Am26LS31

Quad High Speed Differential Line Driver

DISTINCTIVE CHARACTERISTICS

- Output skew – 2.0ns typical
- Input to output delay – 12ns
- Operation from single +5V supply
- 16-pin hermetic and molded DIP package
- Outputs won't load line when $V_{CC} = 0$
- Four line drivers in one package for maximum package density
- Output short-circuit protection
- Complementary outputs
- Meets the requirements of EIA standard RS-422
- High output drive capability for 100Ω terminated transmission lines
- Available in military and commercial temperature range
- Advanced low-power Schottky processing
- 100% reliability assurance screening to MIL-STD-883 requirements

FUNCTIONAL DESCRIPTION

The Am26LS31 is a quad differential line driver, designed for digital data transmission over balanced lines. The Am26LS31 meets all the requirements of EIA standard RS-422 and federal standard 1020. Is is designed to provide unipolar differential drive to twisted-pair or parallel-wire transmission lines.

The circuit provides an enable and disable function common to all four drivers. The Am26LS31 features 3-state outputs and logical OR-ed complementary enable inputs. The inputs are all LS compatible and are all one unit load.

The Am26LS31 is constructed using advanced low-power Schottky processing.

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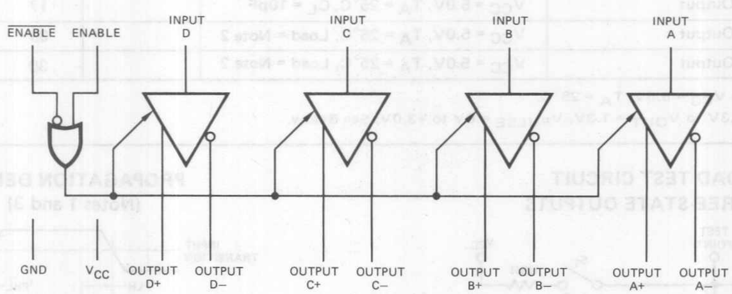
LOGIC DIAGRAM



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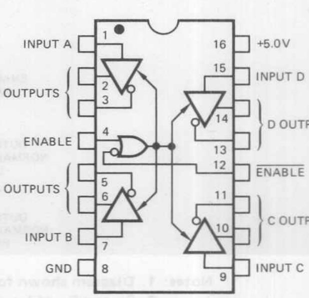
ORDERING INFORMATION

Package Type	Temperature Range	Order Number
Hermetic DIP	-55°C to +125°C	AM26LS31DM
Flat Pak	-55°C to +125°C	AM26LS31FM
Dice	-55°C to +125°C	AM26LS31XM
Hermetic DIP	0°C to +70°C	AM26LS31DC
Molded DIP	0°C to +70°C	AM26LS31PC
Dice	0°C to +70°C	AM26LS31XC

CONNECTION DIAGRAM
(Top View)



Note: Pin 1 is marked for orientation.

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	5.5V
Storage Temperature Range	−65°C to +150°C

ELECTRICAL CHARACTERISTICS over the operating temperature range

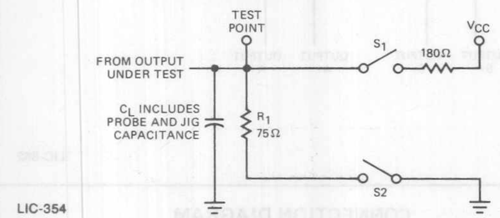
The following conditions apply unless otherwise specified:

Am26LS31XM (MIL) T_A = −55°C to +125°C V_{CC} = 5V ± 10%
Am26LS31XC (COM'L) T_A = 0°C to +70°C V_{CC} = 5V ± 5%

Parameters	Description	Test Conditions		Min.	Typ. (Note 1)	Max.	Units
V_{OH}	Output HIGH Voltage	V_{CC} = Min., I_{OH} = −20mA		2.5	3.2		Volts
V_{OL}	Output LOW Voltage	V_{CC} = Min., I_{OL} = 20mA			0.32	0.5	Volts
V_{IH}	Input HIGH Voltage	V_{CC} = Min.		2.0			Volts
V_{IL}	Input LOW Voltage	V_{CC} = Max.				0.8	Volts
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = 0.4V			−0.20	−0.36	mA
I_{IH}	Input HIGH Current	V_{CC} = Max., V_{IN} = 2.7V			0.5	20	μA
I_I	Input Reverse Current	V_{CC} = Max., V_{IN} = 7.0V			0.001	0.1	mA
I_O	Off-State (High Impedance) Output Current	V_{CC} = Max.	V_O = 5.5V		0.5	20	μA
			V_O = 0.5V		0.5	−20	
V_I	Input Clamp Voltage	V_{CC} = Min., I_{IN} = 18mA			−0.8	−1.5	Volts
I_{SC}	Output Short Circuit Current	V_{CC} = Max.		−30	−60	−150	mA
I_{CC}	Power Supply Current	V_{CC} = Max., all outputs disabled			60	80	mA
t_{PLH}	Input to Output	V_{CC} = 5.0V, T_A = 25°C, Load = Note 2			12	20	ns
t_{PHL}	Input to Output	V_{CC} = 5.0V, T_A = 25°C, Load = Note 2			12	20	ns
SKEW	Output to Output	V_{CC} = 5.0V, T_A = 25°C, Load = Note 2			2.0	6.0	ns
t_{LZ}	Enable to Output	V_{CC} = 5.0V, T_A = 25°C, C_L = 10pF			23	35	ns
t_{HZ}	Enable to Output	V_{CC} = 5.0V, T_A = 25°C, C_L = 10pF			17	30	ns
t_{ZL}	Enable to Output	V_{CC} = 5.0V, T_A = 25°C, Load = Note 2			35	45	ns
t_{ZH}	Enable to Output	V_{CC} = 5.0V, T_A = 25°C, Load = Note 2			30	40	ns

Notes: 1. All typical values are V_{CC} = 5.0V, T_A = 25°C.
2. C_L = 30pF, V_{IN} = 1.3V to V_{OUT} = 1.3V, V_{PULSE} = 0V to +3.0V, See Below.

AC LOAD TEST CIRCUIT FOR THREE-STATE OUTPUTS



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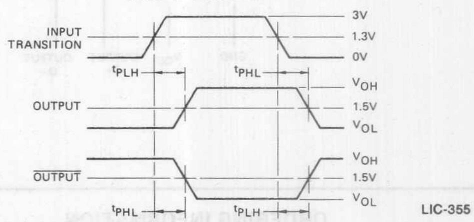
PROPAGATION DELAY
(Notes 1 and 3)



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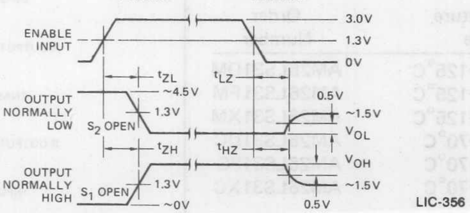
ENABLE AND DISABLE TIMES
(Notes 2 and 3)



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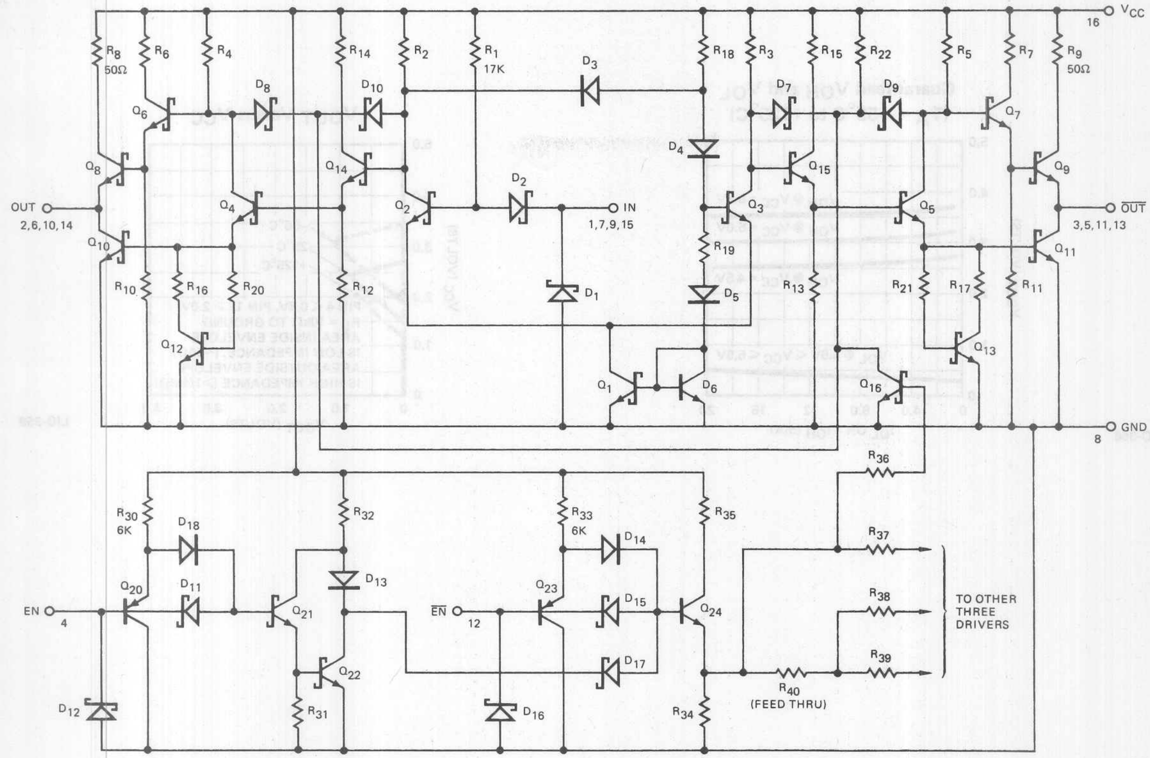
Notes: 1. Diagram shown for $\overline{\text{Enable}}$ LOW.
2. S_1 and S_2 of Load Circuit are closed except where shown.
3. Pulse Generator for All Pulses: Rate ⩽ 1.0MHz; Z_o = 50Ω; t_r ⩽ 15ns; t_f ⩽ 6.0ns.

EQUIVALENT CIRCUIT (1/4 Am26LS31)



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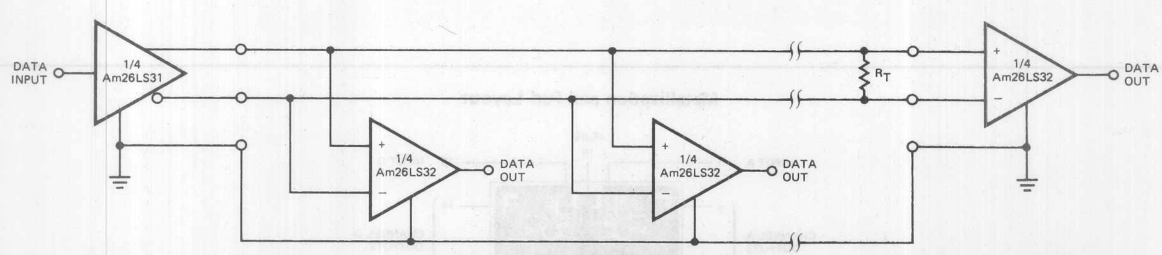
TYPICAL APPLICATION



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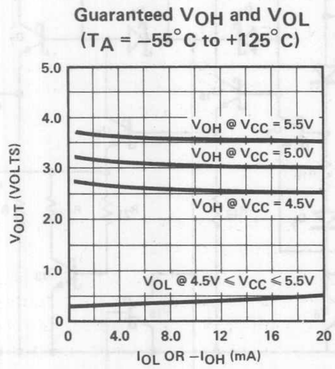

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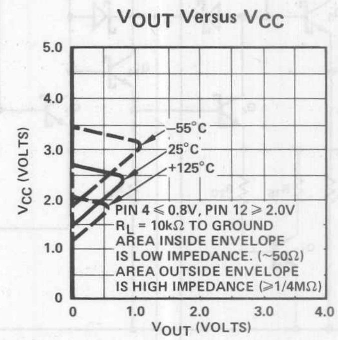

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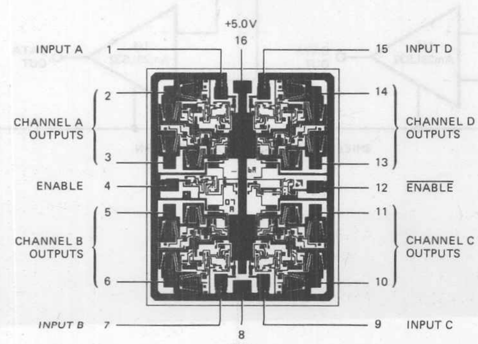
Metallization and Pad Layout



DIE SIZE 0.067" X 0.084"