

## 2x5 Small Form Factor 1310nm Transceiver for ESCON, Fast Ethernet, ATM, SONET OC-3/SDH STM-1



### FEATURES

- Compliant with SFF Transceiver MSA specification
- Single + 3.3V Power Supply and TTL Logic Interface
- 1310nm Multi Mode Transceiver
- Laser Class 1 Product which comply with the requirements of IEC 60825-1 and IEC 60825-2
- Duplex LC Connector interface
- RoHS Compliant per Directive 2002/95/EC

### Description

The LC-200A4H1RM is high performance, cost effective optical transceiver intended for 200Mbps. It is designed to provide SONET/SDH compliant link at 200Mbps for both short and intermediate reach links.

The LC-200A4H1RM transceivers provide with the LC receptacle that is compatible with the industry standard LC connector.

The post-amplifier of the LC-200A4H1RM also includes a Signal Detect circuit that provides a TTL logic-high output when an unusable optical signal level is detected.

The LC-200A4H1RM transceiver is a 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

- Data Link up to 2km in 62.5/125um Multi Mode Fiber

**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 1: See order information

**Electrical Characteristics**

(V<sub>CC</sub>=3.135V to 3.465V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Total Supply Current	I <sub>CC</sub> T			300	mA	
Transmitter Data input voltage-Low	V <sub>IL</sub> -V <sub>CC</sub>	-1.810		-1.475	V	
Transmitter Data input voltage-High	V <sub>IH</sub> -V <sub>CC</sub>	-1.165		-0.880	V	
Receiver Data output voltage-Low	V <sub>OL</sub> -V <sub>CC</sub>	-1.950		-1.620	V	
Receiver Data output voltage-High	V <sub>OH</sub> -V <sub>CC</sub>	-1.045		-0.740	V	
SD Output Voltage-Low	V <sub>SDH</sub> -V <sub>CC</sub>	0		0.8	V	
SD Output Voltage-High	V <sub>SDL</sub> -V <sub>CC</sub>	2		V <sub>CC</sub> +0.3	V	

**Optical Characteristics**

(V<sub>CC</sub>=3.135V to 3.465V, Data Rate=200Mb/sec, PRBS=2<sup>23</sup>-1 NRZ, 62.5/125um MMF)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Transmitter</b>						
Output Optical Power (Avg.)	P <sub>O</sub>	-20		-14	dBm	
Optical Extinction Ratio		9			dB	
Center Wavelength	λ <sub>C</sub>	1260	1310	1360	nm	
Spectral Width	σ			200	nm	
Duty Cycle Distortion	DCD			0.6	ns	
Data Dependent Jitter	DDJ			1.0	ns	
Optical risetime/falltime	t <sub>r</sub> /t <sub>f</sub>			3	ns	1
Output Eye	Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957					
<b>Receiver</b>						
Sensitivity (Avg.)	P <sub>IN</sub>			-31	dBm	2
Input Optical Wavelength	λ	1100		1600	nm	
Signal Detect-Asserted (Avg.)	P <sub>A</sub>			-31	dBm	
Signal Detect-De-asserted (Avg.)	P <sub>D</sub>	-48			dBm	
Signal Detect-Hysteresis	P <sub>A</sub> -P <sub>D</sub>	0.5			dB	
Overload	P <sub>O</sub>	-14			dBm	

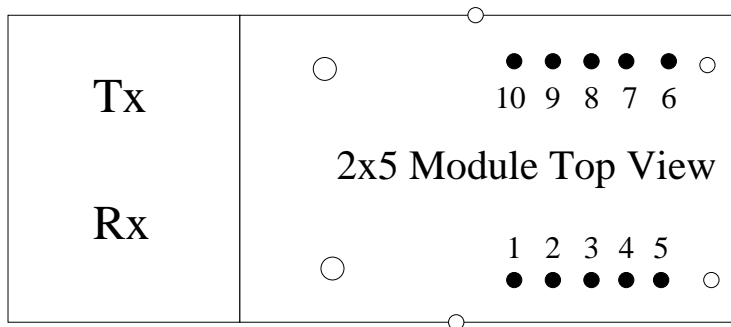
**Notes:**

1. These are 10%~90% values
2. The sensitivity is provided at a BER of 1×10<sup>-10</sup> or better with an input signal consisting of 200Mb/s, 2<sup>23</sup>-1 PRBS.

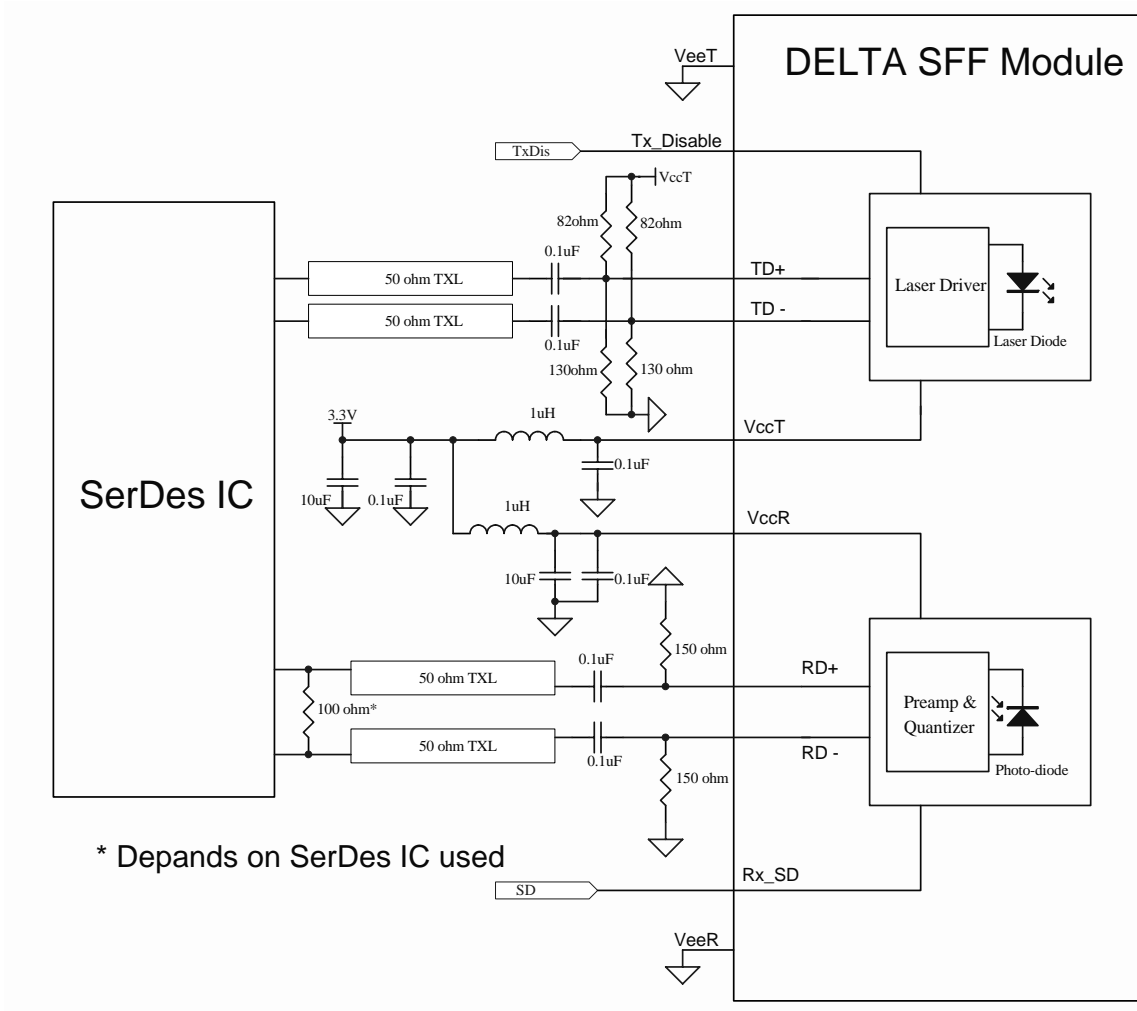
**Pin Definition :**

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

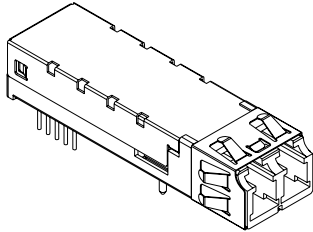
**Pin Drawing**



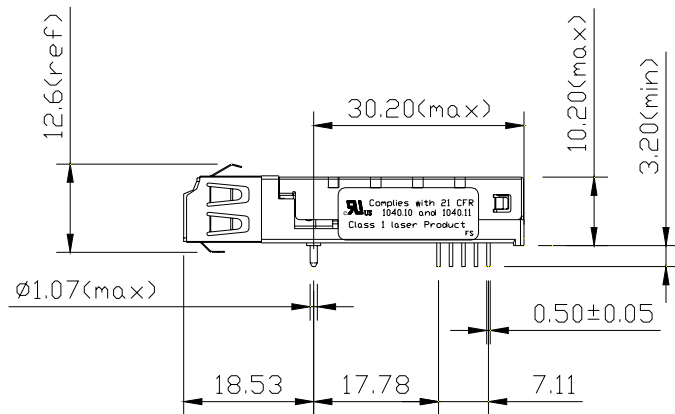
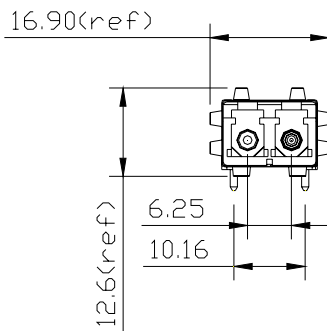
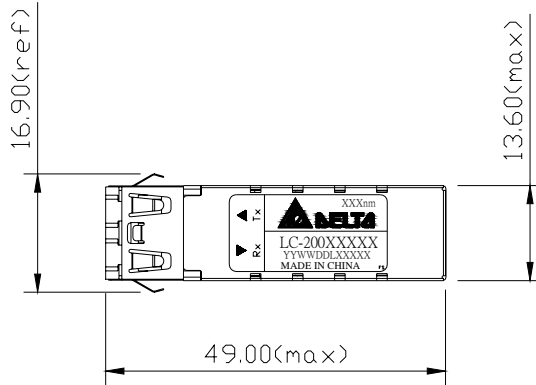
Recommend Circuit Schematic



Package Outline Drawing



Unit:mm  
Tolerance:±0.2



**Regulatory Compliance**

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

## Order information

LC-200Ax<sub>1</sub>x<sub>2</sub>x<sub>3</sub>x<sub>4</sub>x<sub>5</sub>x<sub>6</sub>

**x<sub>1</sub> : Power Supply Voltage and SD Level**

4 : 3.3V ; Data In/Out (PECL) ; SD Output (TTL)

**x<sub>2</sub> : Distance**

H : 2Km

**x<sub>3</sub> : Package type & coupling type**

1 : 2X5LC DC/DC

**x<sub>4</sub> : RoHS**

Blank : Non-RoHS Compliant

R : RoHS Compliant

**x<sub>5</sub> : Housing Type**

M : Metal Housing

**x<sub>6</sub> : Temperature**

Blank : 0 to 70°C

H : -10 to 85°C

T : -40 to 85°C