

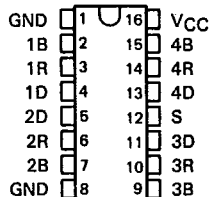
# AM26S10C, AM26S11C QUADRUPLE BUS TRANSCEIVERS

T-52-31

D2298, JANUARY 1977—REVISED MAY 1990

- Schottky Circuitry for High Speed, Typical Propagation Delay Time . . . 12 ns
- Drivers Feature Open-Collector Outputs for Party-Line (Data Bus) Operation
- Driver Outputs Can Sink 100 mA at 0.8 V Maximum
- P-N-P Inputs for Minimal Input Loading
- Designed to Be Interchangeable With Advanced Micro Devices AM26S10 and AM26S11

AM26S10C, AM26S11C . . . D, J, OR N PACKAGE  
(TOP VIEW)



## TEXAS INSTR (LIN/INTFC)

### description

The AM26S10 and AM26S11 are quadruple bus transceivers utilizing Schottky-diode-clamped transistors for high speed. The drivers feature open-collector outputs capable of sinking 100 mA at 0.8 V maximum. The driver and strobe inputs use p-n-p transistors to reduce the input loading.

The driver of the AM26S10 is inverting; the driver of the AM26S11 is noninverting. Each device has two ground connections for improved ground current-handling capability. For proper operation, the ground pins should be tied together.

The AM26S10C and AM26S11C are characterized for operation over the temperature range of 0°C to 70°C.

AM26S10  
FUNCTION TABLE  
(TRANSMITTING)

| INPUTS |   | OUTPUTS |   |
|--------|---|---------|---|
| S      | D | B       | R |
| L      | H | L       | H |
| L      | L | H       | L |

AM26S11  
FUNCTION TABLE  
(TRANSMITTING)

| INPUTS |   | OUTPUTS |   |
|--------|---|---------|---|
| S      | D | B       | R |
| L      | H | H       | L |
| L      | L | L       | H |

AM26S10 AND AM26S11  
FUNCTION TABLE  
(RECEIVING)

| INPUTS |   |   | OUTPUT |
|--------|---|---|--------|
| S      | B | D | R      |
| H      | H | X | L      |
| H      | L | X | H      |

H = high level, L = low level, X = irrelevant

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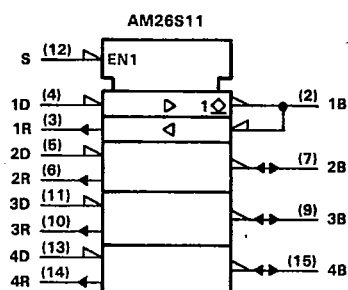
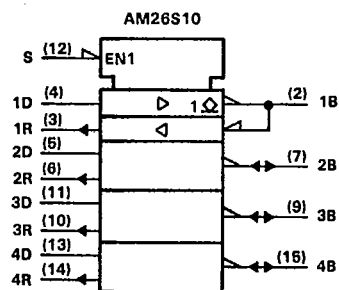
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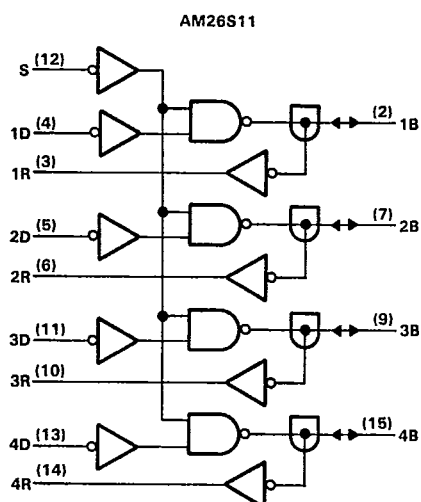
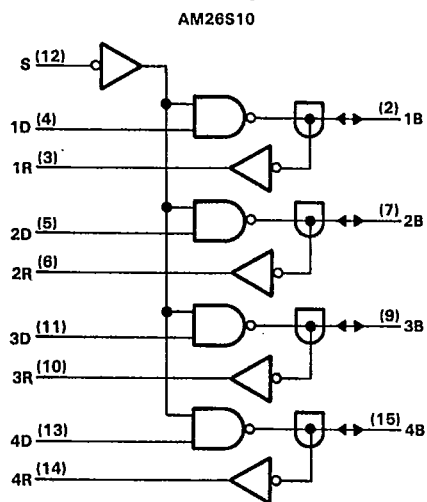
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logic symbols†



†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagrams (positive logic)



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AM26S10C, AM26S11C  
QUADRUPLE BUS TRANSCEIVERS

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## TEXAS INSTR (LIN/INTFC)

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

|                                                                              |                              |
|------------------------------------------------------------------------------|------------------------------|
| Supply voltage range, $V_{CC}$ (see Note 1)                                  | -0.5 V to 7 V                |
| Driver or strobe input voltage range                                         | -0.5 V to 5.5 V              |
| Bus voltage range, driver output off                                         | -0.5 V to 5.25 V             |
| Driver or strobe input current range                                         | -30 mA to 5 mA               |
| Driver output current                                                        | 200 mA                       |
| Receiver output current                                                      | 30 mA                        |
| Continuous total power dissipation                                           | See Dissipation Rating Table |
| Operating free-air temperature range                                         | 0°C to 70°C                  |
| Storage temperature range                                                    | -65°C to 150°C               |
| Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: J package      | 300°C                        |
| Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D or N package | 260°C                        |

NOTE 1: All voltage values are with respect to network ground terminals connected together.

DISSIPATION RATING TABLE

| PACKAGE | $T_A \leq 25^\circ\text{C}$ | DERATING FACTOR<br>ABOVE $T_A = 25^\circ\text{C}$ | $T_A = 70^\circ\text{C}$ |
|---------|-----------------------------|---------------------------------------------------|--------------------------|
|         | POWER RATING                |                                                   | POWER RATING             |
| D       | 950 mW                      | 7.6 mW/°C                                         | 608 mW                   |
| J       | 1025 mW                     | 8.2 mW/°C                                         | 656 mW                   |
| N       | 1160 mW                     | 9.2 mW/°C                                         | 736 mW                   |

## recommended operating conditions

|                                                     |          | MIN  | NOM | MAX  | UNIT |
|-----------------------------------------------------|----------|------|-----|------|------|
| Supply voltage, V <sub>CC</sub>                     |          | 4.75 | 5   | 5.25 | V    |
| High-level input voltage, V <sub>IH</sub>           | D or S   | 2    |     |      | V    |
|                                                     | B        | 2.25 |     |      |      |
| Low-level input voltage, V <sub>IL</sub>            | D or S   | 0.8  |     |      | V    |
|                                                     | B        | 1.75 |     |      |      |
| Receiver high-level output current, I <sub>OH</sub> |          | - 1  |     |      | mA   |
| Low-level output current, I <sub>OL</sub>           | Driver   | 100  |     |      | mA   |
|                                                     | Receiver | 20   |     |      |      |
| Operating free-air temperature, T <sub>A</sub>      |          | 0    |     | 70   | °C   |



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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER    |                                        |                           | TEST CONDITIONS                                                                                          |                                                   | MIN | TYP† | MAX   | UNIT          |
|--------------|----------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----|------|-------|---------------|
| $V_{IK}$     | Input clamp voltage                    | D or S                    | $V_{CC} = 4.75 \text{ V}$ , $I_I = -18 \text{ mA}$                                                       |                                                   |     |      | -1.2  | V             |
| $V_{OH}$     | High-level output voltage              | R                         | $V_{CC} = 4.75 \text{ V}$ , $V_{IH} = 2 \text{ V}$ , $V_{IL} = 0.8 \text{ V}$ , $I_{OH} = -1 \text{ mA}$ |                                                   | 2.7 | 3.4  |       | V             |
| $V_{OL}$     | Low-level output voltage               | R                         | $V_{CC} = 4.75 \text{ V}$ , $V_{IH} = 2 \text{ V}$ , $V_{IL} = 0.8 \text{ V}$                            | $I_{OL} = 20 \text{ mA}$                          |     |      | 0.5   | V             |
|              |                                        | $I_{OL} = 40 \text{ mA}$  |                                                                                                          |                                                   |     | 0.33 | 0.5   |               |
|              |                                        | $I_{OL} = 70 \text{ mA}$  |                                                                                                          |                                                   |     | 0.42 | 0.7   |               |
|              |                                        | $I_{OL} = 100 \text{ mA}$ |                                                                                                          |                                                   |     | 0.51 | 0.8   |               |
| $I_{O(off)}$ | Off-state output current               | B                         | $V_{IH} = 2 \text{ V}$ , $V_{IL} = 0.8 \text{ V}$                                                        | $V_{CC} = 5.25 \text{ V}$ , $V_O = 0.8 \text{ V}$ |     |      | -50   | $\mu\text{A}$ |
|              |                                        |                           |                                                                                                          | $V_{CC} = 5.25 \text{ V}$ , $V_O = 4.5 \text{ V}$ |     |      | 100   |               |
|              |                                        |                           |                                                                                                          | $V_{CC} = 0$ , $V_O = 4.5 \text{ V}$              |     |      | 100   |               |
| $I_{IH}$     | High-level input current               | D                         | $V_{CC} = 5.25 \text{ V}$ , $V_I = 2.7 \text{ V}$                                                        |                                                   |     |      | 30    | $\mu\text{A}$ |
|              |                                        | S                         |                                                                                                          |                                                   |     |      | 20    |               |
| $I_I$        | Input current at maximum input voltage | D or S                    | $V_{CC} = 5.25 \text{ V}$ , $V_I = 5.5 \text{ V}$                                                        |                                                   |     |      | 100   | $\mu\text{A}$ |
| $I_{IL}$     | Low-level input current                | D                         | $V_{CC} = 5.25 \text{ V}$ , $V_I = 0.4 \text{ V}$                                                        |                                                   |     |      | -0.54 | mA            |
|              |                                        | S                         |                                                                                                          |                                                   |     |      | -0.36 |               |
| $I_{OS}$     | Short-circuit output current‡          | R                         | $V_{CC} = 5.25 \text{ V}$                                                                                |                                                   | -18 |      | -60   | mA            |
| $I_{CC}$     | Supply current                         |                           | $V_{CC} = 5.25 \text{ V}$ , Strobe at 0 V, No load, All driver outputs low                               |                                                   |     | 45   | 70    | mA            |
|              |                                        |                           |                                                                                                          |                                                   |     |      | 80    |               |

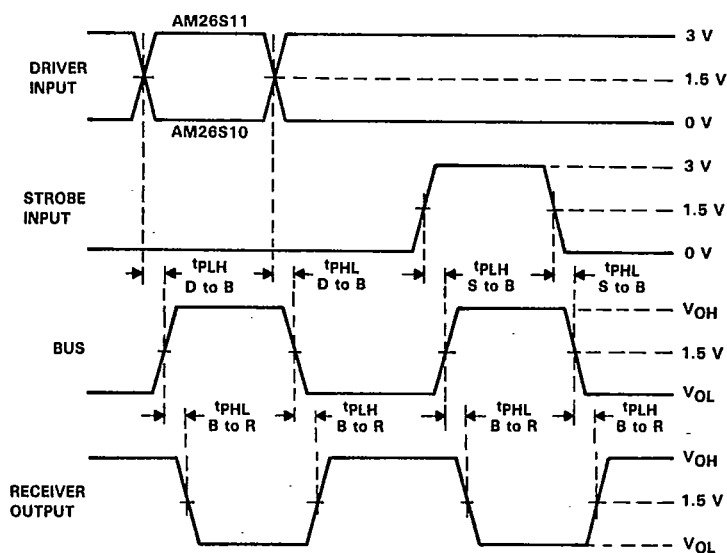
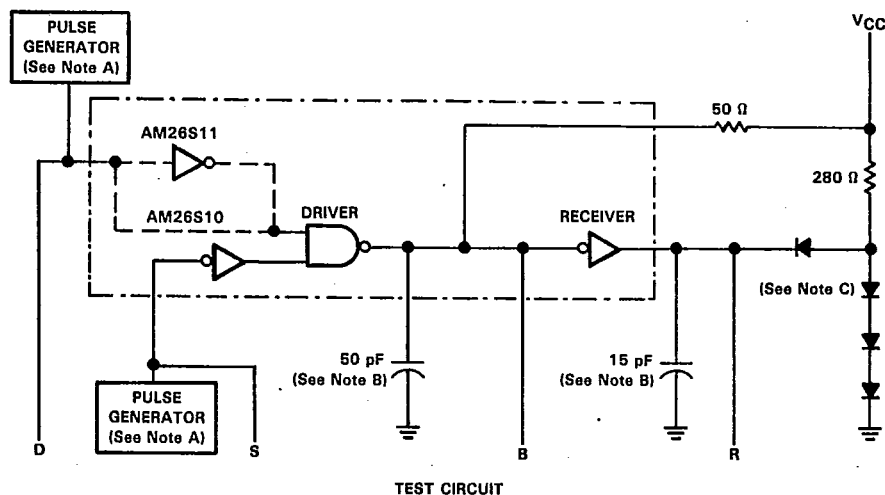
†All typical values are at  $T_A = 25^\circ\text{C}$  and  $V_{CC} = 5 \text{ V}$ .

‡Not more than one output should be shorted to ground at a time, and duration of the short circuit should not exceed one second.

switching characteristics,  $V_{CC} = 5 \text{ V}$ ,  $T_A = 25^\circ\text{C}$ 

| PARAMETER                                                         | FROM | TO | TEST<br>CONDITIONS | AM26S10 |     |     | AM26S11 |     |     | UNIT |
|-------------------------------------------------------------------|------|----|--------------------|---------|-----|-----|---------|-----|-----|------|
|                                                                   |      |    |                    | MIN     | TYP | MAX | MIN     | TYP | MAX |      |
| t <sub>PLH</sub> Propagation delay time, low-to-high-level output | D    | B  | See Figure 1       | 10      | 15  |     | 12      | 19  | ns  |      |
| t <sub>PHL</sub> Propagation delay time, high-to-low-level output |      |    |                    | 10      | 15  |     | 12      | 19  |     |      |
| t <sub>PLH</sub> Propagation delay time, low-to-high-level output | S    | B  |                    | 14      | 18  |     | 15      | 20  | ns  |      |
| t <sub>PHL</sub> Propagation delay time, high-to-low-level output |      |    |                    | 13      | 18  |     | 14      | 20  |     |      |
| t <sub>PLH</sub> Propagation delay time, low-to-high-level output | B    | R  |                    | 10      | 15  |     | 10      | 15  | ns  |      |
| t <sub>PHL</sub> Propagation delay time, high-to-low-level output |      |    |                    | 10      | 15  |     | 10      | 15  |     |      |
| t <sub>TLH</sub> Transition time, low-to-high-level output        |      | B  |                    | 4       | 10  |     | 4       | 10  | ns  |      |
| t <sub>THL</sub> Transition time, high-to-low-level output        |      |    |                    | 2       | 4   |     | 2       | 4   |     |      |

PARAMETER MEASUREMENT INFORMATION



VOLTAGE WAVEFORMS

- NOTES: A. The pulse generators have the following characteristics:  $Z_0 = 50 \Omega$ ,  $t_r = 10 \pm 5$  ns.  
 B. Includes probe and jig capacitance.  
 C. All diodes are 1N916 or equivalent.

FIGURE 1

APPLICATION INFORMATION

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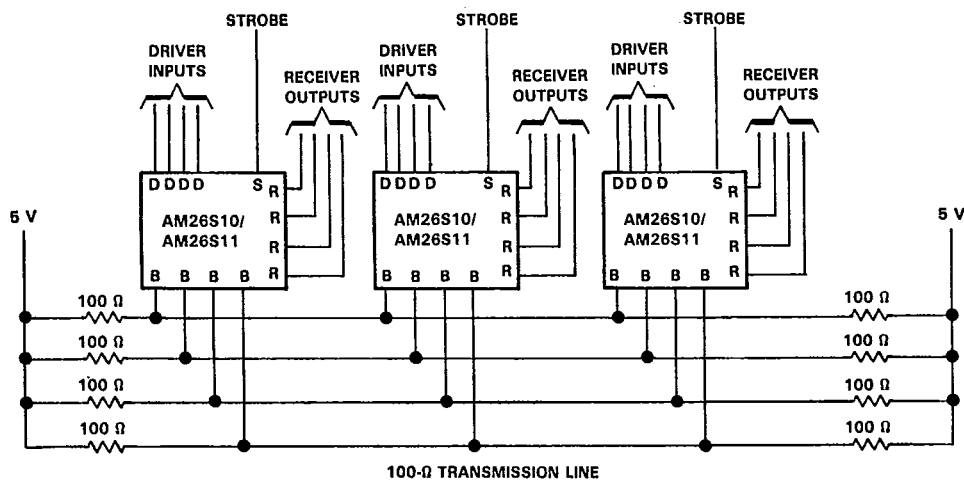


FIGURE 2. PARTY-LINE SYSTEM