AM26LS32B

Quad Differential Line Receiver

The AM26LS32B is a quad line receiver designed to meet the requirements of RS-422 and RS-423, CCITT V.10 and V.11, and Federal Standards 1020 and 1030 for balanced and unbalanced digital data transmission. The AM26LS32B features an input sensitivity of 200 mV over the common mode input voltage range of -7 V to +12 V.

The AM26LS32B is the first device in the AM26LS32 configuration to guarantee minimum hysteresis and propagation delay skew while maintaining better propagation delay guarantees than the AM26LS32. This allows a more critical analysis of performance in high noise environments and better performance in terms of signal quality, resulting in better system performance.

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-38535
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
    - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

Am26LS32B

Quad Differential Line Receiver

Advanced Micro Devices

DISTINCTIVE CHARACTERISTICS

- ±120 mV sensitivity over V_{IN} range of 0 V to 5 V
- ±200 mV sensitivity over V_{CM} range
- –7 V to +12 V input voltage range – differential or common mode
- Guaranteed input voltage hysteresis limits
  - 65 mV minimum
  - 240 mV maximum
- 3 V maximum open circuit input voltage
- Three-state outputs disabled during power-up and power-down
- Maximum guarantees for t_{PD} skew
- All AC and DC parameters guaranteed over COM'L and MIL operating temperature ranges
- Single +5 V supply
- Advanced low-power Schottky processing

GENERAL DESCRIPTION

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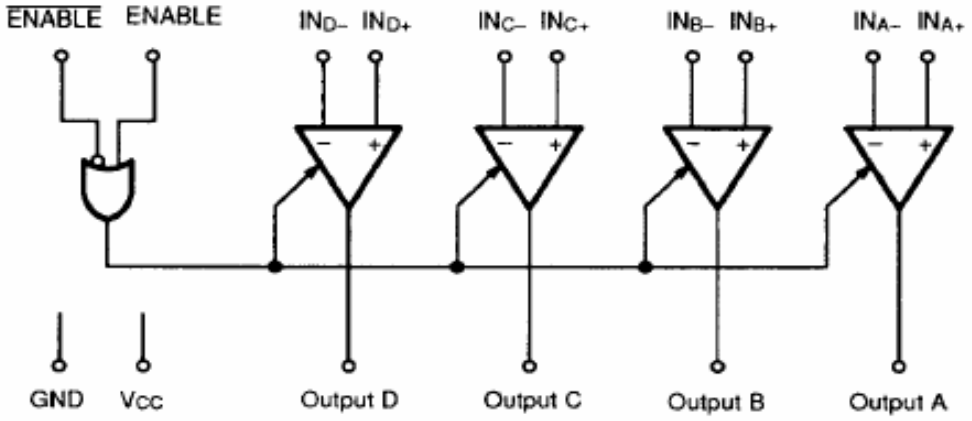
The Am26LS32B provides an enable and disable function common to all four receivers. It features three-state outputs with 24 mA sink capability and incorporates a fail safe input-output relationship which keeps the outputs high when the inputs are open.

The Am26LS32B is contructed using Advanced Low-Power Schottky processing.

BLOCK DIAGRAM



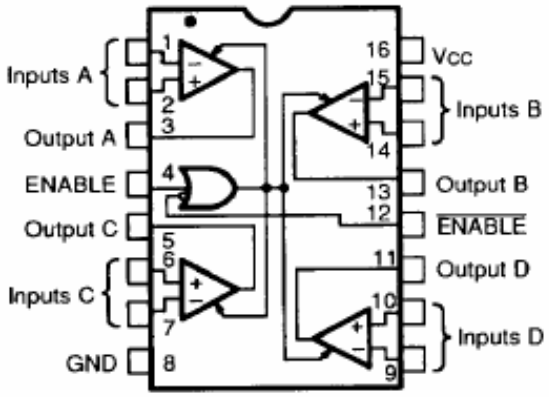
RELATED AMD PRODUCTS

Part No.	Description
26LS29	Quad Three-State Single Ended RS-423 Line Driver
26LS30	Dual Differential RS-422 Party Line/Quad Single Ended RS-423 Line Driver
26LS33	Quad Differential Line Receiver

Publication# 01024 Rev. B Amendment/0
Issue Date: May 1991

CONNECTION DIAGRAMS
Top View

DIP



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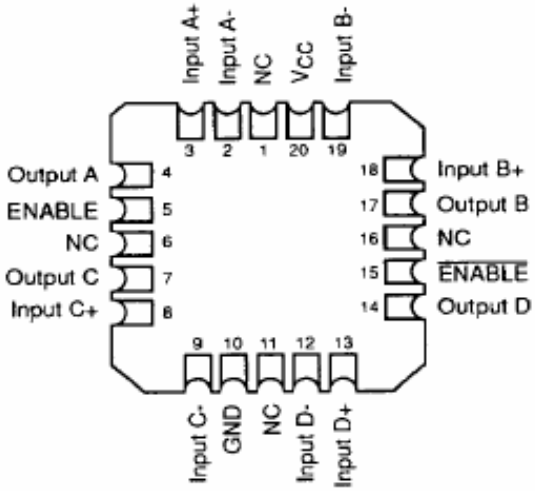
LCC



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Note:
Pin 1 is marked for orientation.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	7.0 V
Common Mode Range	±25 V
Differential Input Voltage	±25 V
Enable Voltage	7.0 V
Output Sink Current	50 mA
Storage Temperature Range	–65 to +165°C

Stresses above those listed under Absolute Maximum Ratings may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices

Temperature	0 to +70°C
Supply Voltage	+4.5 V to +5.5 V

Military (M) Devices

Temperature	–55 to +125°C
Supply Voltage	+4.5 V to +5.5 V

Operating ranges define those limits between which the functionality of the device is guaranteed.

DC CHARACTERISTICS over operating ranges unless otherwise specified

Parameter Symbol	Parameter Description	Test Conditions		Min.	Typ. (Note 1)	Max.	Unit
V_{TH}	Differential Input Voltage (Note 5)	$V_{OUT} = V_{OL}$ or V_{OH}	$0 \le V_{CM} \le +5$ V	–100	±60	100	mV
			-7 V $\le V_{CM} \le +12$ V	–200		200	
V_{HYST}	Input Hysteresis	V_{CC} = 5.0 V		65		240	mV
V_{IOC}	Open Circuit Input Voltage			1.5		3.0	V
R_{IN}	Input Resistance (Note 4)	-15 V $\le V_{CM} \le +15$ V (One input AC ground)		6.0	9.8		kΩ
I_{IN}	Input Current (Under Test)	V_{IN} = +15 V, Other Input -15 V $\le V_{IN} \le +15$ V				2.3	mA
I_{IN}	Input Current (Under Test)	V_{IN} = -15 V, Other Input -15 V $\le V_{IN} \le +15$ V				–2.8	mA
V_{OH}	Output HIGH Voltage	V_{CC} = Min., ΔV_{IN} = +1.0 V	I_{OH} = –12 mA	2.0			V
		$V_{\overline{ENABLE}}$ = 0.8 V	I_{OH} = –1 mA	2.4			
V_{OL}	Output LOW Voltage	V_{CC} = Min., ΔV_{IN} = –1.0 V	I_{OL} = 16 mA			0.4	V
		$V_{\overline{ENABLE}}$ = 0.8 V	I_{OL} = 24 mA			0.5	
V_{IL}	Enable LOW Voltage	(Note 2)				0.8	V
V_{IH}	Enable HIGH Voltage	(Note 2)		2.0			V
V_{IC}	Enable Clamp Voltage	V_{CC} = Min., I_{IN} = –18 mA				–1.5	V
I_O	Off-State (High Impedance) Output Current	V_{CC} = Max.	V_O = 2.4 V			50	µA
			V_O = 0.4 V			–50	
I_{IL}	Enable LOW Current	V_{IN} = 0.4 V, V_{CC} = Max.			–0.2	–0.36	mA
I_{IH}	Enable HIGH Current	V_{IN} = 2.7 V, V_{CC} = Max.				20	µA
I_I	Enable Input High Current	V_{IN} = 5.5 V, V_{CC} = Max.				100	µA
I_{SC}	Output Short Circuit Current	V_O = 0 V, V_{CC} = Max., ΔV_{IN} = +1.0 V (Note 3)		–30	–65	–120	mA
I_{CC}	Power Supply Current	V_{CC} = Max., All V_{IN} = GND, Outputs Disabled			52	70	mA

Notes:

1. All typical values are V_{CC} = 5.0 V, T_A = 25°C.
2. Input thresholds are tested during DC tests and may be done in combination with testing of other DC parameters.
3. Not more than one output should be shorted at a time. Duration of short circuit test should not exceed one second.
4. R_{IN} is not directly tested but is correlated. (See Attachment I)
5. Input voltage is not tested directly due to tester accuracy limitations but is tester correlated. (See Attachment II)

SWITCHING CHARACTERISTICS (T_A = +25°C, V_{CC} = 5.0 V)

Parameter Symbol	Parameter Description	Test Conditions	Min.	Typ.	Max.	Unit
t_{PLH}	Propagation Delay, Input to Output	C_L = 50 pF See test circuit		16	21	ns
t_{PHL}				17	21	ns
t_{SKEW}	Propagation Delay Skew, $t_{PLH} - t_{PHL}$			1.5	3.0	ns
t_{ZL}	Output Enable Time, ENABLE to Output			16	22	ns
t_{ZH}				10	16	ns
t_{LZ}	Output Disable Time, ENABLE to Output	C_L = 5 pF See test circuit		11	18	ns
t_{HZ}				13	18	ns

SWITCHING CHARACTERISTICS over operating ranges unless otherwise specified

Parameter Symbol	Parameter Description	Test Conditions	Commercial		Military		Unit
			Min.	Max.	Min.	Max.	
t_{PLH}	Propagation Delay, Input to Output	C_L = 50 pF See test circuit		26		26	ns
t_{PHL}				26		26	ns
t_{SKEW}	Propagation Delay Skew, $t_{PLH} - t_{PHL}$			4.0		4.0	ns
t_{ZL}	Output Enable Time, ENABLE to Output			33		33	ns
t_{ZH}				22		22	ns
t_{LZ}	Output Disable Time, ENABLE to Output	C_L = 5 pF See test circuit		27		27	ns
t_{HZ}				27		27	ns

Parameter Symbol	Parameter Description	Test Conditions	Min.	Typ.	Max.	Unit
Tristate Delays for $\overline{\text{ENABLE}}$ (T_A = +25°C)						
t_{PZH}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 50 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			26	ns
t_{PZL}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 50 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			33	ns
t_{PHZ}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 5 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			20	ns
t_{PLZ}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 5 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			20	ns
Tristate Delays for $\overline{\text{ENABLE}}$ (–55°C to +125°C)						
t_{PZH}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 50 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			39	ns
t_{PZL}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 50 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			49	ns
t_{PHZ}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 5 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			30	ns
t_{PLZ}	Propagation Delay From $\overline{\text{ENABLE}}$ to Output	C_L 5 pF, R_{L1} = 1 kΩ, R_{L2} = 280 Ω			30	ns

KEY TO SWITCHING WAVEFORMS

WAVEFORM	INPUTS	OUTPUTS
	Must Be Steady	Will Be Steady
	May Change from H to L	Will Be Changing from H to L
	May Change from L to H	Will Be Changing from L to H
	Don't Care, Any Change Permitted	Changing, State Unknown
	Does Not Apply	Center Line is High Impedance "Off" State

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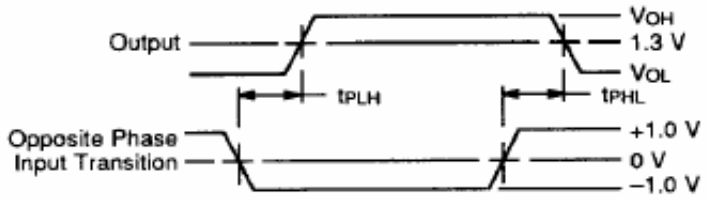
SWITCHING WAVEFORMS



Propagation Delay (Notes 1 and 3)

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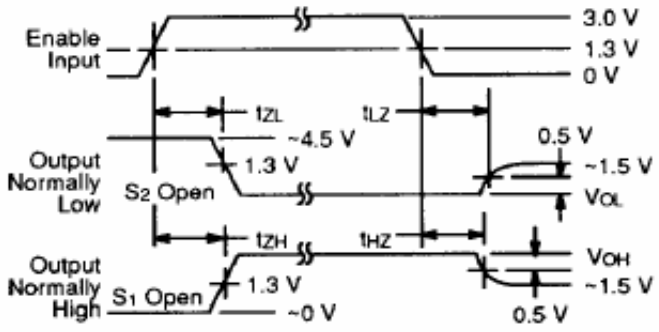

Enable and Disable Times (Notes 2 and 3)

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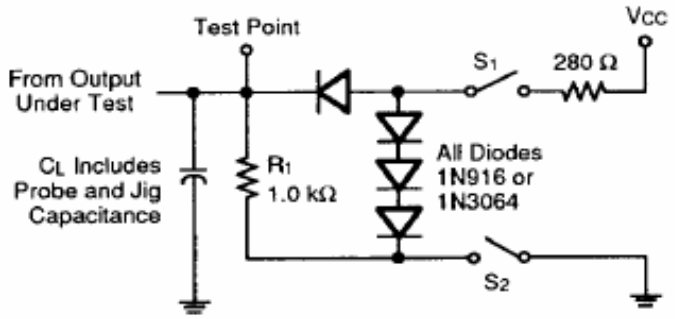
Notes:

1. Diagram shown for ENABLE LOW.
2. S_1 and S_2 of Load Circuit are closed except where shown.
3. Pulse Generator for All Pulses: Rate ≤ 1.0 MHz; Z_O = 50 Ω; t_r ≤ 2.5 ns; t_f ≤ 2.5 ns.

SWITCHING TEST CIRCUIT FOR THREE-STATE OUTPUTS



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