

2X5 LC Duplex 155Mbps Multi-mode Optical Transceiver Module for Fast Ethernet, ATM, SONET OC-3/SDH STM-1

LC-155A2H1

Features

- LC Duplex Multimode Transceiver
- Industry Standard 2 x 5 Footprint
- Intermediate SONET OC-3 / SDH STM-1 Compliant
- Single +3.3 V Power Supply
- PECL Differential Inputs and Outputs
- PECL Signal Detect Output
- Wave Solderable and Aqueous Washable
- Class 1 LED International Safety Standard IEC 825 Compliant

Applications

- ATM 155Mb/s Links
- SONET OC-3/SDH STM-1 Interconnections
- Fast Ethernet

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-VCC}	-1.95		-1.45	V	
Transmitter Data Input Voltage-High	V _{IH-VCC}	-1.17		-0.73	V	
Transmitter Differential Input Voltage	V _D	0.3		1.6	V	
Data Output Load	R _{DL}		50		ohm	

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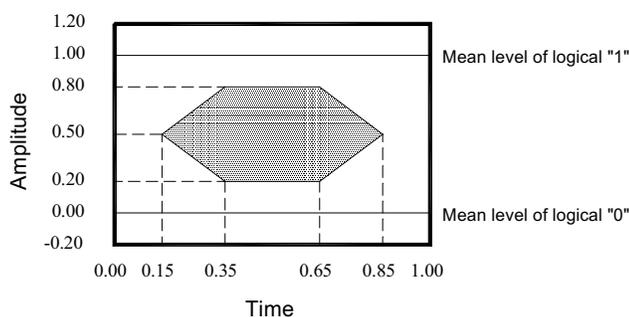
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Transmitter Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Reference
Power Supply Voltage	V	3.135	3.3	3.465		
Supply Current	I _{CCT}			200	mA	
Output Optical Power	P _o	-20		-14	dBm avg.	
Optical Extinction Ratio		9			dB	
Center Wavelength	λ_c		1310		nm	
Optical Rise/Fall Times	tr/tf			3.0	ns	Note 1
Spectral Width (RMS)	$\Delta \lambda$			200	nm	
Duty Cycle Distortion	DCD			0.6	ns	
Data Dependent Jitter	DDJ			1.0	ns	
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	
Optical Disable Assert Time	T _{DASSERT}			5	μ sec	
Optical Disable Deassert Time	T _{DDEASSERT}			10	msec	

Note 1. These are 10-90% values.



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

Mask of the eye diagram for the optical transmit signal

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Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Reference
Power Supply Voltage	V	3.135	3.3	3.465		
Supply Current	I _{CCR}			120	mA	
Data Output Voltage-High	V _{OH} -V _{CC}	-1.16		-0.88	V	
Data Output Voltage-Low	V _{OL} -V _{CC}	-1.85		-1.47	V	
Sensitivity	P _{IN}			-31	dBm avg.	Note 1
Input Optical Wavelength	λ	1100	1310	1600	nm	
SD Output Voltage-High	V _{SDH} -V _{CC}	-1.16		-0.88	V	
SD Output Voltage-Low	V _{SDL} -V _{CC}	-1.85		-1.47	V	
SD Assert Time	t _a	2.3		100	μsec.	
SD Deassert Time	t _d	2.3		100	μsec.	
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	-14			dBm	Note 2

Note1. The sensitivity is provided at a BER of 1×10^{-10} or better with an input signal consisting of 155.52 Mb/s, $2^{23}-1$ PRBS.

Note2. Guarantee PIN/TIA will be not saturation when optical input power lower than -14 dBm.

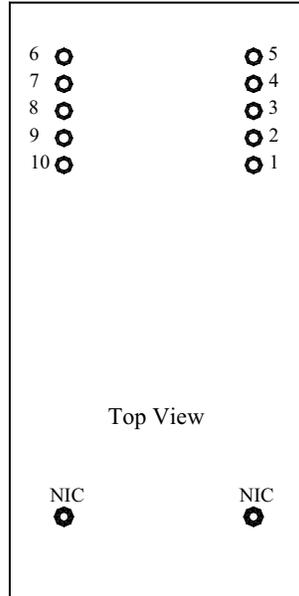
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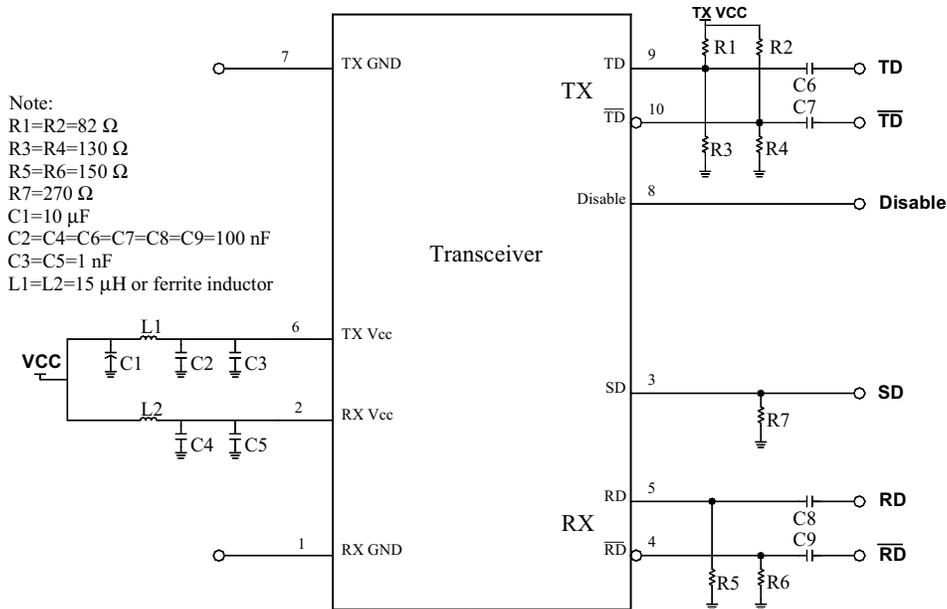
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Recommended Circuit Schematic :

- 6 Transmitter Power Supply
- 7 Transmitter Ground
- 8 Transmitter Disable
- 9 Transmitter Input Data
- 10 Transmitter Input Data Bar



- 5 Receiver Output Data
- 4 Receiver Output Data Bar
- 3 Signal Detect
- 2 Receiver Power Supply
- 1 Receiver Ground



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LC-155A2H1 Table: Pin Out Table

PIN	FUNCTION	LOGIC FAMILY
1	GND	Receiver Power Ground
2	VccRx	Receiver Power Supply
3	SD	Signal Detect (LVPECL)
4	RD (-)	Receiver Data Output - (LVPECL)
5	RD (+)	Receiver Data Output + (LVPECL)
6	VccTx	Transmitter Power Supply
7	GND	Transmitter Signal Ground
8	Disable	Transmitter Disable (LVTTTL) Note 1
9	TD (+)	Transmitter Data In + (LVPECL)
10	TD (-)	Transmitter Data In - (LVPECL)

Note 1. Disable Pin truth table

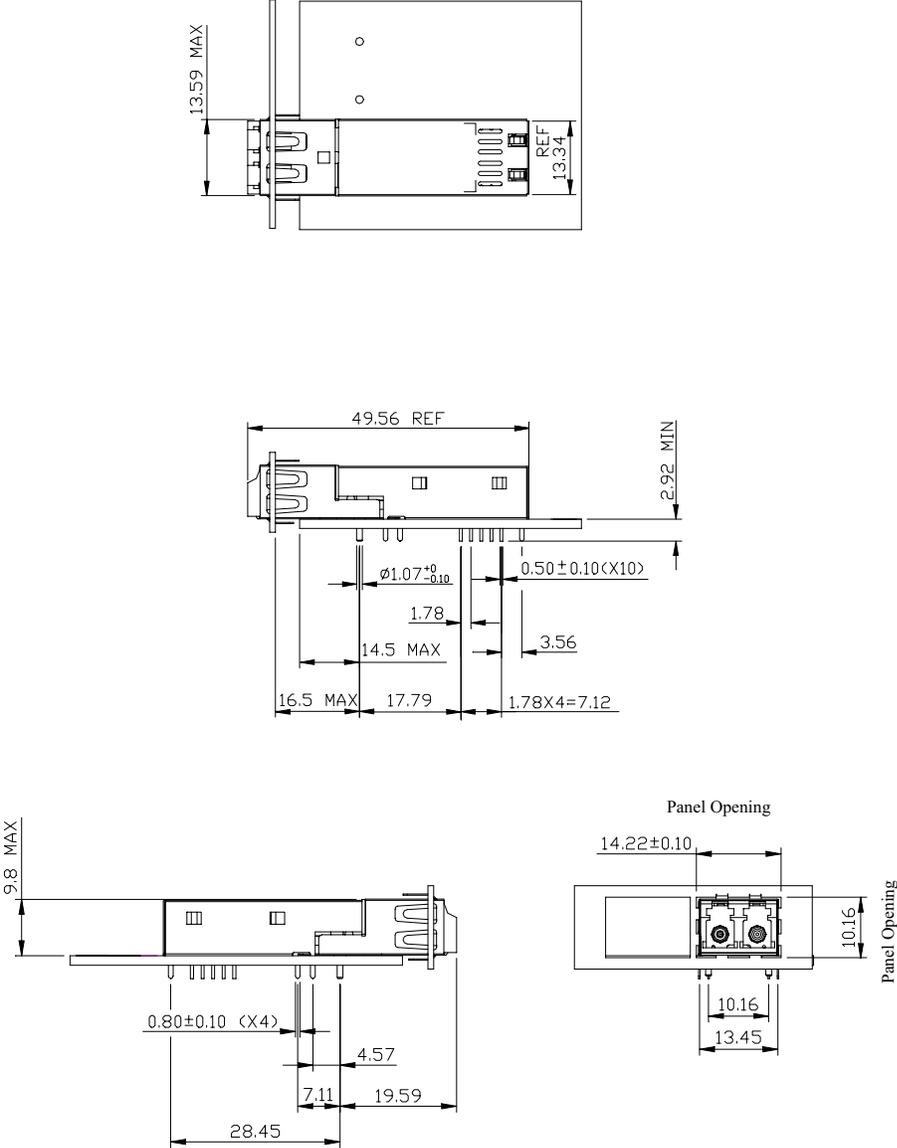
Input Level (LV-TTL)	TX Function
Low	ON
High	OFF
NIC	ON

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Mechanical Dimensions Unit:mm



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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	

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