



R14G-Lx12x SERIES QUAD PORT RJ FORMAT OPTICAL FIBER TRANSCEIVERS

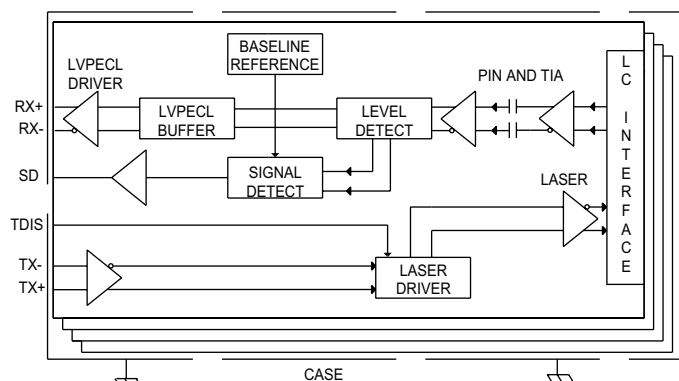
Sonet / SDH Compliant

3.3Volts, 1310nm FP Lasers, Single Mode
Intermediate Reach, Fast Ethernet, OC-3 and
STM-1 applications

FEATURES

- Compliant with ITU-T Recommendations G.957 / 8
- Duplex single mode LC receptacle at each port
- Compliant with Bellcore / Telcordia GR - 253
- Wave solder and aqueous wash compatible
- LVPECL or LVTTTL signal detect options
- Front panel chassis grounding springs
- Single +3.3 V power supply per port
- IEC 825 / CDRH Class 1 compliant
- Compliant with ANSI T1.15.06-1996
- Compliant with IEEE 802.3u

BLOCK DIAGRAM



APPLICATIONS

The R14G-Lx12xx single mode glass optical fiber transceivers provide low profile, cost effective solutions for Fast Ethernet, OC-3 or STM-1 applications (up to 15.0 Km) optical fiber data links.

These transceivers are fully compliant with the ITU-T, IEEE, Bellcore / Telcordia and ANSI standards but they can be used for any other data communications purpose within their operating parameters

DESCRIPTION

The R14G-Lx12xx fiber optic transceivers consist of transmitter and receiver functions combined in a four port RJ Format "harmonica" module. The optical transmitters are high output 1310nm Fabry-Perot lasers. The transmitter input lines are driven with differential LVPECL signals applied to the Transmit (TX+ and TX-) pins. These signals are internally converted to a suitable modulation current by a CMOS integrated circuit.

The optical receivers consist of PIN and Preamplifier assemblies and CMOS limiting post-amplifier integrated circuits. Outputs from the receivers consist of differential LVPECL data signals on the Receive (RX+ and RX-) pins and single ended LVPECL or LVTTTL signal detect functions on the Signal Detect (SD) pins.

ORDERING INFORMATION

R	1	4	G	-	L	X	1	2	X	X
Form Factor	# of Rows	# of Ports	Protocol Application		Transmitter Wavelength	Signal Detect	Power Supply	Fiber Type / Reach	PCB Tail Length	Operating Temperature
R= RJ Format	1= Single Row	4= Four Port	G= Fast Ethernet / OC-3 / STM-1		L= 1310nm	P= LVPECL	1= 3.3V	2= Single Mode	'blank' = 0.125" / 3.2mm	'blank' = 0° to +70°C
						T= LVTTTL			L = 0.18" / 4.6mm	H = -40° to +85°C
R	1	4	G	-	L	-	1	2	-	-



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ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	T_s	-55		+100	°C
Lead Soldering Temperature	T_{SOLD}			+260	°C
Lead Soldering Time	t_{SOLD}			10	Seconds
Supply Voltage	V_{CC}	-0.5		+4.5	V
Data Input Voltage	V_I	-0.5		V_{CC}	V
Differential Input Voltage (p-p)	V_D			2.0	V
Output Current	I_O			50	mA

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature Limit					
Part Number xxxx-xxxx (Commercial Temp)	T_A	0		+70	°C
Part Number xxxx-xxxxH (Industrial Temp)		-40		+85	
Supply Voltage	V_{CC}	+3.135		+3.465	V
TX Common Mode Voltage	V_{CM}		2.00		V
TX Differential Input Voltage (p-p)	V_D	0.35		1.25	V
RX Data Output Load	R_L		50		Ohms

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TRANSMITTERS

VCCTX = 3.0V to 3.6V, T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power ¹	P_o	-15		-8	dBm
Optical Output Wavelength	λ_{OUT}	1263	1310	1360	nm
Spectral Width	$\Delta\lambda_{RMS}$			3	nm
Extinction Ratio	ER	10			dB
Supply Current	I_{CC}		120	160	mA
Optical Rise Time	t_R			2.0	ns
Optical Fall Time	t_R			2.0	ns

1. BER=10⁻¹⁰ @ 155.52Mbps, PRBS 2²³-1, NRZ, Compliant with Telcordia GR-253 and ITU recommendations G.957 and G.958

RECEIVERS

VCCTX = 3.0V to 3.6V, T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity ¹	P_i	-28		-8	dBm
Optical Wavelength	λ_{IN}	1261		1380	nm
Supply Current	I_{CC}		70	120	mA
Signal Detect Assert Time	t_{SDAS}		<10	100	μ S
Signal Detect Deassert Time	t_{SDDA}		<10	350	μ S
Signal Detect Threshold Decreasing Light	LSTD	-45.0		-32.5	dBm
Increasing Light	LSTI	-45.0		-32.0	dBm
Signal Detect Hysteresis	HYS	0.5	2.25	3.5	dB
RX Data Output - Low	$V_{OL} - V_{CC}$	-1.810		-1.475	V
RX Data Output - High	$V_{OH} - V_{CC}$	-1.165		-0.880	V

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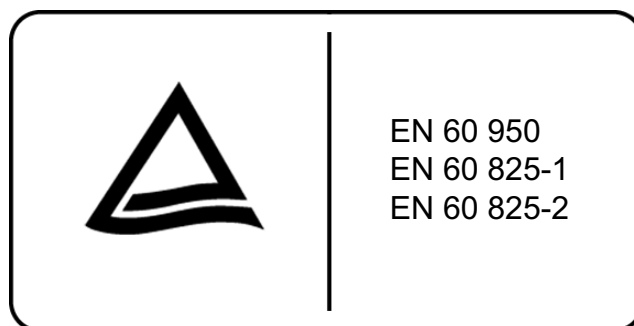
Fast Ethernet, OC-3 and STM-1 applications

REGULATORY COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883-3015.7	ESD	Class II	2200V
IEC-801-2	ESD	Human Body Model	25KV
IEC-801-3	EMI	Immunity	10V/M
FCC	EMI	Class B	>20dB
EN 55022 (CISPR 22A)	EMI	Class B	10V/M
IEC-825 Issue 1993-11	Eye Safety	Class 1	TUV Certificate Number R 2171007
FDA CDRH 21-CFR 1040	Eye Safety	Class 1	CDRH Accession Number 9930009



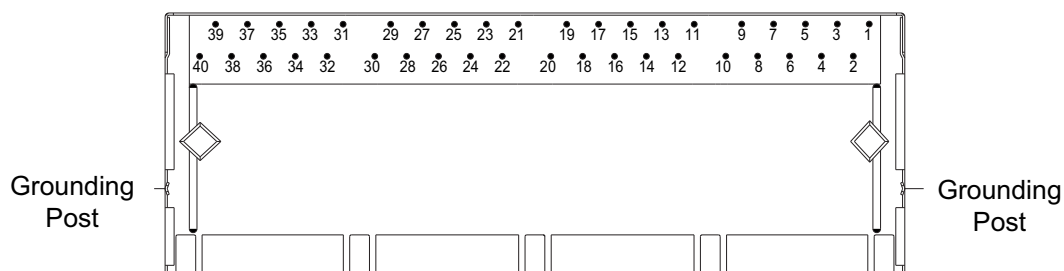
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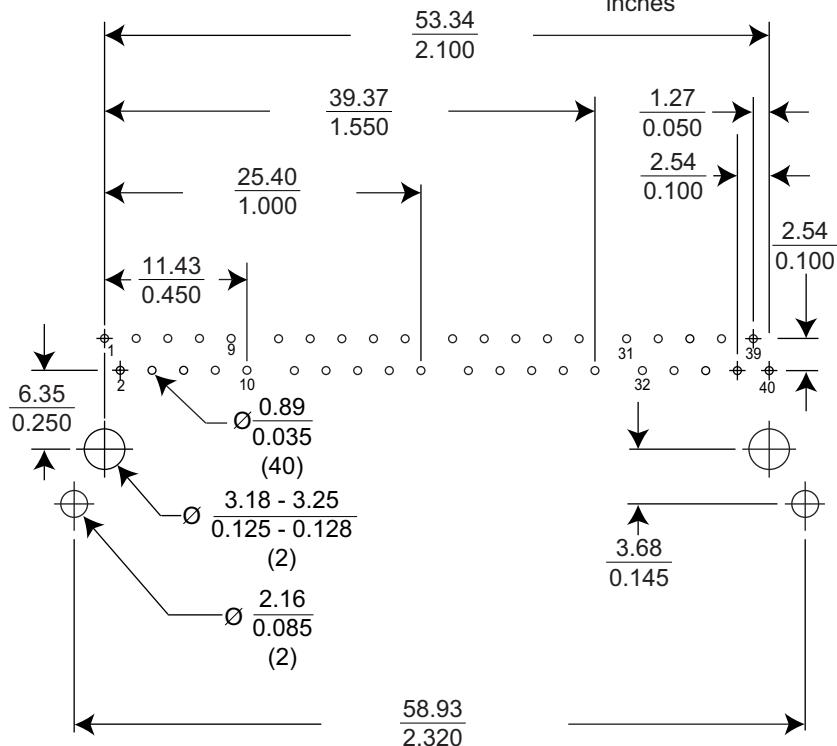
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Fast Ethernet, OC-3 and STM-1 applications

Bottom View of Component



Dimensions Are Shown As: $\frac{\text{mm}}{\text{inches}}$



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PIN FUNCTIONS

Pin Number	Symbol	Description	Logic Family
GP	GP	Grounding Posts Connect to signal ground	N/A
1, 11, 21, 31	TD+	Transmitter DATA In	LVPECL
2, 12, 22, 32	VEETX	Transmitter Signal Ground	N/A
3, 13, 23, 33	TD-	Transmitter DATA In	LVPECL
4, 14, 24, 34	VCCTX	Transmitter Power Supply	N/A
5, 15, 25, 35	SD	Signal Detect Satisfactory Optical Input: Logic "1" Output Fault Condition: Logic "0" Output	R14x-xPx2xx LVPEL R14x-xTx2xx LVTTTL
6, 16, 26, 36	TDIS	Transmit Disable	LVTTTL
7, 17, 27, 37	RD+	Receiver DATA Out	LVPECL
8, 18, 28, 38	VCCR _X	Receiver Power Supply	N/A
9, 19, 29, 39	RD-	Receiver DATA Out	LVPECL
10, 20, 30, 40	VEER _X	Receiver Signal Ground	N/A

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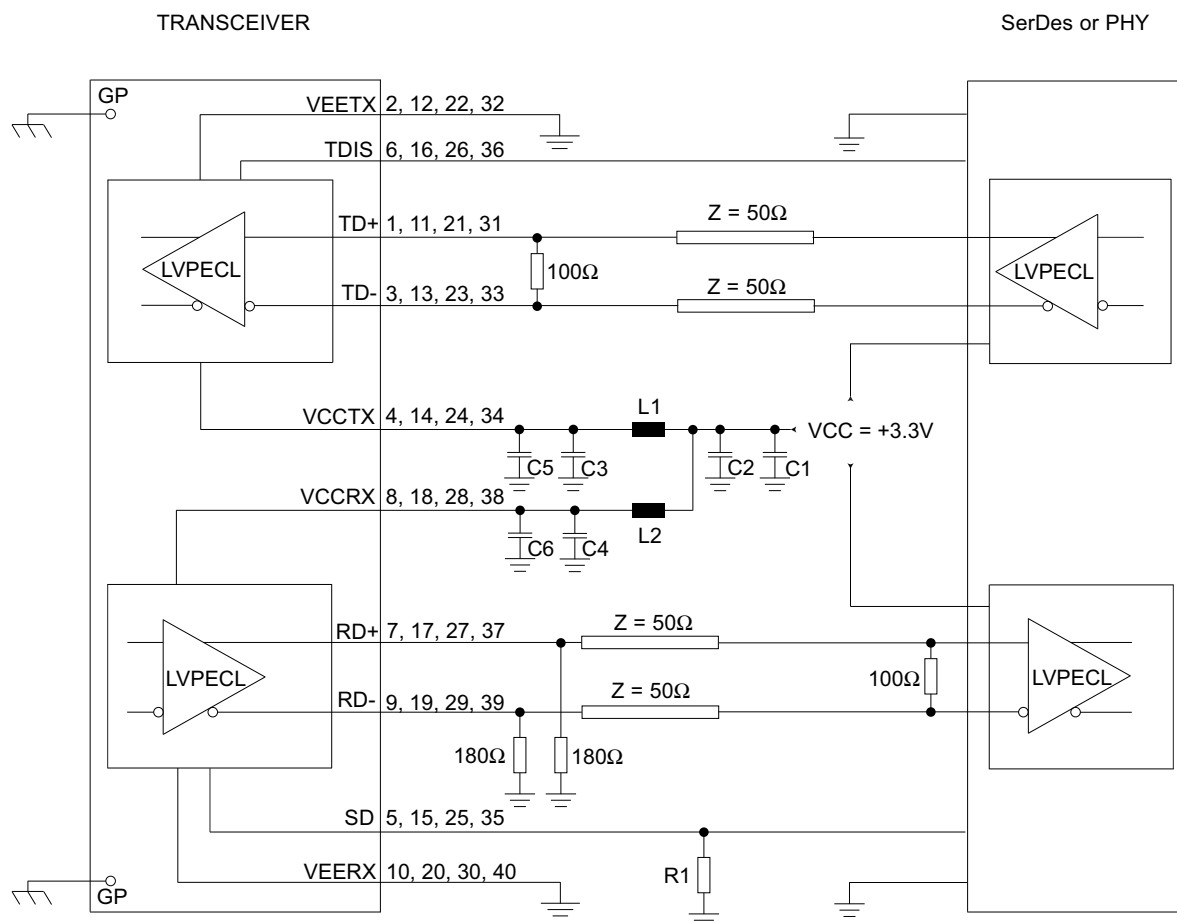
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TRANSCEIVER APPLICATION SCHEMATIC

For Interface To +3.3V DC Coupled Circuits

Each R14x series unit consists of 4 individual transceivers, as such, all termination components and VCC filtering must be duplicated for each port



R1= 150Ω for R14x-xPxxxx, remove for R14x-xTxxxx
L1, L2 = MuRata BLM21A601S or equivalent (600Ω@100MHz or better)
C1= 22.0μF to 47.0μF
C3, C4= 10.0μF
C2, C5, C6= 0.01μF

The inputs are internally buffered to Vbb (Vcc-1.3V). The R14x accepts a wide range of inputs from 300mV differential to 1.25V differential provided that no input exceeds Vcc or ground and the "high" is greater than 2.0 volts (with respect to ground).

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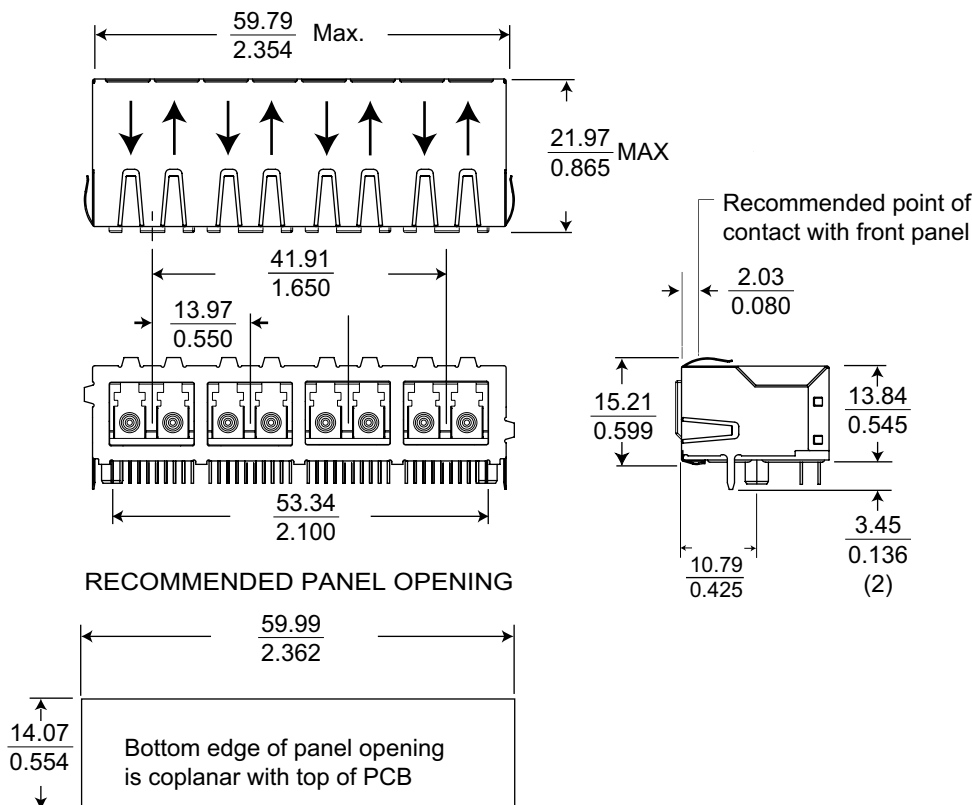
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QUAD PORT RJ FORMAT TRANSCEIVER OUTLINE DRAWING

Dimensions Shown As: $\frac{\text{mm}}{\text{inches}}$



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