R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 meters

FEATURES

- Four Port RJ Format optical transceiver - duplex LC interface
- Optimized for 62.5 or 50/125µ multimode optical fiber
- Compatible with wave solder and aqueous wash processes
- Enables reuse of existing RJ-45 UTP equipment cabinets
- Overall metal shield with enhanced grounding tabs
- Full compliance to IEEE and ANSI requirements
- Differential LVPECL inputs and outputs
- Single +3.3 V power supply per port

APPLICATIONS

The R14K-ST11 multimode glass optical fiber transceivers provide low profile, cost effective solutions for high datarate, multimode (up to 1.5 Gigabaud, up to 550 Meters) optical fiber data links with a multimode duplex LC connector interface.

These transceivers are fully compliant with the IEEE Gigabit Ethernet and ANSI Fibre Channel standards but can be used for any other data communications purpose within their operating parameters.

DESCRIPTION

The R14K-ST11 fiber optic transceivers consist of four transmitter and receiver functions integrated into a four port RJ Format harmonica module. The optical transmitters are high output 850nm VCSELs. The transmitter input lines are driven with differential LVPECL signals applied to the Transmit (TX+ and TX-) pins. These signals are internally converted to suitable modulation currents by CMOS integrated circuits. The optical transmitters can be disabled by applying LVTTL signals to the Transmit Disable (TDIS) pins.

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 a single ended LVTTL signal detect functions on the Signal Detect (SD) pins.

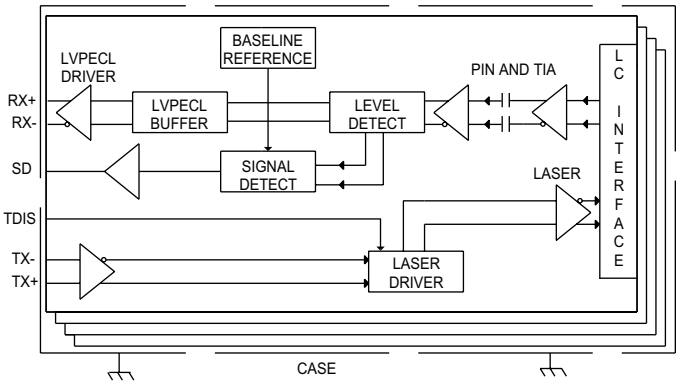
ORDERING INFORMATION

Application	Description	Temp. Range	Part Number
Gigabit Ethernet Fibre Channel	1000Base-SX ANSI X3.297	0 to +70° C	R14K-ST11
Gigabit Ethernet Fibre Channel	1000Base-SX ANSI X3.297	-40 to +85° C	R14K-ST11H

TRANSMISSION DISTANCES

Application	Media	Distance
Gigabit Ethernet IEEE - 802.3z	62.5/125 - 160MHz*Km	220M
	62.5/125 - 200MHz*Km	275M
	50/125 - 400MHz*Km	500M
	50/125 - 500MHz*Km	550M
Fibre Channel ANSI X3.297	62.5/125 - 160MHz*Km	300M
	50/125 - 500MHz*Km	500M

BLOCK DIAGRAM



STRATOS Lightwave™

1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com

R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 Meters

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		+6.0	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 xxx-xxxx Part Number xxx-xxxxH	T_A	 0 -40		 +70 +85	° C
Supply Voltage	V_{CC}	+3.135		+3.465	V
TX Differential Input Voltage (p-p)	V_D	0.350	0.800	1.250	V
Transmit Disable Voltage	V_{TD}	V_{CC} - 1.3		V_{CC}	V
Transmit Enable Voltage	V_{TEN}	V_{EE}		V_{EE} + 0.8	V
RX Data Output Load	R_L		50		Ohms

STRATOS Lightwave™

1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com

R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 Meters

TRANSMITTERS

T_A = Operating Temperature Range, VCCTX = 3.15V to 3.45V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		0.25		1.5	GBaud
Optical Output Power[1]	P_O	-9.5		-4.0	dBm
Optical Output Wavelength	λ_{OUT}	830	850	860	nm
Spectral Width (RMS)	$\Delta\lambda_{RMS}$			0.85	nm
Extinction Ratio	ER	9			dB
Optical Rise / Fall Time (20% - 80%)	t_R, t_F			0.26	nS
Relative Intensity Noise	RIN			-117	dB / Hz
Total Jitter	TJ			227	pS
Coupled Power Ratio	CPR	9			dB

1. BER=10^{-12} @ 1.25 Gbaud, PRBS 2^7-1, NRZ, Compliant with IEEE 802.3z and ANSI X3.297

RECEIVERS

T_A = Operating Temperature Range, VCCRX = 3.15V to 3.45V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		0.25		1.5	GBaud
Optical Wavelength	λ_{IN}	770		860	nm
Optical Sensitivity[1]	P_I	-17		0	dBm
Optical Return Loss	ORL	12	30		dB
Signal Detect Asserted	P_a			-17	dBm
Signal Detect Deasserted	P_d	-29			dBm
Signal Detect Hysteresis	P_a - P_d	1.5			dB
Signal Detect Assert Time	t_{Assert}		<10	100	µS
Signal Detect Deassert Time	$t_{Deassert}$		<10	350	µS

1. BER=10^{-12} @ 1.25 Gbaud, PRBS 2^7-1, NRZ, Compliant with IEEE 802.3z and ANSI X3.297

STRATOS Lightwave™

1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com

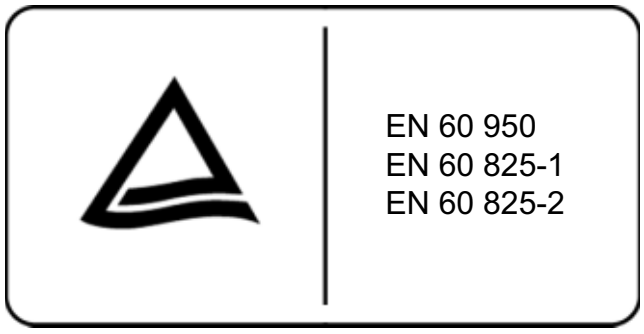
R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 Meters

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

File Number: E209124



File Number: R 2071007

STRATOS Lightwave™

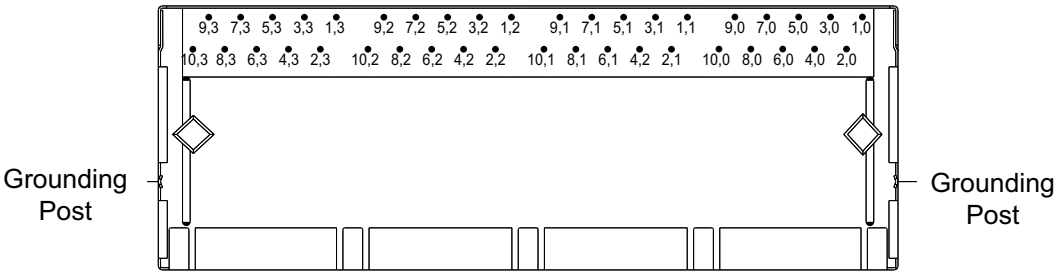
1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com

R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 Meters

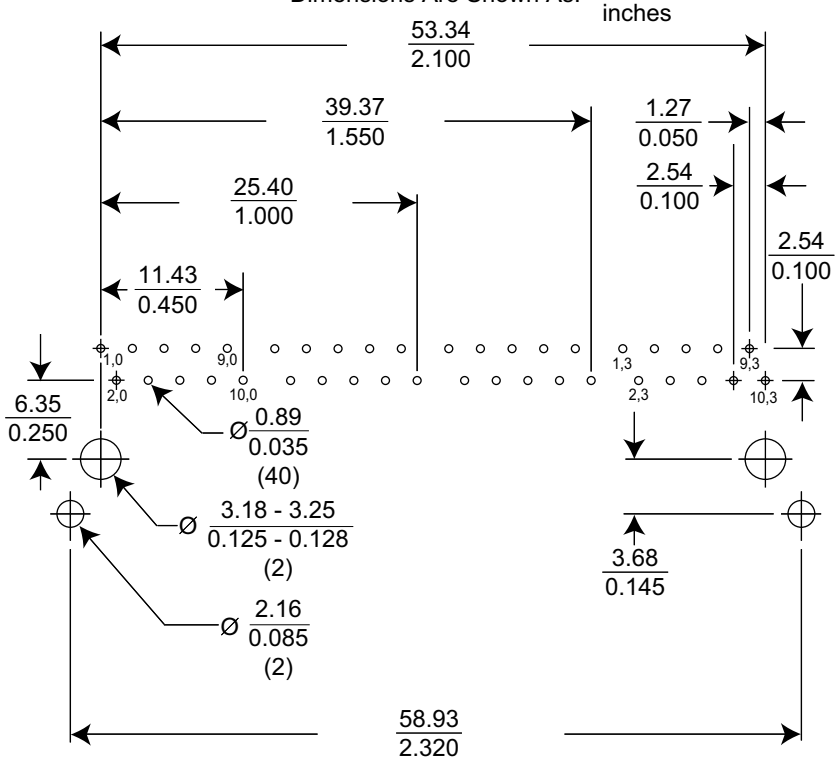
PIN NUMBER ASSIGNMENTS

Bottom View of Component
For Ports 0 to N
Pin Assignment (Pin #, Port #)



RECOMMENDED PCB HOLE LAYOUT

Top Side View
Dimensions Are Shown As: mm / inches



STRATOS Lightwave™

1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com

R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 Meters

PIN FUNCTIONS

Multiport Transceivers for Port Numbers 0 to N

Pin Number (Pin #, Port #)	Symbol (Port #)	Description	Logic Family
GP	GP	Grounding Post *Connect to Chassis Ground*	N/A
(1, 0)...(1, N)	TXD + (0:N)	Transmitter DATA In	LVPECL
(2, 0)...(2, N)	VEETX (0:N)	Transmitter Signal Ground	N/A
(3, 0)...(3, N)	TXD – (0:N)	Transmitter DATA In	LVPECL
(4, 0)...(4, N)	VCCTX (0:N)	Transmitter Power Supply	N/A
(5, 0)...(5, N)	SD (0:N)	Signal Detect *Satisfactory Optical Output: Logic "1" Output* *Fault Condition: Logic "0" Output*	LVTTL
(6, 0)...(6, N)	TDIS (0:N)	Transmitter Disable	LVTTL
(7, 0)...(7, N)	RXD + (0:N)	Receiver DATA Out	LVPECL
(8, 0)...(8, N)	VCCRX (0:N)	Receiver Power Supply	N/A
(9, 0)...(9, N)	RXD - (0:N)	Receiver DATA Out	LVPECL
(10, 0)...(10, N)	VEERX(0:N)	Receiver Signal Ground	N/A

STRATOS Lightwave™

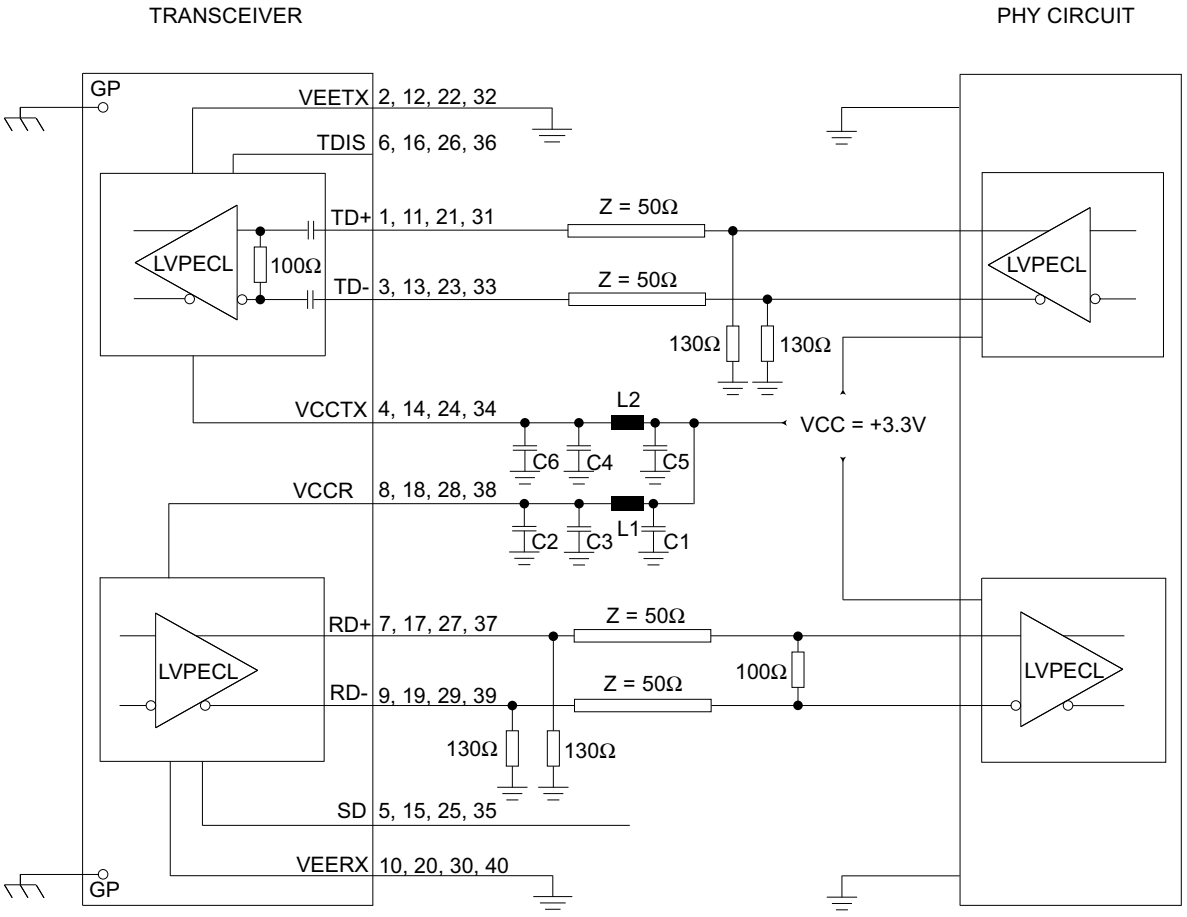
1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com

R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 Meters

TRANSCEIVER APPLICATION SCHEMATIC

For Interface To +3.3V LVPECL Circuits



L1, L2 = MuRata BLM21A601S or Equivalent
C1, C2, C6 = 10.0nF
C3, C4, C5 = 4.7µF to 10.0µF

STRATOS Lightwave™

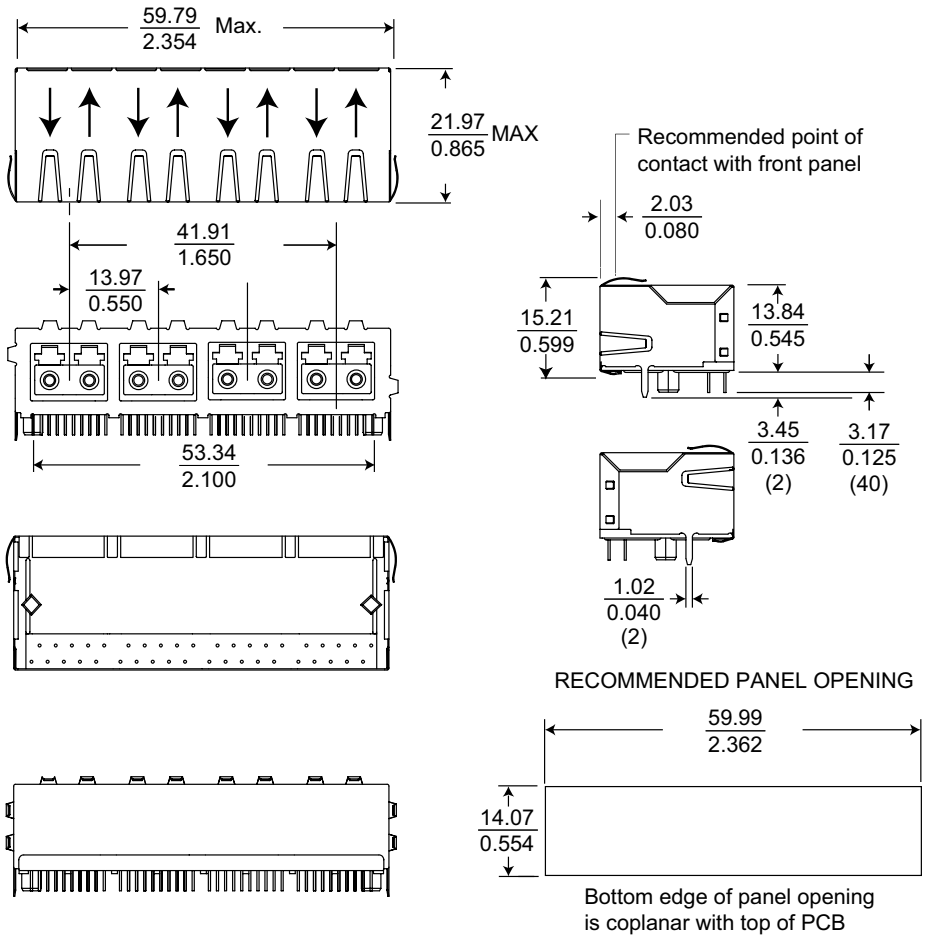
1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com

R14K-ST11 Four Port RJ Format Optical Transceiver for Gigabit Ethernet and Fibre Channel

3.3 Volts, 850nm VCSEL, Multi-Mode at up to 1.5 Gbaud, up to 550 Meters

TRANSCEIVER OUTLINE DRAWING

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



IMPORTANT NOTICE

Stratos Lightwave reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice. Stratos Lightwave recommends that its customers to obtain the latest version of the publications to verify, before placing orders, that the information being relied on is current. Stratos Lightwave warrants performance of its optical link products to current specifications in accordance with the Stratos Lightwave standard warranty. Testing and other quality control techniques are utilized to the extent that Stratos Lightwave has determined it to be necessary to support this warranty. Specific testing of all parameters of each optical link product is not necessarily performed on all optical link products. Stratos Lightwave products are not designed for use in life support appliances, devices, or systems where malfunction of a Stratos Lightwave product can reasonably be expected to result in a personal injury. Stratos Lightwave customers using or selling optical link products for use in such applications do so at their own risk and agree to fully indemnify Stratos Lightwave for any damages resulting from such improper use or sale. Stratos Lightwave assumes no liability for Stratos Lightwave applications assistance, customer product design, software performance, or infringement of patents or services described herein. Nor does Stratos Lightwave warrant or represent that a license, either expressed or implied is granted under any patent right, copyright, or intellectual property right , and makes no representations or warranties that these products are free from patent, copyright, or intellectual property rights. Applications that are described herein for any of the optical link products are for illustrative purposes only. Stratos Lightwave makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

STRATOS Lightwave™

1450 Treeland Blvd., S.E., Palm Bay, FL 32909-2211 USA
Telephone: 321-308-4100 Fax: 321-308-0434
Web Page: www.stratoslightwave.com