

# DS96176/μA96176 RS-485/RS-422 Differential Bus Transceiver

# **General Description**

The DS96176/µA96176 Differential Bus Transceiver is a monolithic integrated circuit designed for bidirectional data communication on balanced multipoint bus transmission lines. The transceiver meets EIA Standard RS-485 as well as RS-422A.

The DS96176/µA96176 combines a TRI-STATE® differential line driver and a differential input line receiver, both of which operate from a single 5.0V power supply. The driver and receiver have an active Enable that can be externally connected to function as a direction control. The driver differential outputs and the receiver differential inputs are internally connected to form differential input/output (I/O) bus ports that are designed to offer minimum loading to the bus whenever the driver is disabled or when  $V_{CC} = 0V$ . These ports feature wide positive and negative common mode voltage ranges, making the device suitable for multipoint applications in noisy environments.

The driver is designed to handle loads up to 60 mA of sink or source current. The driver features positive and negative current-limiting and thermal shutdown for protection from line fault conditions. Thermal shutdown is designed to occur at junction temperature of approximately 160°C. The receiver features a typical input impedance of 15 k $\Omega$ , an input sensitivity of ±200 mV, and a typical input hysteresis of 50 mV.

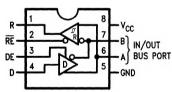
The DS96176/ $\mu$ A96176 can be used in transmission line applications employing the DS96172/µA96172 and the DS96174/µA96174 quad differential line drivers and the DS96173/µA96173 and DS96175/µA96175 quad differential line receivers.

### **Features**

- Bidirectional transceiver
- Meets EIA Standard RS-422A and RS-485
- Designed for multipoint transmission
- TRI-STATE driver and receiver enables
- Individual driver and receiver enables
- Wide positive and negative input/output bus voltage
- Driver output capability ±60 mA Maximum
- Thermal shutdown protection
- Driver positive and Negative current-limiting
- High impedance receiver input
- Receiver input sensitivity of ±200 mV
- Receiver input hysteresis of 50 mV typical
- Operates from single 5.0V supply
- Low power requirements

# **Connection Diagram**

#### 8-Lead DIP



TL/F/9630-1

**Top View** 

Order Number DS96176J, µA96176RC See NS Package Number J08A\*

Order Number DS96176N, µA96176TC See NS Package Number N08E

# **Function Table**

#### Driver

| Differential Inputs | Enable | Out | puts |
|---------------------|--------|-----|------|
| D                   | DE     | A   | В    |
| Н                   | н      | н   | L    |
| L                   | Н      | L   | Н    |
| X                   | L      | Z   | Z    |

### Receiver

| Differential Inputs    | Enable | Output |
|------------------------|--------|--------|
| A-B                    | RE     | R      |
| V <sub>ID</sub> ≥ 0.2V | L      | H      |
| $V_{ID} \leq -0.2V$    | L      | L      |
| X                      | н      | Z      |

H = High Level

L = Low Level

X = Immaterial

Z = High Impedance (off)

<sup>\*</sup>For most current package information, contact product marketing.