

RoHS Compliant 2x5 Small Form Factor Transceiver for Gigabit Ethernet



FEATURES

- Compliant with SFF transceiver MSA specification
- Compliant with specifications for IEEE 802.3z/Gigabit Ethernet
- LC-1250BxQxRx compliant with the 1.0625GBd Fiber Channel 100-SM-LC-L FC-PI Rev.13
- LC-1250AxFxRx compliant with the 1.0625GBd Fiber Channel FC-PI 100-M5-SN-I Rev.13
- Single + 3.3V power supply
- Laser Class 1 product which comply with the requirements of IEC 60825-1 and IEC 60825-2
- Duplex LC connector interface
- TTL or PECL signal detect level
- RoHS Compliant per Directive 2002/95/EC

Description

The LC-1250xxxxRx series are high performance, cost effective optical transceivers intended for 1250 Mb/s. They are designed to provide Gigabit Ethernet compliant link at 1250 Mb/s for short, intermediate and long reach links, respectively.

The LC-1250xxxxRx series provide with the LC receptacle those are compatible with the industry standard LC connector.

The LC-1250xxxxRx series are Class 1 eye safety product. The optical power levels, under normal operation, are at eye safe level.

Applications

- Switch to switch interface
- Switched backplane applications
- File server interface

Performance

LC-1250AxFxRx:

- 850nm VCSEL, up to 500m in 50/125 μ m MMF
- 850nm VCSEL, up to 220m in 62.5/125 μ m MMF

LC-1250BxQxRx:

- 1310nm FP laser, up to 10km in 9/125 μ m SMF
- 1310nm FP laser, up to 550m in 50/125 μ m MMF
- 1310nm FP laser, up to 550m in 62.5/125 μ m MMF

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	°C	
Lead Soldering Temperature	TSOLD			260	°C	
Lead Soldering Time	tsOLD			10	Sec.	
Supply Voltage	Vcc	0		5	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Ambient Operating Temperature	TA	0		70	°C	1
Supply Voltage	Vcc	3.135		3.465	V	

Note: See ordering information for detail

Electrical Characteristics

(V_{CC}=3.135 V to 3.465 V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Transmitter Data Input Voltage-Low	V _{IL-VCC}	-1.81		-1.48	V	
Transmitter Data Input Voltage-High	V _{IH-VCC}	-1.16		-0.88	V	
Transmitter Disable Input-High	V _{DISH}	2		V _{CC} +0.3	V	
Transmitter Disable Input-Low	V _{DISL}	0		0.8	V	
Receiver						
Data Output Voltage-Low	V _{OL-VCC}	-1.95		-1.62	V	
Data Output Voltage-High	V _{OH-VCC}	-1.045		-0.74	V	
SD Output Voltage-Low	V _{SDH-VCC}	-1.95		-1.62	V	ECL Family
SD Output Voltage-High	V _{SDL-VCC}	-1.05		-0.74	V	
SD Output Voltage-Low	V _{SDH-VCC}			0.8	V	LVTTTL
SD Output Voltage-High	V _{SDL-VCC}	2			V	

Transmitter Optical Performance Specifications:

 (V_{CC}=3.135 V to 3.465 V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Current	I _{CC}			150	mA	
Average Launched Power LC-1250AxFxRx LC-1250BxQxRx	P _O	-9.5 -9.5		-4 -3	dBm	
Optical extinction ratio	ER	9			dB	
Center wavelength LC-1250AxFxRx LC-1250BxQxRx	λ _c	830 1274		860 1355	nm	
Spectral Width LC-1250AxFxRx (RMS) LC-1250BxQxRx (RMS)	σ			0.85 2.8	nm	
Relative Intensity Noise	RIN			-116	dB/Hz	
Optical Rise/Fall Time	t _r /t _f			260	ps	1
Output Eye	Complies with the IEEE 802.3z/D2 specification, and is class 1 laser eye safety					

Receiver Optical Performance Specifications:

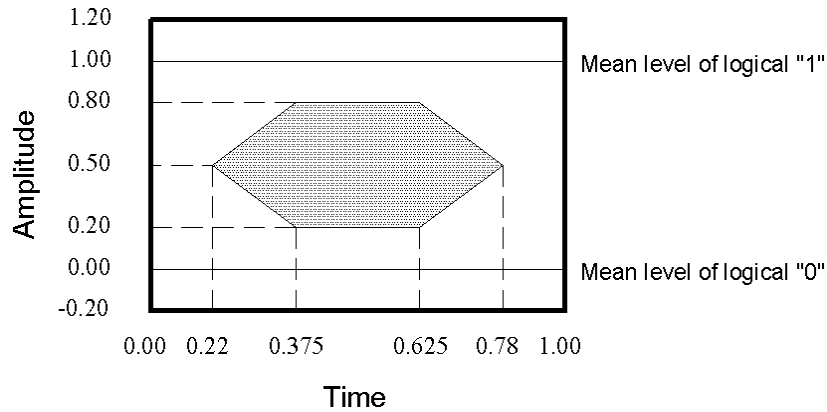
 (V_{CC}=3.135 V to 3.465 V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Current	I _{CC}			120	mA	
Optical input sensitivity (avg.) LC-1250AxFxRx LC-1250BxQxRx	P _{IN}			-17 -19	dBm	2
Optical input saturation (avg.) LC-1250AxFxRx LC-1250BxQxRx	P _{SAT}	-3 -3			dBm	
Optical Wavelength LC-1250AxFxRx LC-1250BxQxRx		830 1274		860 1355	nm	
Output Data risetime	t _r			0.35	ns	1
Output Data falltime	t _f			0.35	ns	1
SD-Asserted Level (Avg.) LC-1250AxFxRx LC-1250BxQxRx	P _A			-17 -19	dBm	
SD-Deasserted Level (Avg.) LC-1250AxFxRx LC-1250BxQxRx	P _D	-30 -30			dBm	
Signal detect- Hysteresis	P _A -P _D	0.5			dB	

Notes:

1. These are unfiltered 20%~80% values.
2. The sensitivity is provided at a BER of 1×10^{-10} or better with an input signal consisting of 1250 Mb/s,

2⁷-1 PRBS and ER=9dB.

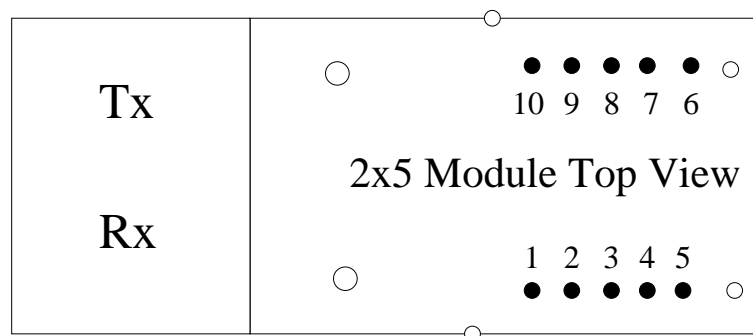


Mask of the eye diagram for the optical transmit signal

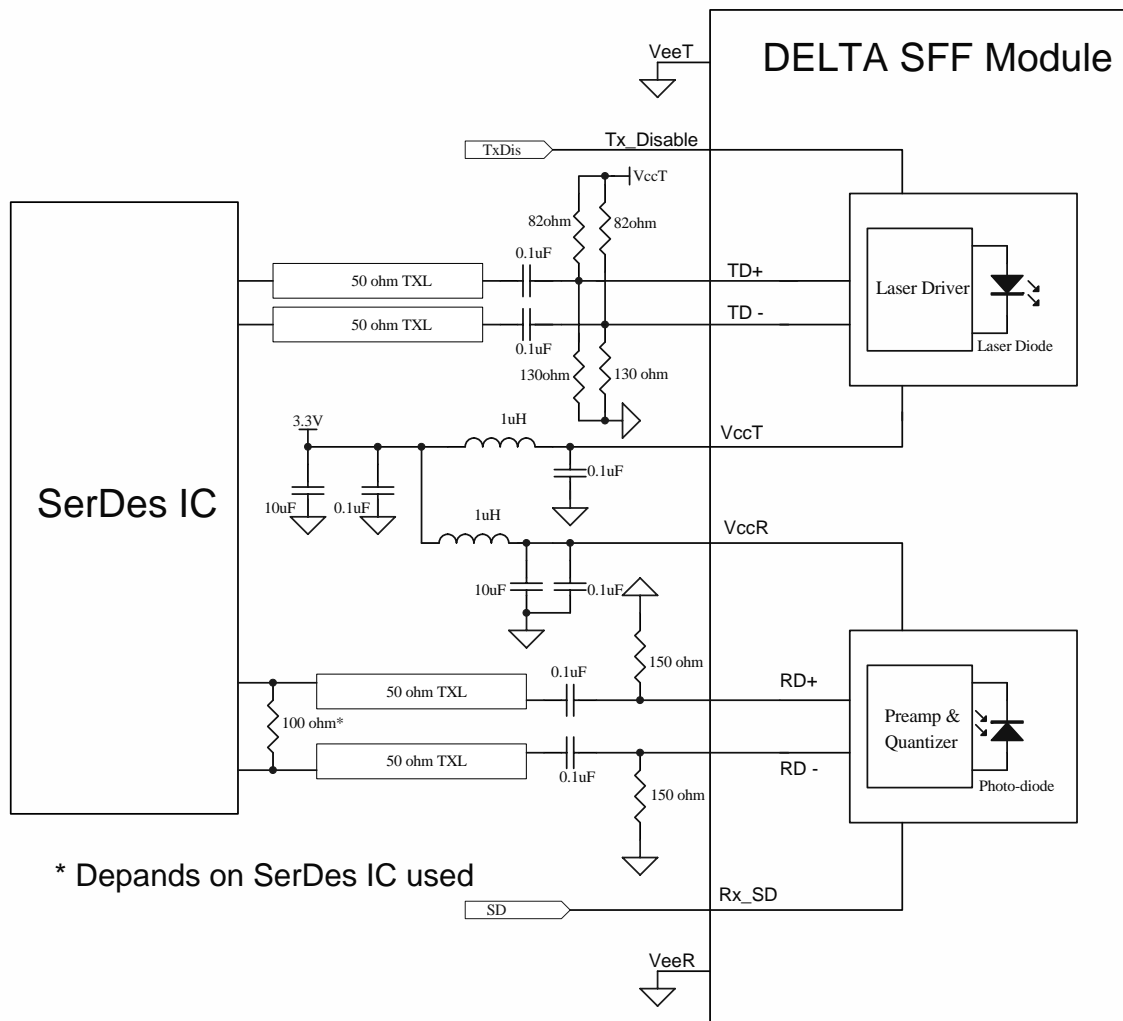
Pin Out Table:

PIN (2X5)	Symbol	Functional description
1	GND	Receiver Signal Ground
2	RXV _{CC}	Receiver Power Supply
3	SD	Signal Detect
4	RD (-)	Receiver Data Out Bar (LVPECL)
5	RD (+)	Receiver Data Out (LVPECL)
6	TXV _{CC}	Transmitter Power Supply
7	GND	Transmitter Signal Ground
8	Disable	Transmitter Disable (LVTTL)
9	TD (+)	Transmitter Data In (LVPECL)
10	TD (-)	Transmitter Data In Bar (LVPECL)

Pin Out Drawing:



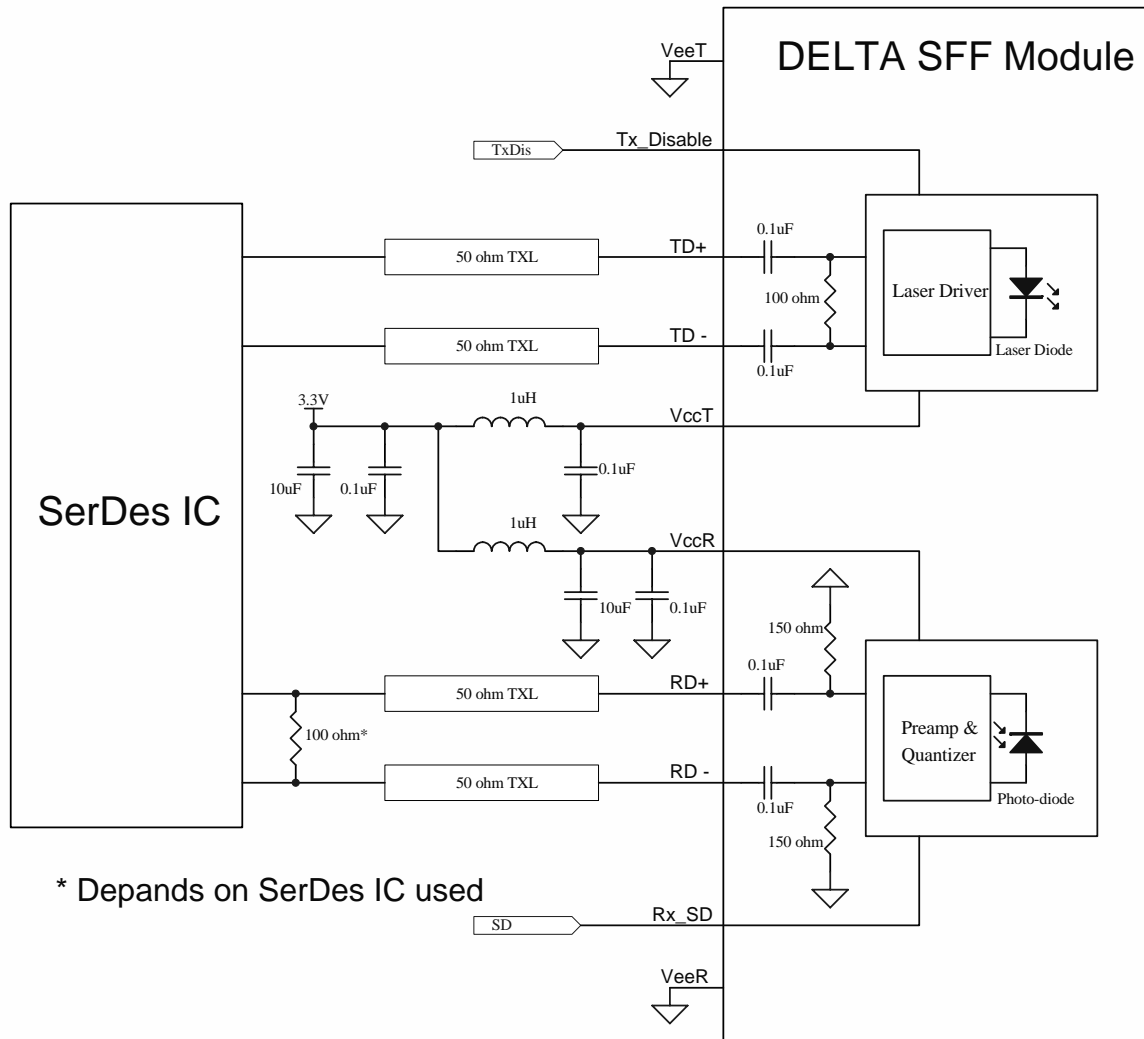
Recommend Circuit Schematic (LC-1250xxx1Rx)



Note:

1. 270 Ohm SD Output pull-down resistors required for LVPECL SD Output.
2. No connected for TTL SD Output.

Recommend Circuit Schematic (LC-1250xxx2Rx)

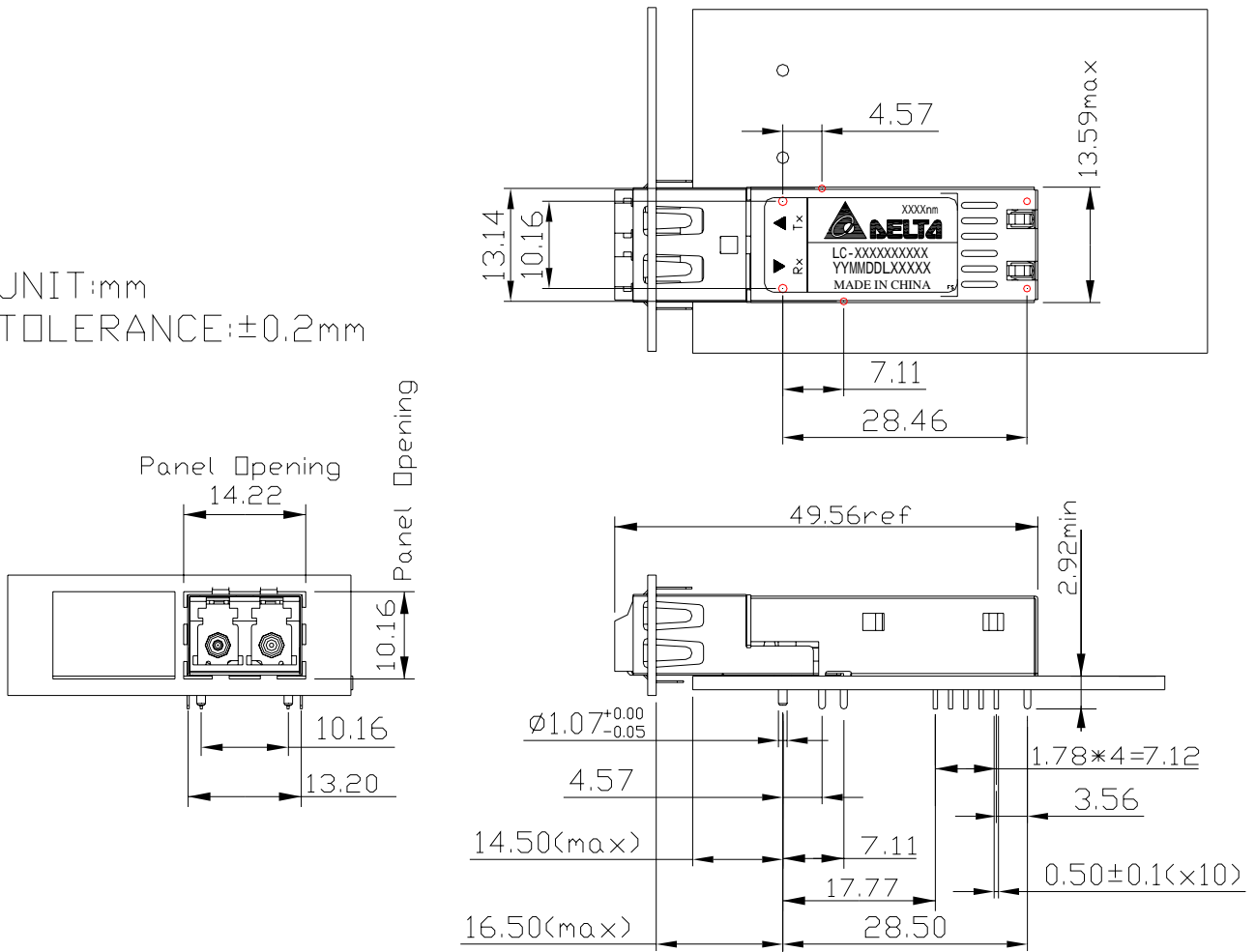


Note:

1. 270 Ohm SD Output pull-down resistors required for LVPECL SD Output.
2. No connected for TTL SD Output.

Package Outline Drawing (Plastic Housing)

UNIT:mm
TOLERANCE:±0.2mm





Regulatory Compliance

Feature	Reference	Performance
Electromagnetic Interference (EMI)	FCC Class B EN 55022 Class B (CISPR 22A)	(1) Satisfied with electrical characteristics of product spec. (2) No physical damage
Radio Frequency Electromagnetic Field	EN 61000-4-3 IEC 1000-4-3	
Electrostatic Discharge to the Duplex LC Receptacle	EN 61000-4-2 IEC 1000-4-2 IEC 801.2	
Electrostatic Discharge to the Electrical Pins	MIL-STD-883E Method 3015.7	
Eye Safety	US FDA CDRH AEL Class 1 EN 60950: 2000 EN 60825-1: 1994+A11+A2 EN 60825-2: 2000	CDRH File # 0321539-00 TUV Certificate No. R50032471
Component Recognition	Underwriters Laboratories and Canadian Standards Association Joint Component Recognition for Information Technology Equipment Including Electrical Business Equipment	UL File # E239394



Ordering information

LC-1250X₁X₂X₃X₄X₅X₆

X₁: Light source types:

- A: 850nm Multi-mode
- B: 1310nm Single-mode

X₂: Power Supply Voltage

- 2: 3.3V / PECL SD Level
- 4: 3.3V / TTL SD Level

X₃: Distance:

- F: 500m, 50/125 μm MMF
- Q: 10km, 9/125 μm SMF

X₄: Pin-out / logic interface:

- 1 = 2X5 / DC-coupled
- 2 = 2X5 / AC-coupled

X₅: Blank: Non-RoHS Compliant

- R: RoHS Compliant

X₆: Temperature

- Blank: 0 to +70 degree C
- H: -10 to +85 degree C
- T: -40 to +85 degree C