

TR1-S1-2403N-C1

Description :

The 1x9 SC duplex 1310nm O-E Transceivers can transmit digital data up to 40 km via Single-mode optical fiber and the optical performances comply with the Fast Ethernet interface, 155Mbps ATM interface and FDDI PMD Standard. Operating temperature is from -40°C to 85 °C.



Features :

- RoHS Compliant
- Distance up to 40 Km
- Industry Standard 1x9 Package Footprint
- Duplex SC Connector
- Single Power Supply 3.3V
- LVPECL Differential Data Inputs and Outputs
- LVPECL Signal Detection Output
- DC/DC Inputs and Outputs
- Operating Temperature : -40°C ~ 85 °C
- Case Color: Blue

APPLICATIONS :

- ATM 155 Mbps Links
- SONET/SDH Equipment Interconnect
- Fast Ethernet 100 Mb/s Links
- Comply with Fast Ethernet, OC-3, STM-1 and FDDI Standards
- Class 1 Laser International Safety Standard IEC 825 Compliant



RoHS Compliant

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Absolute maximum ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Storage Temperature	T_s	-40	85	°C	
Supply Voltage	V_{CC}	0	6	V	
Input Voltage	----	GND	V_{CC}	V	
Soldering Temperature	T_{SOLD}	---	260	°C	10s on leads
Output Current	I_{out}	0	30	mA	

Recommended operating conditions

PARAMETER	SYMBOL	MIN	Typ	MAX	UNITS
Ambient Operating Temperature	T_{AMB}	-40	---	85	°C
Supply Voltage	V_{CC}	3.15	3.3	3.45	V
Supply Current	I_{CC}	---	140	---	mA
Data Rate	---	---	155	---	Mb/s



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Ordering Information

TR1 - S1 - 2403N - C1			
a	b	X	c
d	e	f	g
		h	
Function parameter		may be Blank, or 000~999→ Pigtail length (unit : cm) or 0~9 → Case Color (0: Black, 1: Blue) or B/F→ Shield (B: Backward , F: Forward)	
Function distinction		may be Blank, or P (P→ Pigtail), or C (C→ Case Color) ,or S (S→ Shield)	
Potential energy & temperature		A→AC/AC PECL 0°C~70°C	I→AC/AC PECL 0°C~70°C RoHS
		B→AC/AC PECL -40°C~85°C	J→AC/AC PECL -40°C~85°C RoHS
		C→AC/AC TTL 0°C~70°C	K→AC/AC TTL 0°C~70°C RoHS
		D→AC/AC TTL -40°C~85°C	L→AC/AC TTL -40°C~85°C RoHS
		E→DC/DC PECL 0°C~70°C	M→DC/DC PECL 0°C~70°C RoHS
		F→DC/DC PECL -40°C~85°C	N→DC/DC PECL -40°C~85°C RoHS
		G→DC/DC TTL 0°C~70°C	O→DC/DC TTL 0°C~70°C RoHS
		H→DC/DC TTL -40°C~85°C	P→DC/DC TTL -40°C~85°C RoHS
Operating voltage		3→3.3V	5→5V
Distance		D1~D9 : D1→100M, D2→200M	01~99 : 01→1km, 10→10km 00→100km
Optical connector		1→FC	2→SC 3→ST 4→LC
Wavelength		M3→Multi-mode 850 nm S1→Single-mode 1310 nm	S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm
		M4→Multi-mode 1310 nm S2→Single-mode 1550 nm	S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm
		00~99 (CWDM Wavelength) : 47 → 1470 nm , 61 → 1610 nm	
		S5→For Bi-direction : Single-mode Tx13100 / Rx1310 nm	
		S6→For Bi-direction : Single-mode Tx1550 / Rx1550 nm	
Bit rate		1→155Mbps 3→1.0625Gbps 5→2.125 Gbps 7→2.7 Gbps	2→622Mbps 4→1.25 Gbps 6→2.5 Gbps 8→3.125 Gbps
Electric connector		TR→Dual Fiber 1×9 Transceiver	FB→Single Fiber SFF Transceiver
		TB→Single Fiber 1×9 Transceiver	PT→Dual Fiber SFP Transceiver
		FT→Dual Fiber SFF Transceiver	PB→Single Fiber SFP Transceiver
		PM→Dual Fiber SFP Transceiver (with optical moritor)	

* Please contact us for the released types.



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Transmitter optical Specifications (-40 °C < Topr < 85 °C, 3.15 V < Vcc < 3.45 V)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Optical						
Output Optical Power	P _{out}	-15	---	-5	dBm	1
Extinction Ratio	ER	8.2	---	---	dB	-
Extinction Ratio	ER	---	---	15	%	-
Output Eye	Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957					
Center Wavelength	λ_C	1260	1310	1360	nm	
Spectral Width(FWHM)	$\Delta\lambda$	---	---	5	nm	RMS(σ)
Rise/Fall Time	T _r ,T _f	0.6	---	2.0	ns	2
Relative Intensity Noise	RIN	---	---	-117	dB/Hz	-
Total jitter	T _j	---	---	1.2	ns	3
Deterministic Jitter	T _{DDJ}	---	---	0.6	ns	-
Random Jitter	T _{RJ}	---	---	0.69	ns	-
Electrical						
Power Supply Current	I _{cc}	---	---	160	mA	4
Differential Input Voltage	V _{IH} -V _{IL}	300	---	---	mV	5
Data Input Voltage-Low	V _{IL} - V _{cc}	-2.0	---	-1.58	V	
Data Input Voltage-High	V _{IH} - V _{cc}	-1.1	---	-0.74	V	

Notes:

1. Output power is coupled into a 9/125 μ m single-mode fiber.
2. 10% to 90% Values. Maximum t_R, t_F times tested against eye mask.
3. Measured with a 2²³-1 PRBS with 72 ones and 72 zeros.
4. Maximum current is specified at V_{cc} = Maximum @ maximum temperature.
5. These inputs are compatible with 10K, 10KH and 100K LVECL and LVPECL inputs.

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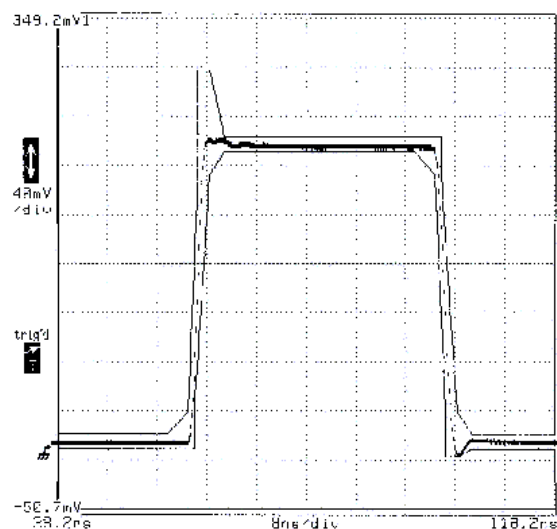
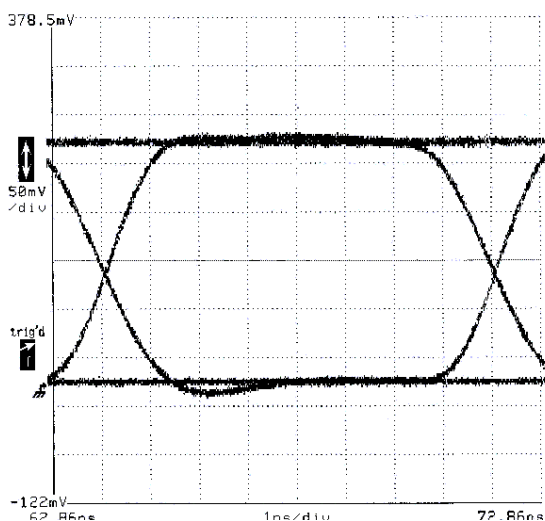
Receiver optical Specifications (-40 °C < Topr < 85 °C, 3.15 V < Vcc < 3.45 V)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Optical						
Sensitivity	P _{IN}	---	-34	-32	dBm	1
Maximum Input Power	P _{IN}	-3	---	---	dBm	-
Center Wavelength	λ _C	1270	1310	1360	nm	-
Signal Detect-Asserted	P _A	---	---	-32	dBm	Average
Signal Detect-Deasserted	P _D	-45	---	---	dBm	Average
Signal Detect-Hysteresis	P _A -P _D	---	3.0	---	dB	-
Wavelength of Operation		1100	---	1600	nm	-
Electrical						
Power Supply Current	I _{CC}	---	---	100	mA	2
Data Output Voltage-Low	V _{OL} - V _{CC}	-2.0	---	-1.58	V	3
Data Output Voltage-High	V _{OH} - V _{CC}	-1.1	---	-0.74	V	
Signal Detect Voltage-Low	V _{OL} -V _{CC}	-2.0	---	-1.58	V	
Signal Detect Voltage-High	V _{OH} -V _{CC}	-1.1	---	-0.74	V	

Notes:

1. Minimum sensitivity and saturation levels at BER=1E-10 for a 2²³-1 PRBS with 72 ones and 72 zeros.
2. The current excludes the output load current.
3. These outputs are compatible with 10K, 10KH and 100K LVECL and LVPECL outputs.

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CONNECTION DIAGRAM

Receiver Signal Ground
Receiver Data Out
Receiver Data Out Bar
Signal Detect
Receiver Power Supply
Transmitter Power Supply
Transmitter Data In Bar
Transmitter Data In
Transmitter Signal Ground

PIN.1.(RX GND)
PIN.2.(RX+)
PIN.3.(RX-)
PIN.4.(SD)
PIN.5.(RX Vcc)
PIN.6.(TX Vcc)
PIN.7.(TX-)
PIN.8.(TX+)
PIN.9.(TX GND)

TOP VIEW



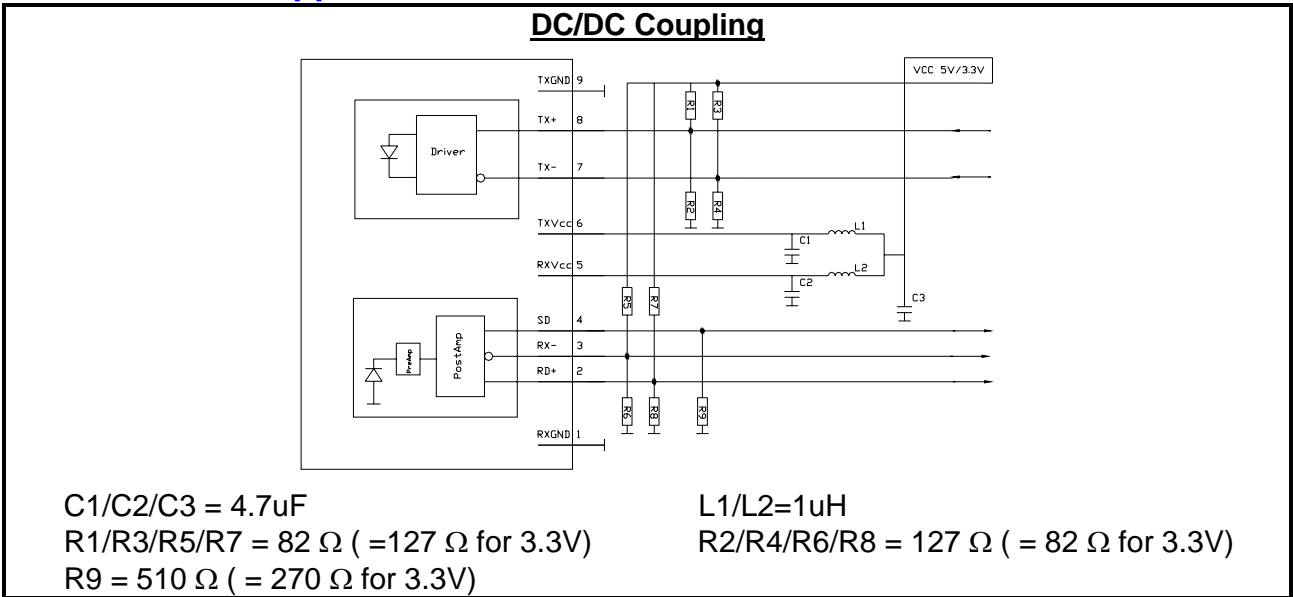
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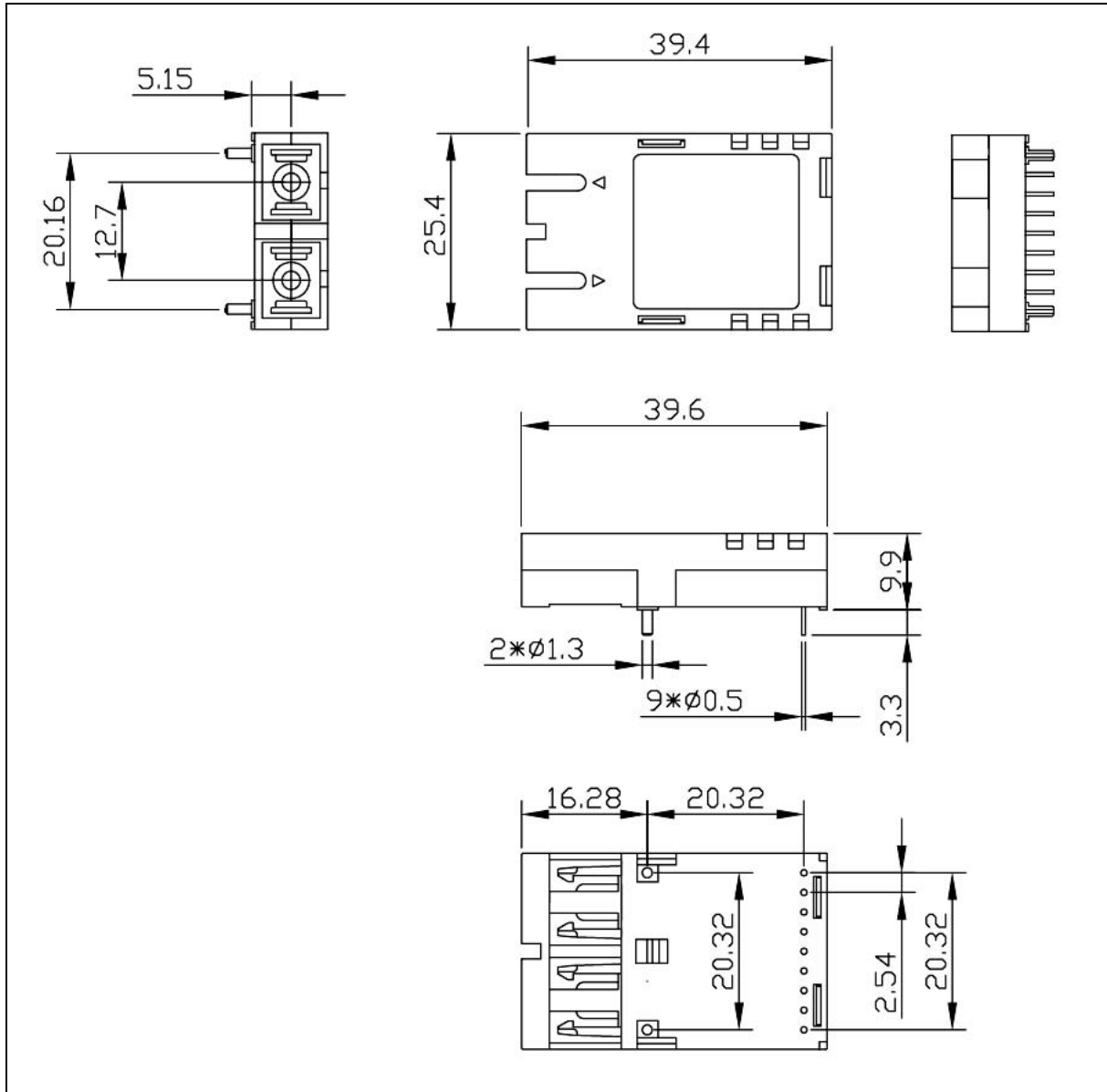
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Recommended Application Circuit



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SC Connector



Dimensions in mm