2.5 Gb/s Transponder with Mux/Demux (1310 and 1550 nm)

54TR Series

Key Features

- **MSA compatible**
- **Modular size for plug-and-play, allowing faster time-to-market for LR-1 and LR-2 applications**
- **Outstanding optical and electrical performance over both commercial and industrial temperatures**

Applications

- 1310nm and 1550 Long Reach applications
- Metro core
- Wide area networks
- Optical crossconnects
- Fiber backbone

Compliance

- Telcordia GR-253-CORE
- ITU-T G.783, ITU-T G.957, and ITU-T G.958

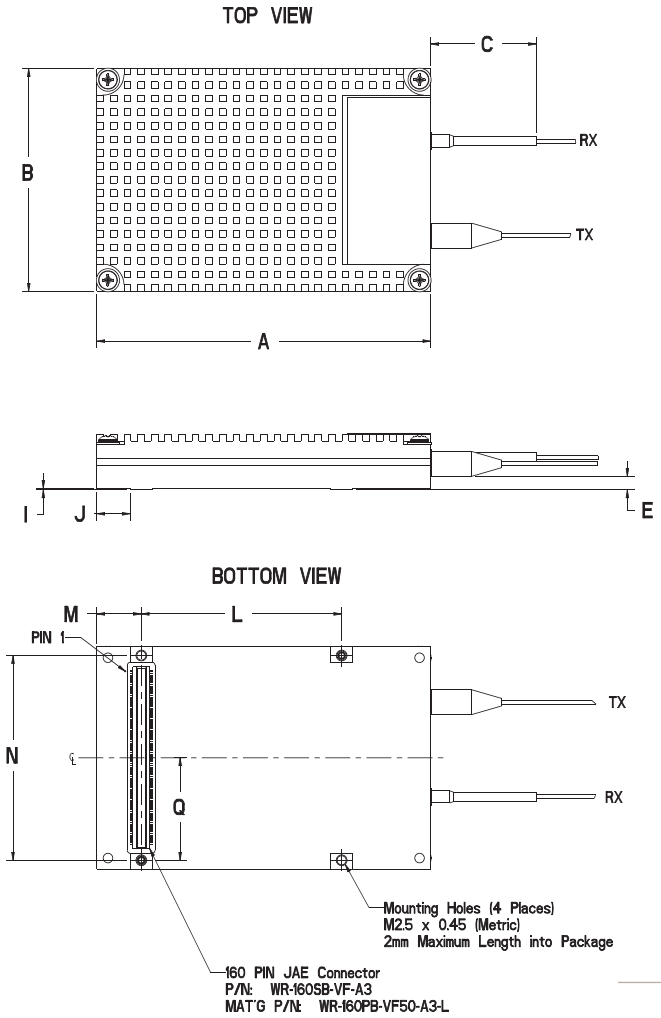
The JDSU 54TR series transponder integrates optics and electronics in an OC-48 (2.5 Gb/s) time division multiplexing (TDM) transponder module. Multisource agreement (MSA) compatible and designed for operation at 1310 and 1550 nm, it can be used across a variety of optical fiber systems.

The bidirectional modules provide a SONET or SDH compliant interface between the SONET/SDH photonic physical layer and the electrical layer. Major components include distributed feedback (DFB) based optical transmitter; an Avalanche photodiode (APD) optical receiver with transimpedence amplifier (TIA); a microcontroller; a laser driver; and an integrated 16 signal mux/demux with clock and data recovery (CDR) circuitry.

The transponder provides either 1310 or 1550 nm wavelengths and is available in an APD receiver configuration. It receives a 2488.32 Mb/s optical signal, converts it to an electrical signal, recovers the clock, and demultiplexes the data into sixteen 155 Mb/s differential low voltage positive emitter coupled logic (LVPECL) data signals. The transponder is available in LR-1 or LR-2 configurations.

Dimensions Diagram

(Specifications in inches unless otherwise noted.)



Dimension	Minimum	Nominal	Maximum
A	2.995	3.000	3.040
B	1.995	2.000	2.040
C	0.65	0.90	1.0
D	0.483	0.494	0.517
E	0.100	0.122	0.132
F	0.610	0.650	0.690
G	0.460	0.500	0.540
I	0.015	0.015	0.020
J	0.300	0.305	0.310
L	1.786	1.800	1.814
M	0.386	0.400	0.414
N	1.826	1.840	1.854
Q	0.906	0.920	0.934

Absolute Maximum Ratings[1]

Parameter	Minimum	Maximum
Standard operating case temperature range	-5 °C	70 °C
Extended operating case temperature range	-40 °C	80 °C
Storage case temperature range	-40 °C	85 °C
Supply voltage	-0.5 V	4.0 V
Operating relative humidity (non-condensing)	5%	85%
Operating short-term relative humidity[2,3]	5%	90%
Receiver optical input power for APD	-	-3 dBm

1. Limiting values apply to the 54TR within entire operating range unless otherwise specified.
2. Short-term refers to a period of not more than 72 consecutive hours and a total of not more than 15 days in one year. (This refers to a total of 360 hours in any given year, but no more than 15 occurrences during that one-year period.)
3. Not to exceed 0.024 lbs. of water/lb. of dry air.

Optical Specifications (note[1])	Long reach/long haul (DFB laser, APD receiver) 1310 nm

Parameter	**Minimum**	**Typical**	**Maximum**
Average output power (note[2]) (BOL)	0 dBm	1 dBm	1.5 dBm
Average output power (note[2]) (EOL)	-2 dBm	0 dBm	1.5 dBm
Operating wavelength	1280 nm	1310 nm	1335 nm
Extinction ratio (note[3]) (BOL)	9.5 dB	10.0 dB	10.5 dB
Extinction ratio (note[3]) (EOL)	8.2 dB	-	-
Optical rise and fall times	-	-	200 ps
Eye mask of optical output (note[4,5])		Compliant with GR-253 and ITU-T G.957	
Jitter generation (peak-to-peak)	-	-	85 mUI
Jitter generation (rms)	-	-	8 mUI
Average receiver sensitivity (note[6,7]) (BOL, BER = 1 x 10^{-12})	-30 dBm	-31 dBm	-
Average receiver sensitivity (note[6,7]) (EOL, BER = 1 x 10^{-12})	-29 dBm	-	-
Maximum received optical power	-8 dBm	-	-
Dispersion	-	-	250 ps/nm
Optical path penalty (at 60 km)	-	0.2 dB	1.0 dB
Jitter tolerance and jitter transfer		Compliant with GR-253 and ITU-T G.958	
BER floor	-	-	10^{-15}

Optical Specifications (note[1])	Long reach/long haul 1550 nm (DFB laser, APD receiver)

Parameter	**Minimum**	**Typical**	**Maximum**
Average output power (note[2]) (BOL)	-0.5 dBm	1 dBm	2 dBm
Average output power (note[2]) (EOL)	-2 dBm	1 dBm	3 dBm
Operating wavelength	1500 nm	1550 nm	1580 nm
Extinction ratio (note[3]) (BOL)	9.0 dB	9.7 dB	10.5 dB
Extinction ratio (note[3]) (EOL)	8.2 dB	-	-
Eye mask of optical output (note[4,5])		Compliant with GR-253 and ITU-T G.957	
Jitter generation (peak-to-peak)	-	-	85 mUI
Jitter generation (rms)	-	-	8 mUI
Average receiver sensitivity (note[6,7]) (BOL, BER = 1x10^{-12})	-30 dBm	-31 dBm	-
Average receiver sensitivity (note[6,7]) (EOL, BER = 1x10^{-12})	-29 dBm	-	-
Maximum received optical power	-8 dBm	-	-
Dispersion	-	-	1600 ps/nm
Optical path penalty (at 98 km, dispersion = 1600 ps/nm)	-	1.3 dB	2.0 dB
Jitter tolerance and jitter transfer		Compliant with GR-253 and ITU-T G.783	
BER floor	-	-	10^{-15}

1. The following optical values apply to the 54TR within entire operating range unless otherwise specified.
2. Output power definitions and measurements per ITU-T recommendation G.957.
3. Ratio of logic 1 output power to logic 0 output power under fully modulated conditions.
4. GR-253-CORE, synchronous optical network (SONET) transport systems: common generic criteria.
5. ITU-T recommendation G.957, optical interfaces for equipment and systems relating to the synchronous digital hierarchy.
6. At 1x10^{-12} BER, 2^{23-1} pseudo-random data input, and an extinction ratio of 10 dB.
7. For the extended temperature version, the BOL and EOL receiver sensitivity is reduced by 1 dB from -5 to -40 °C.

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Sample: 54TR-21114

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Code	Wavelength Option
2	1310 nm
3	1550 nm

Code	Connector Type
1	SC/SPC
2	ST/SPC
3	LC/SPC
4	FC/SPC
5	MU/SPC

Code	Temperature Range
1	Standard, -5 to 70 °C
2	Extended, -40 to 80 °C
3	Intermediate, -5 to 75 °C

Code	Optical Reach
1	Long reach

Code	IPDMON Maximum Current Output
0	Not required
1	1 mA
2	2 mA
3	3 mA
4	4 mA