

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module for ATM, SONET OC-3/SDH STM-1

LC-155B4J7

Preliminary

Features

- LC Duplex Singlemode Transceiver
- Industry Standard 2 x 10 Footprint
- Intermediate SONET OC-3 / SDH STM-1 (I-1/S-1.1) Compliant
- Single +3.3 V Power Supply
- PECL Differential Inputs and Outputs
- TTL Signal Detect Output
- Wave Solderable and Aqueous Washable
- Class 1 Laser International Safety Standard IEC 825 Compliant

Applications

- ATM 155.52Mb/s Links
- SONET OC-3/SDH STM-1 Interconnections

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Reference
Storage Temperature	T _s	-40		85	°C	
Lead Soldering Temperature	T _{SOLD}			260	°C	
Lead Soldering Time	t _{SOLD}			10	sec.	
Supply Voltage	V _{CC}	0		5	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Reference
Ambient Operating Temperature	T _A	0		70	°C	
Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Transmitter Data Input Voltage-Low	V _{IL} -V _{CC}	-1.95		-1.45	V	
Transmitter Data Input Voltage-High	V _{IH} -V _{CC}	-1.17		-0.73	V	
Transmitter Differential Input Voltage	V _D	0.3		1.6	V	
Data Output Load	R _{DL}		50		ohm	



TITLE				DATE:	
LC-155B4J7				31.Jan.2002	
WRITTEN	CHECKED	APPROVED	DOCUMENT NO:		REV:
James Cheng	Teddy Kuo	YY.Tsai			S0

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module for ATM, SONET OC-3/SDH STM-1

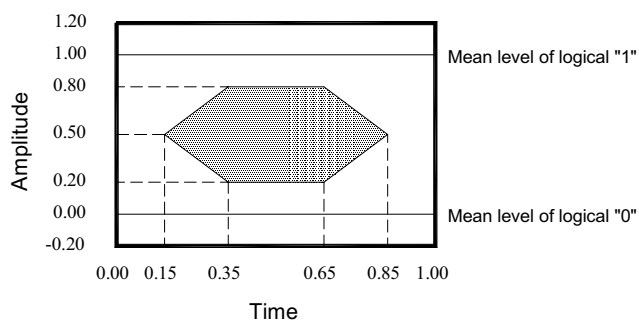
LC-155B4J7

Preliminary

Transmitter Electrical Characteristics

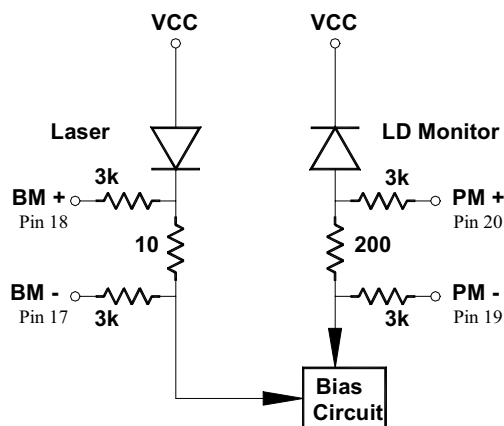
Parameter	Symbol	Min.	Typ.	Max.	Unit	Reference
Power Supply Voltage	V	3.135	3.3	3.465		
Supply Current	I _{CC}			140	mA	
Output Optical Power	P _O	-15		-8	dBm avg.	
Optical Extinction Ratio		10			dB	
Center Wavelength	λ_c	1261	1310	1360	nm	
Optical Rise/Fall Times	tr/tf			1.5	ns	Note 1
Spectral Width (RMS)	σ			5	nm	
Disable Input Voltage-High	V _{DISH}	2.0			V	
Disable Input Voltage-Low	V _{DISL}			0.8	V	
Disable Output Optical Power	P _{OD}			-40	dBm	
LD Bias Monitor Voltage	V _{BM}	0.01		0.5	V	Note 2
Rear Facet Monitor Voltage	V _{PM}	0.01		0.2	V	Note 2

1. These are 20-80% values.
2. At ambient temp. of 25 degrees C.



Optical Pulse Mask with Bessel Filter Specified in ITU-T G.957

Mask of the eye diagram for the optical transmit signal



Monitor Circuit Schematic Diagram

 DELTA ELECTRONICS, INC.	TITLE				DATE:	
	LC-155B4J7				31.Jan.2002	
	WRITTEN	CHECKED	APPROVED	DOCUMENT NO:		REV:
	James Cheng	Teddy Kuo	YY.Tsai			S0

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module for ATM, SONET OC-3/SDH STM-1

LC-155B4J7

Preliminary

Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Reference
Power Supply Voltage	V	3.135	3.3	3.465		
Supply Current	I _{CCR}			140	mA	
Data Output Voltage-Low	V _{OL} -V _{CC}	-1.86		-1.62	V	
Data Output Voltage-High	V _{OH} -V _{CC}	-1.10		-0.86	V	
Sensitivity	P _{IN}			-31	dBm avg.	Note 1
Input Optical Wavelength	λ	1100	1310	1600	nm	
SD Output Voltage-High	V _{SDH}	2.2		V _{CC}	V	
SD Output Voltage-Low	V _{SDL}	0		0.5	V	
Signal Detect-Asserted	P _A			-32	dBm avg.	
Signal Detect-De-asserted	P _D	-48			dBm avg.	
Signal Detect-Hysteresis	P _A -P _D	1.0			dB	
Overload	P _O	-8			dBm	

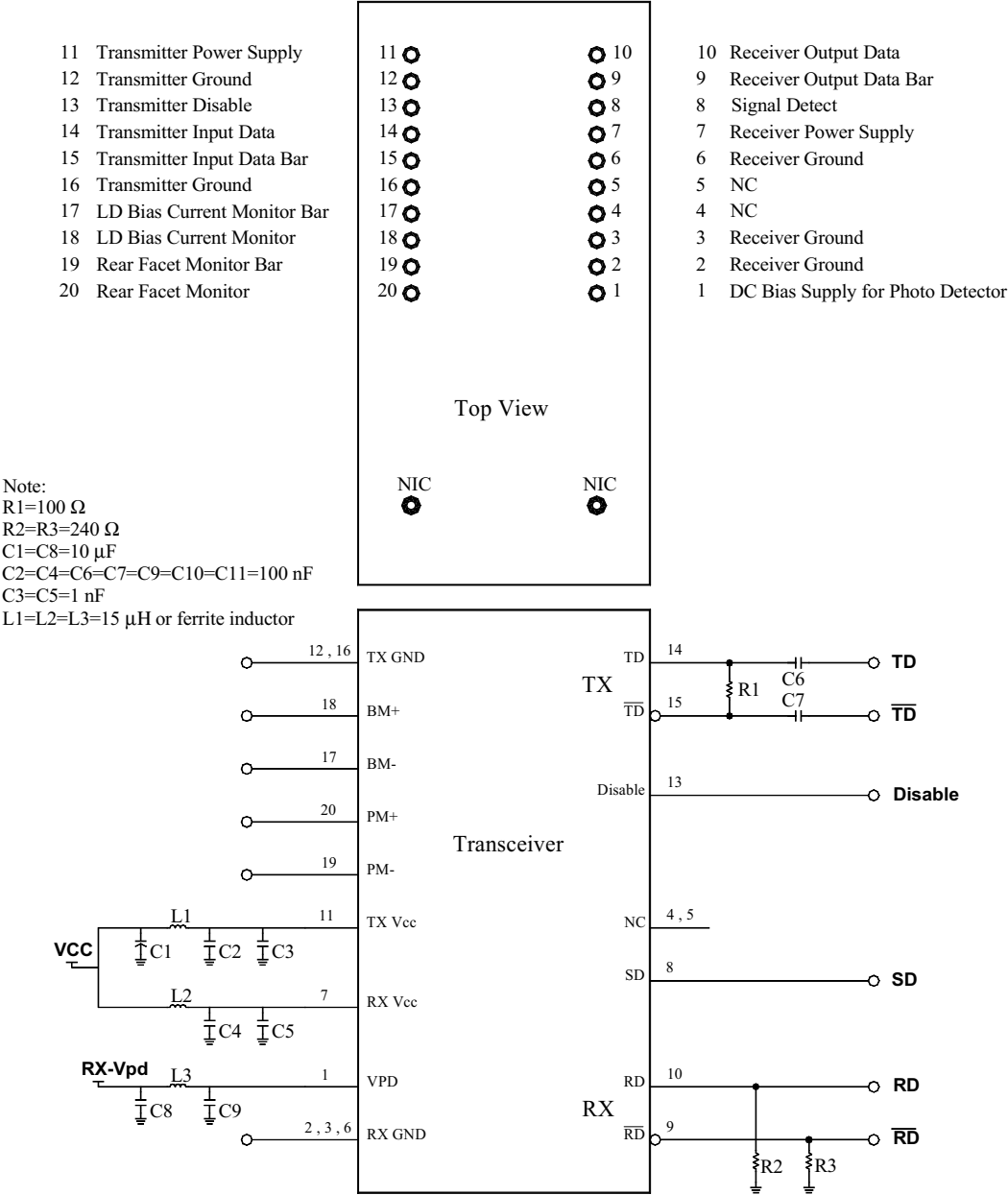
Note 1. The sensitivity is provided at a BER of 1×10^{-10} or better with an input signal consisting of 155.52 Mb/s, 2²³-1 PRBS.

 DELTA ELECTRONICS, INC.	TITLE				DATE:	
	LC-155B4J7				31.Jan.2002	
	WRITTEN	CHECKED	APPROVED	DOCUMENT NO:		REV:
	James Cheng	Teddy Kuo	YY.Tsai			S0

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module
for ATM, SONET OC-3/SDH STM-1

LC-155B4J7

Preliminary



Recommended Circuit Schematic

 DELTA ELECTRONICS, INC.	TITLE LC-155B4J7				DATE: 31.Jan.2002	
	WRITTEN	CHECKED	APPROVED	DOCUMENT NO:		REV: S0
	James Cheng	Teddy Kuo	YY.Tsai			

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module for ATM, SONET OC-3/SDH STM-1

LC-155B4J7

Preliminary

Table 1: Pin Out Table

PIN		Functional description
1	VPD	DC Bias Supply for Photo Detector.
2	GND	Receiver Power Ground
3	GND	Receiver Power Ground
4	NC	Pin Not Connected
5	NC	Pin Not Connected
6	GND	Receiver Power Ground
7	VccR	Receiver Power Supply
8	SD	Signal Detect (LVTTTL)
9	RD (-)	Receiver Data Output - (LVPECL)
10	RD (+)	Receiver Data Output + (LVPECL)

 DELTA ELECTRONICS, INC.	TITLE			DATE:	
	LC-155B4J7			31.Jan.2002	
	WRITTEN	CHECKED	APPROVED	DOCUMENT NO:	REV:
	James Cheng	Teddy Kuo	YY.Tsai		S0

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module for ATM, SONET OC-3/SDH STM-1

LC-155B4J7

Preliminary

Table 2: Pin Out Table

PIN		Functional description
11	VccT	Transmitter Power Supply
12	GND	Transmitter Signal Ground
13	Disable	Transmitter Disable (LVTTTL)
14	TD (+)	Transmitter Data In + (LVPECL)
15	TD (-)	Transmitter Data In – (LVPECL)
16	GND	Transmitter Signal Ground
17	BM (-)	Laser Bias Monitor $I_{BIAS} = (BM_{(+)} - BM_{(-)}) / 10 \Omega$
18	BM (+)	
19	PM (-)	Rear Facet Monitor $I_{PM} = (PM_{(+)} - PM_{(-)}) / 1 k\Omega$
20	PM (+)	

Note :

The BM and FM currents are calculated as ratios of the corresponding Voltages to their current-sensing resistors, 10 Ω and 1k Ω (refer to Monitor Circuit Schematics Diagram).

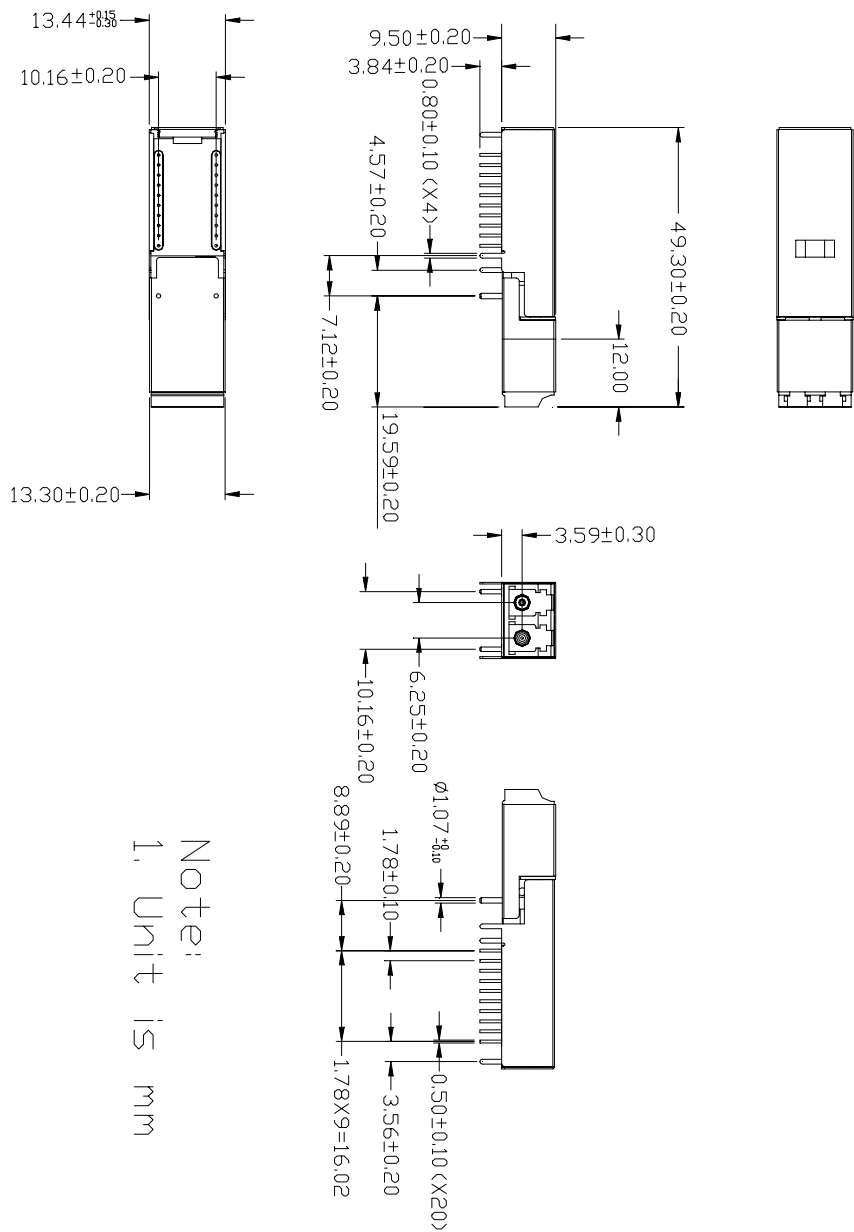
 DELTA ELECTRONICS, INC.	TITLE			DATE:	
	LC-155B4J7			31.Jan.2002	
	WRITTEN	CHECKED	APPROVED	DOCUMENT NO:	REV:
	James Cheng	Teddy Kuo	YY.Tsai		S0

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module
for ATM, SONET OC-3/SDH STM-1

LC-155B4J7

Preliminary

Mechanical Dimensions



Note:
1. Unit is mm

 DELTA ELECTRONICS, INC.	TITLE			DATE:	
	LC-155B4J7			31.Jan.2002	
	WRITTEN	CHECKED	APPROVED	DOCUMENT NO:	REV:
	James Cheng	Teddy Kuo	YY.Tsai		S0

2X10 LC Duplex 155Mbps Single-mode Optical Transceiver Module for ATM, SONET OC-3/SDH STM-1

LC-155B4J7

Preliminary

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	

 DELTA ELECTRONICS, INC.	TITLE			DATE:	
	LC-155B4J7			31.Jan.2002	
	WRITTEN	CHECKED	APPROVED	DOCUMENT NO:	REV:
	James Cheng	Teddy Kuo	YY.Tsai		S0