Gbps Data Rate)	OMA	31			μW	Pk to Pk
Optical Modulation Amplitude (2.125 Gbps Data Rate)	OMA	49			μW	Pk to Pk
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	

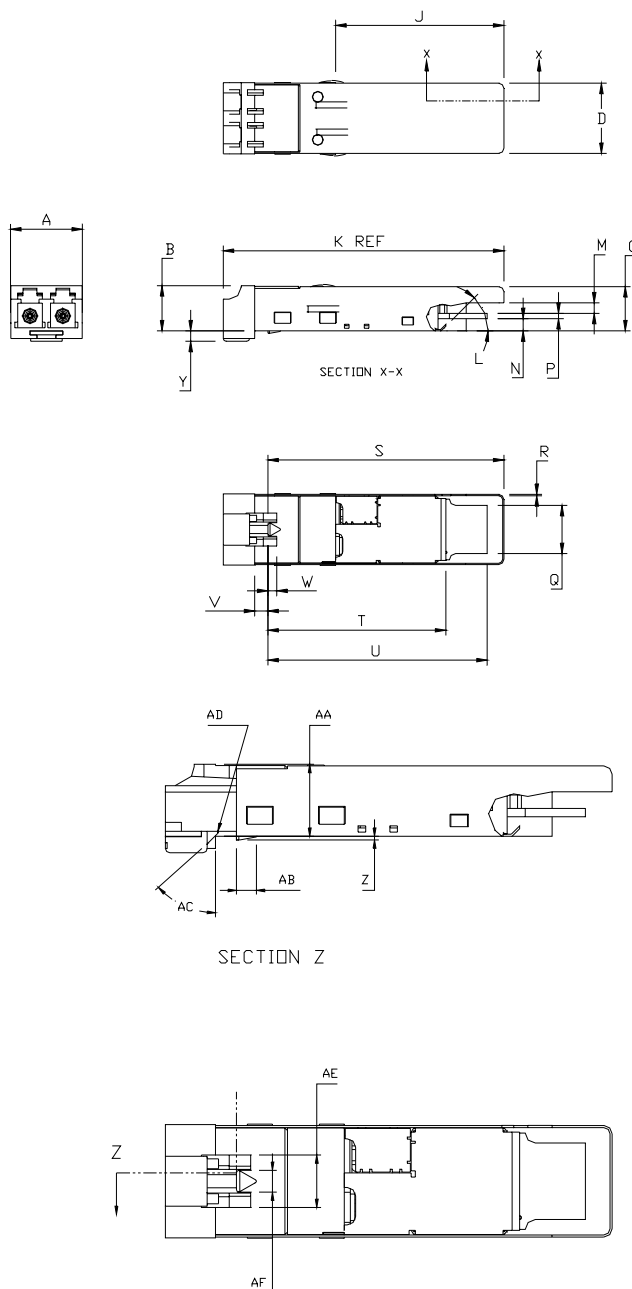
Note 1. measured with the 4th order BT filter off.



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





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Table 2: Dimensions for SFP Transceiver

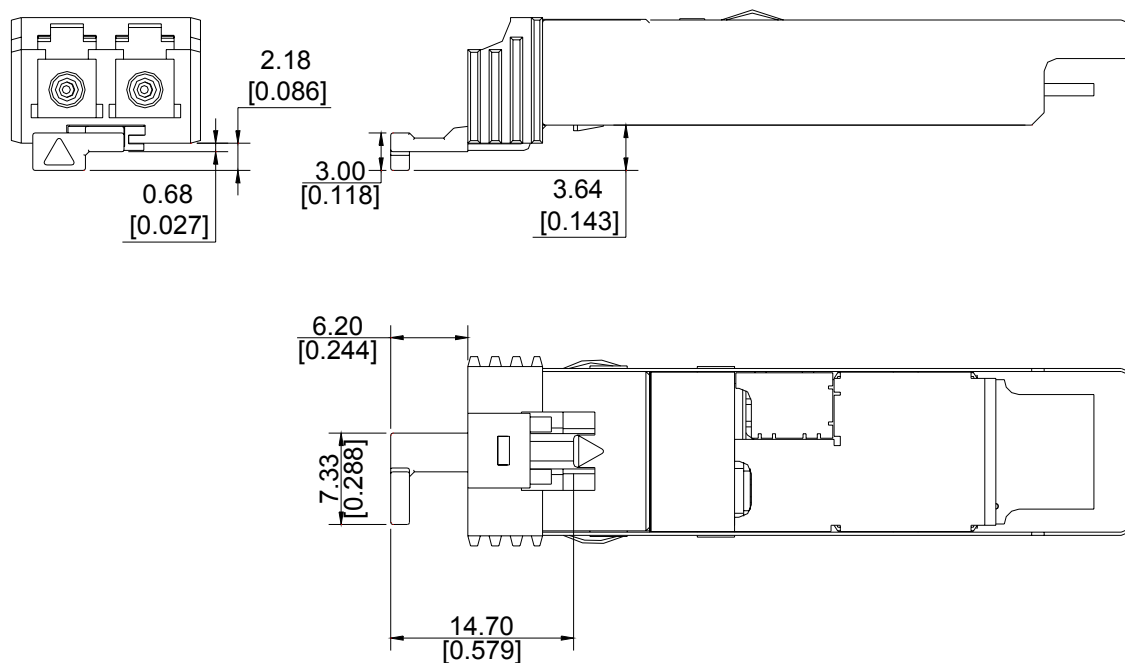
Designator	Dimension (mm)	Tol (mm)	Dimension (inch)	Tol (inch)
A	13.70	± 0.10	0.539	± 0.004
B	8.60	± 0.10	0.339	± 0.004
C	8.45	± 0.10	0.333	± 0.004
D	13.40	± 0.10	0.528	± 0.004
J	32.00	± 0.10	1.260	± 0.004
K	53.50	Reference	2.106	Reference
L	1.20 x 45°	Minimum	0.047 x 45°	Minimum
M	2.00	± 0.25	0.079	± 0.01
N	2.35	+0.00/ -0.10	0.093	+0.000/ -0.004
P	1.00	± 0.10	0.039	± 0.004
Q	9.20	± 0.10	0.362	± 0.004
R	0.25	Maximum	0.010	Maximum
S	45.00	± 0.20	1.772	± 0.008
T	34.30	± 0.30	1.350	± 0.012
U	41.80	± 0.15	1.646	± 0.006
V	2.50	± 0.05	0.098	± 0.002
W	1.70	± 0.10	0.067	± 0.004
Y	1.98	Maximum	0.078	Maximum
Z	0.45	± 0.10	0.018	± 0.004
AA	8.60	± 0.10	0.339	± 0.004
AB	2.30	± 0.10	0.091	± 0.004
AC	45°	± 3°	45°	± 3°
AD	0.10	Reference	0.004	Reference
AE	6.30	Reference	0.248	Reference
AF	2.60	± 0.05	0.102	± 0.002



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



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