



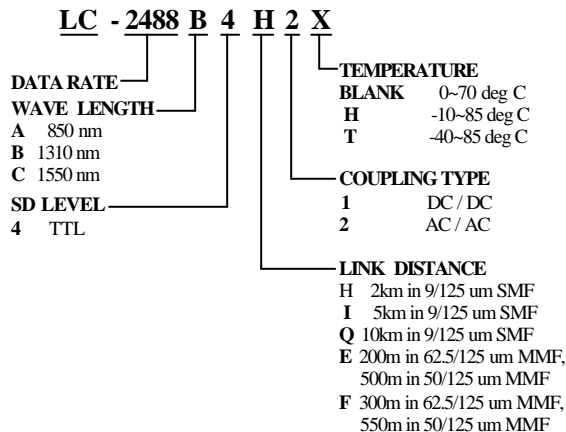
DELTA ELECTRONICS, INC.

LC-2488B4H2 Single Mode Laser Small Form Factor Transceiver for SONET OC-48 / SDH STM-16

FEATURES

- Compliant with SFF Transceiver MSA Specification
- Compliant with Specifications for SONET OC-48/SDH STM-16
- RJ-45 style LC™ connector system
- 1310 nm Fabry-Perot Laser Source Technology
- Data Link up to 2km in 9/125 Signal Mode Fiber
- Single + 3.3V Power Supply and TTL Logic Interface
- 2x5 LC SFF small footprint utilized in high density application
- Laser Class 1 Product which comply with the requirements of IEC 60825-1 and IEC 60825-2

ORDERING INFORMATION



Product Description

The LC-2488B4H2 from DELTA ELECTRONIC is a hot pluggable 3.3V Small Form-Factor transceiver module designed expressly for high-speed bi-directional communication applications that require rates of up to 2.488 Gbit/sec. It is compliant with the SONET OC-48 / SDH STM-16 standards, as well as the SFF Multisource Agreement.

The LC-2488B4H2 transceivers provide with the LC receptacle that is compatible with the industry standard LC connector. The transceiver is supplied in the industry standard 2x5 DIP style and is footprint compatible with SFF Multi Source Agreement(MSA).

The transmitter section of LC-2488B4H2 consists of an 1310 nm Fabry-Perot (FP) Laser in an optical subassembly (OSA) while the receiver consists of a GaAs PIN photo - diode mounted together with a transimpedance preamplifier. The post-amplifier of the LC-2488B4H2 also includes a Signal Detect circuit which provides a TTL logic-high output when an unusable optical signal level is detected.

The LC-2488B4H2 transceiver is a Class 1 eye safety product. The optical power levels, under normal operation, are at eye safe level.



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Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply voltage	V _{CC}	-0.5		5	V	
Storage temperature	T _S	-40		85		
Lead soldering temperature	T _{SOLD}			240		
Lead soldering time	t _{SOLD}			10	sec.	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Ambient Operating Temperature	T _A	0		70		
Supply voltage	V _{CC}	3.15		3.45	V	
Transmitter Differential Input Voltage	V _D	0.4		1.6	V	
Data Output Load	R _{DL}		50			

Electrical Characteristics (T_A=0 degC to 70 degC , V_{CC}=3.15V to 3.45V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
TRANSMITTER						
Supply current	I _{CC}			160	mA	
RECEIVER						
Supply current	I _{CC}			130	mA	
Data output differential voltage	V _D	0.5	0.7	1.2	V	
Output Data risetime	t _r			150	ps	Ref 1
Output Data falltime	t _f			150	ps	Ref 1
Signal Detect Output -High	V _{LH}	2		3.45		
Signal Detect Output -Low	V _{LL}	0		0.8		

Notes:

Ref 1. These are 20% ~80% values

**LC-2488B4H2 Single Mode Laser Small
Form Factor Transceiver for SONET
OC-48 / SDH STM-16**

Optical Characteristics ($T_A=0$ degC to 70 degC , $V_{CC}=3.15V$ to 3.45V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
TRANSMITTER						
Launched power(avg.)	P_O	-10	-6	-3	dBm	Ref 1
Optical extinction ratio		8.2			dB	
Center wavelength	c	1270	1310	1355	nm	
Spectral width(RMS)				4	nm (rms)	
Optical risetime	t_r			100	ps	Ref 2
Optical falltime	t_f			225	ps	Ref 2
RECEIVER						
Optical input sensitivity(avg.)	P_{IN}			-18	dBm	Ref 3
Optical input saturation(avg.)	P_{SAT}	-3			dBm	Ref 4
Optical wavelength			1310		nm	
Signal detect- Assert	P_A			-18	dBm	
Signal detect- Deassert	P_D	-30			dBm	
Signal detect- Hysteresis	$P_A - P_D$	0.5		4	dB	

Notes:

Ref 1. The maximum optical output power complies with class 1 laser eye safety.

Ref 2. These are unfiltered 20-80% values.

Ref 3. The receive sensitivity is measured using a worst case extinction ratio penalty BER better than or equal to 1×10^{-12} in the center of the eye opening with $2^{23}-1$ NRZ PRBS

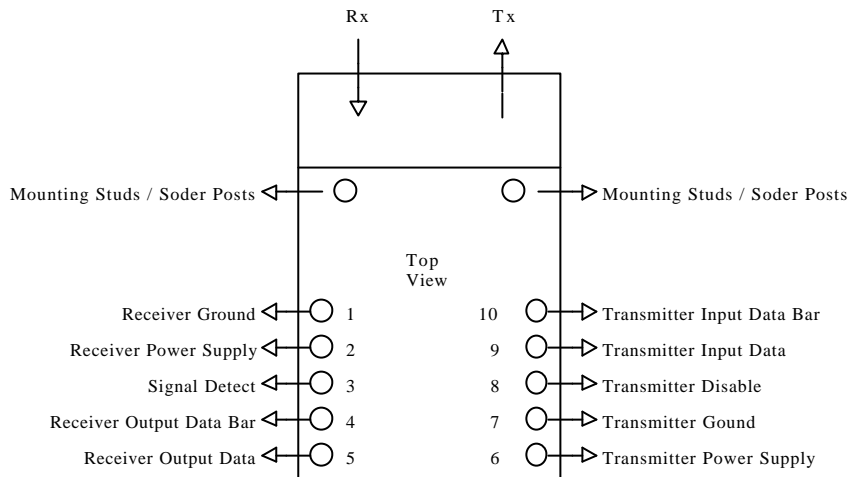
Ref 4. Measured with $2^{23}-1$ NRZ PRBS



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Connection Diagram



Pin Descriptions

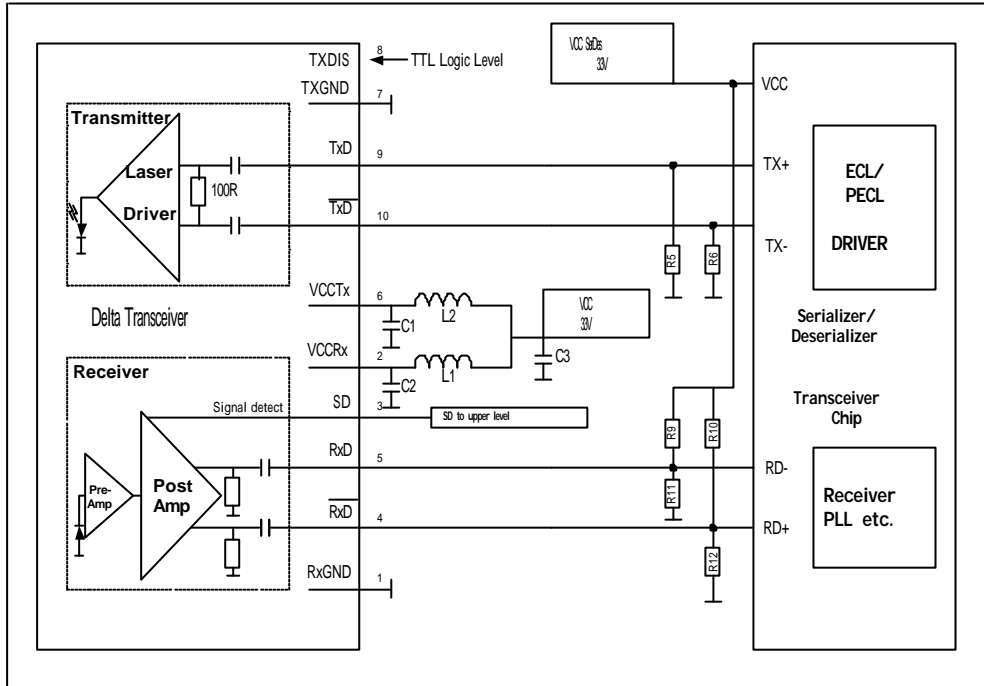
Pin Name	Pin#	Description
Receiver Ground	1	Directly connect this pin to the receiver ground plane
Receiver Power Supply	2	Provide +3.3V dc via the recommended receiver power supply filter circuit.
Signal Detect	3	Receiver Signal Detect TTL output. Active high on this line indicates a received optical signal
Receiver Output Data Bar	4	Receiver data inverted differential AC coupled PECL compatible output
Receiver Output Data	5	Receiver data non-inverted differential AC coupled PECL compatible output
Transmitter Power Spply	6	Provide +3.3V dc via the recommended transmitter power supply filter circuit.
Transmitter Gound	7	Directly connect this pin to the transmitter ground plane
Transmitter Disable	8	Connect this pin to +3.3V TTL logic high '1' to disable module. To enable module, connect this pin to TTL logic low '0'.
Transmitter Input Data	9	Transmitter data inverted differential AC coupled PECL compatible input
Transmitter Input Data Bar	10	Transmitter data non-inverted differential AC coupled PECL compatible input



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Recommended Circuit Schematic :



Input Level (LV-TTL)	TX Function
Low	ON
High	OFF
NIC	ON

Table 1 (Disable Pin Truth Table)

C1/2/3 = 4.7 uF

L1/2 = 1 uH

Value of R5/6/9/10/11/12 may vary as long as proper 50 Ω termination or 100 Ω differential

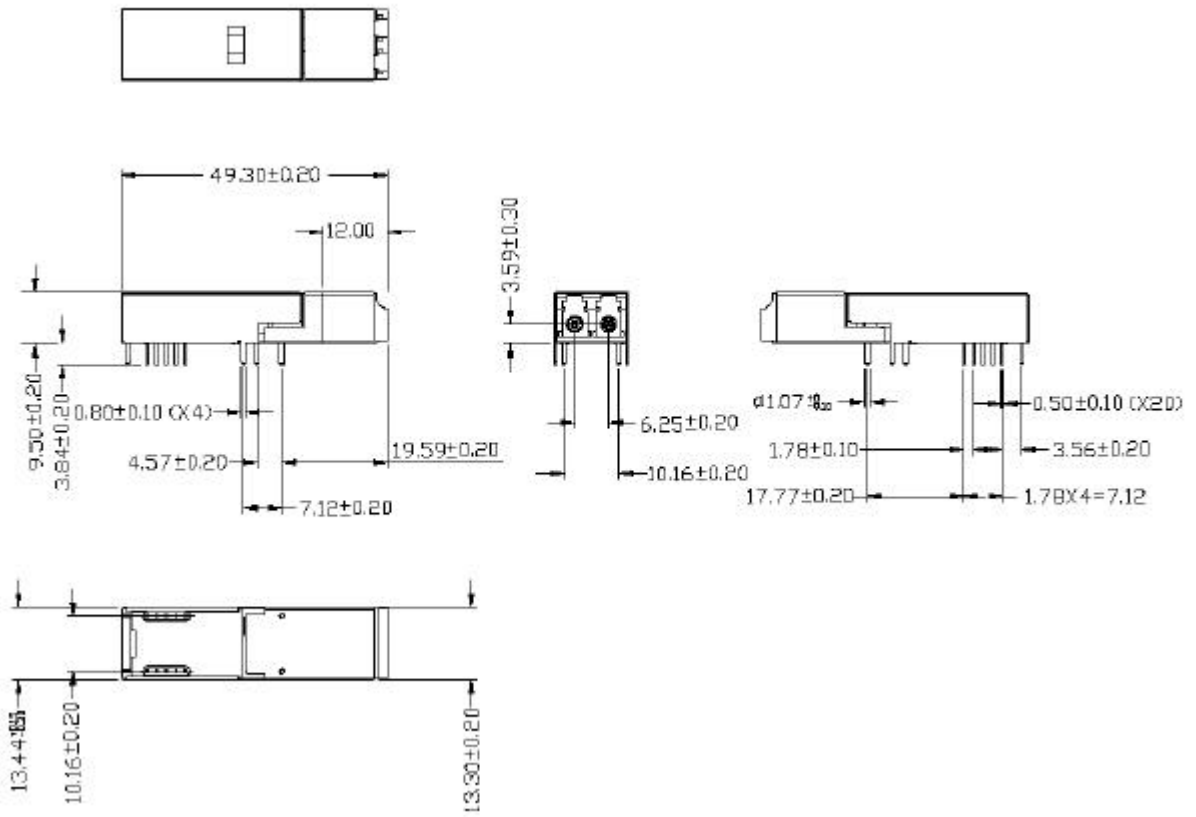
Is Provided. For good EMI performance, the power supply filter is required. Use short tracks from the inductor L1/2 to the module VccTx/VccRx.



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SFF Transceiver Package Dimensions





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Regulatory Compliance

Test Item	Reference	Qty'	Evaluation
#1) Electromagnetic Interference EMI	FCC Class B	5	(1) Satisfied with electrical characteristics of product spec. (2) No physical damage
	EN 55022 Class B		
	CISPR 22		
#2) Immunity : Radio Frequency Electromagnetic Field	EN 61000-4-3	5	
	IEC 1000-4-3		
#3) Immunity : Electrostatic Discharge to the Duplex LC Receptacle	EN 61000-4-2	5	
	IEC 1000-4-2		
	IEC 801.2		
#4) Electrostatic Discharge to the Electrical Pins	MIL-STD-883C Method 3015.4	5	
	EIAJ#1988.3.2B Version 2, Machine model		