

OC-3 Singlemode 9 PIN SC Transceivers - Intermediate Reach**Product Facts**

- Intermediate Reach
- Complies with SONET OC-3 SDH STM1 S-1.1 or STM1 L-1.1
- Conforms to the 9-Pin Industry Standard Form Factor
- Single power supply (either 3.3V or 5V)
- PECL and LVPECL data Interface
- Transmitter uses 1300nm FP laser
- Class 1 Laser Safe per FDA/CDRH and IEC 60825-1
- UL 60950 recognized

Applications

- ATM 155 Mb/s Links
- SDH STM-1 Links
- Switches
- Hubs
- Routers



Tyco Electronics' Transceivers 269085-1, -2 and 1382615-1, -2, Fabry Perot based 1300 nm singlemode fiber optic transceivers, are specified for use in SONET OC-3 Intermediate Reach (IR) applications. Tyco Electronics, recognizing the market need for a 9-pin transceiver, has developed these transceivers with an SC duplex optical interface.

These transceivers are designed to send and receive pre-encoded data over either singlemode or multimode optical fibers and operates from either a +3.3V or +5V power supply. They also contain separate DC-coupled transmitter and receiver sections

that have PECL/LVPECL compatible data interfaces.

Tyco Electronics also offers a wide variety of Small Form Factor (SFF) and Small Form-factor Pluggable (SFP) transceivers for both singlemode and multimode applications.

These Tyco Electronics' OC-3 9-Pin transceivers have been extensively tested to comply with SONET OC-3 SDH STM1 S-1.1 or SONET OC-3 SDH STM1 L-1.1. The Fabry Perot based transmitter is certified to be Class 1 laser safe, as defined by U.S. and international standards. Units are supplied with process plugs.

Application	Part Number	
	5 Volt Only	3.3 or 5 Volt
Intermediate Reach	269085-1	1382615-1
Intermediate Reach (blue shroud)	269085-2	1382615-2

OC-3 Singlemode 9 PIN SC Transceivers - Intermediate Reach (Continued)**OC-3 Singlemode
9-Pin SC Transceiver -
Intermediate Reach****Part Numbers****269085-1****269085-2****1382615-1****1382615-2****Transmitter Performance Specifications: (Intermediate Reach)****($T_C = 0$ to 70°C , $V_{CC} - V_{EE} = 4.75$ to 5.25V DC)**

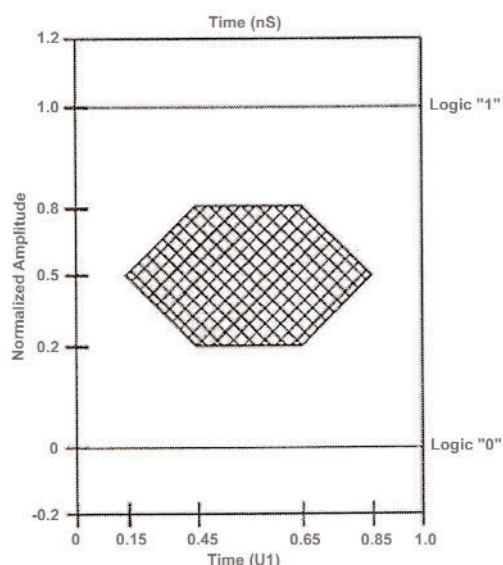
Parameter	Symbol	Notes	Min	Typ	Max	Units
Data Rate (NRZ)	B		2		156	Mb/s
Optical Output (avg.) (9/125 μm)	P_{OH}	1,2	-14	—	-8	dBm
Extinction Ratio (POL/POH) x 100%	—	3	8.2	—	—	%
Optical Wavelength	λ_{OUT}	4	1261	1310	1360	nm
Spectral Width (RMS)	$\Delta\lambda$	4	—	—	7.7	nm
Output Risetime	t_{TLH}	—	.6	1.2	2.5	ns
Output Falltime	t_{THL}	—	.6	1.2	2.5	ns
Data (3) (4)	V_{IL} V_{IH}	5	$V_{CC} - 1.81$ $V_{CC} - 1.165$	—	$V_{CC} - 1.475$ $V_{CC} - 0.88$	V V
Inputs	I_{IL} I_{IH}	5	-2 —	—	— 400	μA μA
Power Supply Voltage	$V_{CC} - V_{EE}$	—	4.75	5.0	5.25	V
Supply Current	I_{CC} or I_{EE}	—	—	—	140	mA
Operating Temperature	T_A	—	0	—	70	$^\circ\text{C}$

Note: All optical measurements made with a 3 meter patch cable using ITU-T Recommendation G.652 compliant singlemode fiber.

- Transmitter pulse shape characteristics including Rise Time, Overshoot, Jitter, and Ringing are specified in the form of an eye diagram below. Conformance to eye mask is evaluated using an optical reference receiver and filter as recommended in T1E, 2/93-020R3 Annex A and ITUT G.957.
- PIN Plating: 150 microinches min. 93.7 TIN lead over 50/150 microinches NI.
- Ons clock offset, $V_{CC} = 5\text{V}$, 25°C , 2^{23} -1 PRBS. 2dB is budgeted to open the eye from 0-2ns.
- Mates with optical connectors meeting JIS C 5973.
- Unit provided with process plug to protect optical parts during soldering and cleaning processes.
- Meets Class 1 safety requirements for each of the following: IED 825-1 and IEC 825-2: 1994, CENELEC EN 60825-1/03.94 and EN 60825-2/01.94 and U. S. Department of Health Services 21 CFR 1040.10 and 1040.11 when operated within the specified temperature, power supply, and duty cycle ranges.
- Case Material UL 94 V0 rated.
- Caution: the use of optical instruments will increase eye hazard. Optical instruments should not be used to view the laser output.
- Ground pins #1 and #9 are not internally connected.

Absolute Maximum Ratings:

Parameter	Symbol	Min.	Typical	Max.	Units
Storage temperature	—	-40	—	100	$^\circ\text{C}$
Lead soldering limits	—	—	—	240/10	$^\circ\text{C/s}$
Supply voltage	$V_{CC} - V_{EE}$	-.2	—	7.00	V





OC-3 Singlemode 9 PIN SC Transceivers - Intermediate Reach (Continued)

OC-3 Singlemode
9-Pin SC Transceiver -
Intermediate Reach

Part Numbers

269085-1

269085-2

1382615-1

1382615-2

Receiver Performance Specifications: (Intermediate Reach)

(T_C = 0 to 70°C, V_{CC}-V_{EE} = 4.75 to 5.25V DC)

Parameter	Symbol	Notes	Min	Typ	Max	Units
Data Rate (NRZ)	B		10	—	156	Mb/s
Optical Input Sensitivity (avg.)(3)	P _{IN}	1	-32.5	—	-8.0	dBm
Optical Wavelength	λ _{IN}	—	1261	—	1360	nm
Duty Cycle	—		40	50	60	%
Output Risetime	t _{TLH}		.5	—	2.5	ns
Output Falltime	t _{THL}		.5	—	2.5	ns
Data Output	V _{OH} V _{OL}		V _{CC} -1.025 V _{CC} -1.81	—	V _{CC} -0.88 V _{CC} -1.62	V V
Signal Detect (output)	V _A V _D	2 2	V _{CC} -1.025 V _{CC} -1.81	—	V _{CC} -0.88 V _{CC} -1.62	V V
PIN Power Levels (avg)						
Deassert	P _D	—	-42.0	—	-32.5	dBm
Assert	P _A	—	-41.0	—	-31.0	dBm
Hysteresis	—	—	1.5	2.0	—	dB
SD Delay Time						
Deassert	—	—	—	—	500	μs
Assert	—	—	—	—	50	μs
Power Supply Voltage	V _{CC} - V _{EE}	—	4.75	5.0	5.25	V
Supply Current	I _{CC} or I _{EE}	—	—	—	150	mA
Operating Temperature	T _A	—	0	—	70	°C

Note: All optical measurements made with a 3 meter patch cable using ITU-T Recommendation G.652 compliant singlemode fiber.

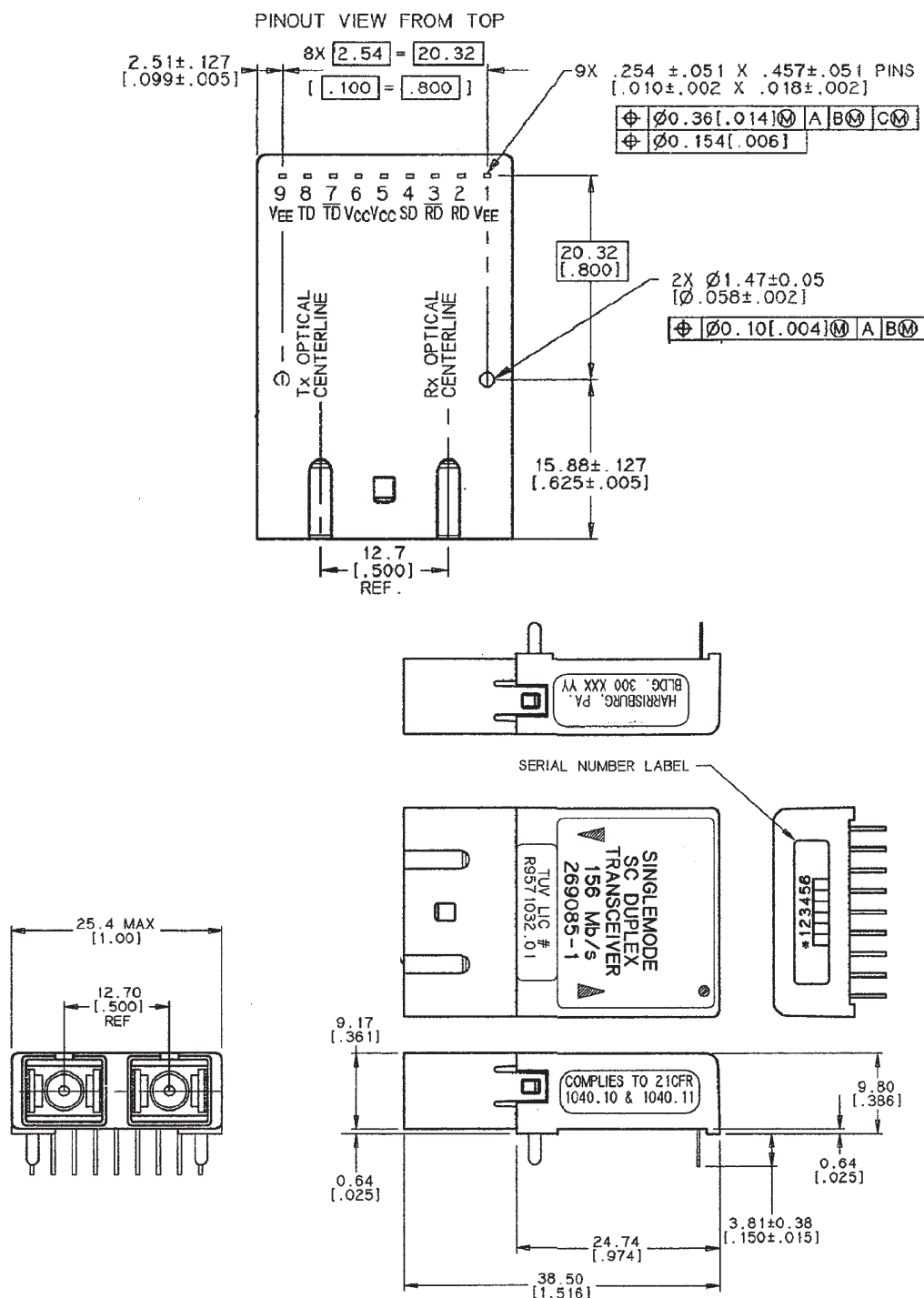
- Transmitter pulse shape characteristics including Rise Time, Overshoot, Jitter, and Ringing are specified in the form of an eye diagram. Conformance to eye mask is evaluated using an optical reference receiver and filter as recommended in T1E, 2/93-020R3 Annex A.
- PIN Plating: 150 microinches min. 93.7 TIN lead over 50/150 microinches NI.
- Ons clock offset, V_{CC} = 5V, 25° C, 2²³-1 PRBS. 2dB is budgeted to open the eye from 0-2ns.
- Mates with optical connectors meeting JIS C 5973.
- Unit provided with process plug to protect optical parts during soldering and cleaning processes.
- Meets Class 1 safety requirements for each of the following: IED 825-1 and IEC 825-2: 1994, CENELEC EN 60825-1/03.94 and EN 60825-2/01.94 and U. S. Department of Health Services 21 CFR 1040.10 and 1040.11 when operated within the specified temperature, power supply, and duty cycle ranges.
- Case Material UL 94 V0 rated.
- Caution: the use of optical instruments will increase eye hazard. Optical instruments should not be used to view the laser output.

Absolute Maximum Ratings:
(Transmitter & Receiver)

Parameter	Symbol	Min.	Typical	Max.	Units
Storage temperature	—	-40	—	100	°C
Lead soldering limits	—	—	—	240/10	°C/s
Supply voltage	V _{CC} - V _{EE}	-.2	—	7.00	V

OC-3 Singlemode 9 PIN SC Transceivers - Intermediate Reach (Continued)

Package Outline Drawings



IMPORTANT: PLEASE SEE THE TYCO ELECTRONICS' CUSTOMER DRAWING 269085 AND 1382615 FOR TRANSCEIVER HOUSING DIMENSIONS AND TOLERANCES. DRAWINGS CAN BE OBTAINED ON OUR WEBSITE AT: <http://www.tycoelectronics.com/> OR CALL AMPFAX AT 1-800-522-6752 FOR 24HR FAX SERVICE.

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For drawings, technical data or samples, contact your Tyco Electronics sales engineer, call 1-800-522-6752, or visit our Website at: <http://www.amp.com/fiberoptics>. Specifications subject to change. Consult Tyco Electronics for latest specifications.

**OC-3 Singlemode 9 PIN SC Transceivers - Intermediate Reach** (Continued)**Pin-Out Descriptions**


Symbol	PIN#	Function
$V_{EE} R_x$	1	Receiver Signal Ground [See Note 1]
RD+	2	Receiver Data Out [See Note 3]
RD-	3	Receiver Data Out Bar [See Note 3]
SD	4	Signal Detect [See Note 3]
$V_{CC} R_x$	5	Receiver Power Supply [See Note 2]
$V_{CC} T_x$	6	Transmitter Power Supply [See Note 2]
TD-	7	Transmitter Data In Bar [See Note 3]
TD+	8	Transmitter Data In [See Note 3]
$V_{EE} T_x$	9	Transmitter Signal Ground [See Note 1]

Note 1: Transmitter and Receiver grounds are isolated inside the transceiver module.

Note 2: $V_{CC} T_x$ and $V_{CC} R_x$ are isolated inside the transceiver module. Use appropriate supply filtering (see application specification)

Note 3: This is a DC coupled connection. Provide appropriate termination (see application specification)

**OC-3 Singlemode 9 PIN SC Transceivers - Intermediate Reach** (Continued)**Regulatory Compliance:**

Agency	Test Method	Listing Document
FDA	CDRH 21-CFR 1040 Class 1	Accession Number: 9122051-10
TUV	EN60825-1:1994+A11:1996 EN60825-2:1994+A1 EN60950:1992+A1+A2+A3+A4+A11	TUV Product Services Laser Class I Protection Class III TUV Certificate Number: B 02 05 46940 001
UL /  US	UL60950	E141081
IECEE CB SCHEME	IEC 60950, 3rd Edition (1999) IEC 60825-1: 1993+A1: 1997+A2:2001	US/5838/UL

ESD Testing:

Test	Test Method	Procedure
ESD1	JEDEC/EIA JESD22-A-114-A (C=100 pF, R=1500 ohm - Human body model)	Pulses applied to each pin and Ground at 1 KV
ESD2	25 KV maximum air discharge (simulates human body discharge into a DUT)	40 discharges are applied per DUT to the nose. Each module is tested with both power ON and OFF

NOTE

All products which contain a laser must comply with government regulations for laser safety. In the U.S., the applicable standard is FDA 21 CFR 1040. In other parts of the world, IEC 60825-1 applies. These transceivers were designed and tested to the requirements of the above standards and found to be in compliance with class 1 laser safety limits. When operated within the limits specified in this document, this product conforms to IEC 60825-1: 1993 + A1 : 1997 + A2: 2001, class 1 laser product, requirements.

CAUTION!

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Related Documents:

OC-3 Singlemode, 9-Pin, SC Duplex Transceivers Application Specification #114-13077