Quad high-speed differential line driver — AM26LS31

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. It 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.

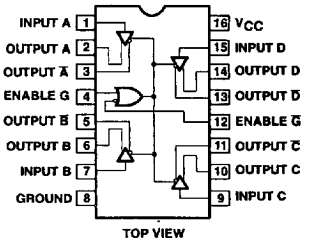
The AM26LS31 is constructed using advanced Low Power Schottky processing.

FEATURES

- Output skew of 2.0ns typical
- Input to output delay: 12ns
- Operation from single +5V
- 16-pin DIP and SO packages
- Four line drivers in one package
- Output short-circuit protection
- Complementary outputs
- Meets 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
- Outputs won't load line when V_{CC} = 0V

PIN CONFIGURATION

D, and N Packages



TOP VIEW

APPLICATIONS

- Data communications equipment
- Computer peripherals
- Workstations
- Automatic test equipment

FUNCTION TABLE (Each Driver)

INPUT	ENABLES		OUTPUTS	
A	G	$\overline{G}$	A	$\overline{A}$
H	H	X	H	L
L	H	X	L	H
H	X	L	H	L
L	X	L	L	H
X	L	H	Z	Z

NOTES:
H = High level
L = Low level
X = Irrelevant
Z = High-impedance (OFF)

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
16-Pin Plastic Dual In-Line Package (DIP)	0°C to +70°C	AM26LS31CN	0406C
16-Pin Small Outline (SO) Package	0°C to +70°C	AM26LS31CD	0005D
16-Pin Plastic Dual In-Line Package (DIP)	–40°C to +85°C	AM26LS31IN	0406C
16-Pin Small Outline (SO) Package	–40°C to +85°C	AM26LS31ID	0005D
16-Pin Plastic Dual In-Line Package (DIP)	–55°C to +125°C	AM26LS31MN	0406C

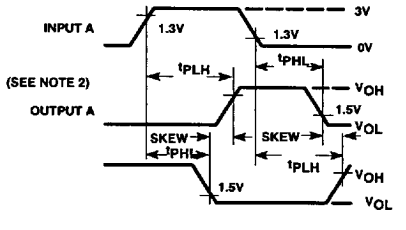
DC AND AC ELECTRICAL CHARACTERISTICS

V_{CC} = 5V ±10%, T_A = −55 to +125°C for AM26LS31MN; V_{CC} = 5V ±5%, T_A = −40 to +85°C for AM26LS31IN and AM26LS31ID; V_{CC} = 5V ±5%, T_A = 0 to +70°C for AM26LS31CN and AM26LS31CD, unless otherwise specified.

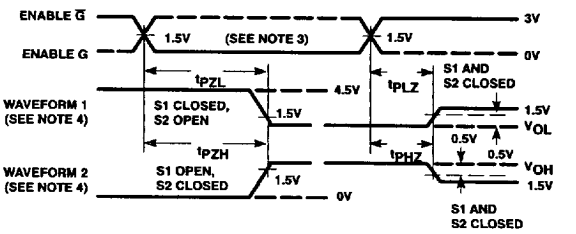
SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ[1]	Max	
V_{OH}	Output High voltage	V_{CC} = Min., I_{OH} = −20mA	2.5	3.0		V
V_{OL}	Output Low voltage	V_{CC} = Min., I_{OL} = 20mA		0.3	0.5	V
V_{IH}	Input High voltage	V_{CC} = Min.	2.0			V
V_{IL}	Input Low voltage	V_{CC} = Max.			0.8	V
I_{IL}	Input Low current	V_{CC} = Max., V_{IN} = 0.4V		−0.26	−0.36	mA
I_{IH}	Input High current	V_{CC} = Max., V_{IN} = 2.7V		0.001	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 V_O = 0.5V		0.6 −0.050	20 −20	µA µA
V_I	Input clamp voltage	V_{CC} = Min., I_{IN} = −18mA		−0.8	−1.5	V
I_{SC}	Output short-circuit current	V_{CC} = Max.	−30		−150	mA
I_{CC}	Power supply current	V_{CC} = Max; all outputs disabled		40	80	mA
t_{PLH}	Input to output	T_A = 25°C, load[2]		9	20	ns
t_{PHL}	Input to output	T_A = 25°C, load[2]		9	20	ns
SKEW	Output to output	T_A = 25°C, load[2]		2	6	ns
t_{LZ}	Enable to output	T_A = 25°C, C_L = 10pF		17	35	ns
t_{HZ}	Enable to output	T_A = 25°C, C_L = 10pF		12	30	ns
t_{ZL}	Enable to output	T_A = 25°C, load[2]		14	45	ns
t_{ZH}	Enable to output	T_A = 25°C, load[2]		12	40	ns

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

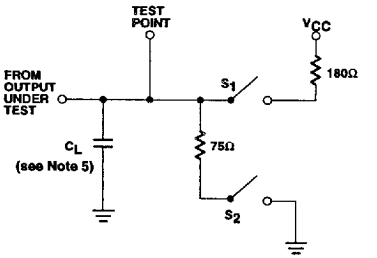
TIMING DIAGRAMS



Propagation Delay Times and Skew



Enable and Disable Times

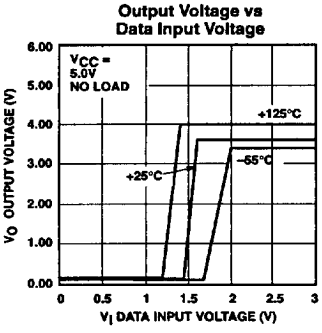


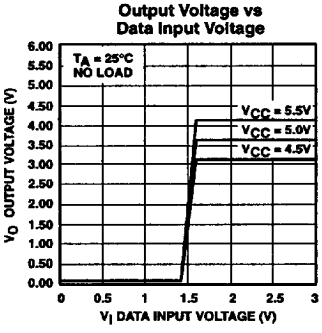
Test Circuit

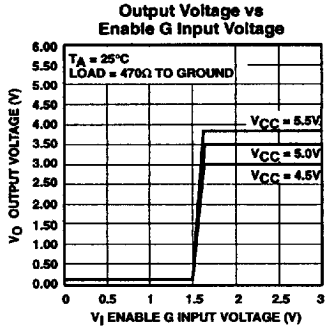
NOTES:

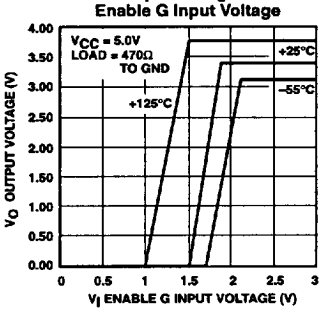
1. All pauses are supplied by generators having the following characteristics PRR ≤ 1MHz, Z_{OUT} = 50W, 1R ≤ 15ns, 1F ≤ 6ns
2. When measuring propagation delay times and skew, switches S1 and S2 are open.
3. Each enable is tested separately.
4. Waveform 1 is for an output with internal condition such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal condition such that the output is high except when disabled by the output control.
5. C_L includes probe and jig coapacitance

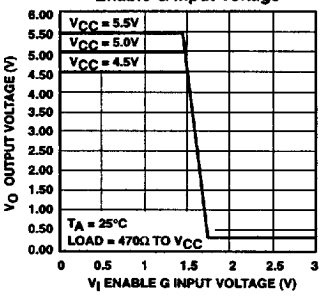
TYPICAL PERFORMANCE CHARACTERISTICS

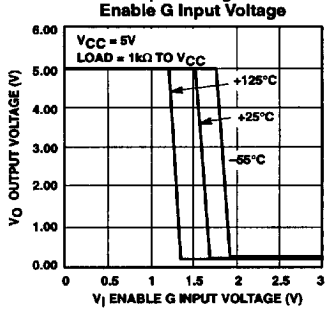


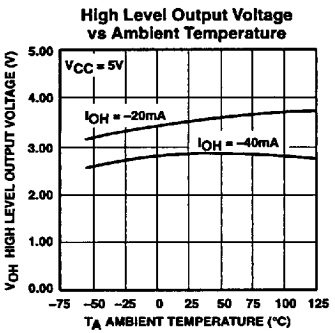


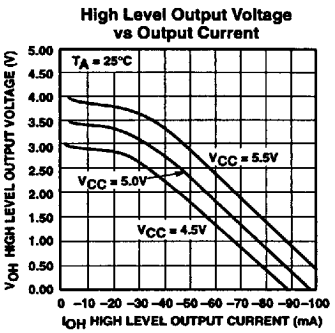


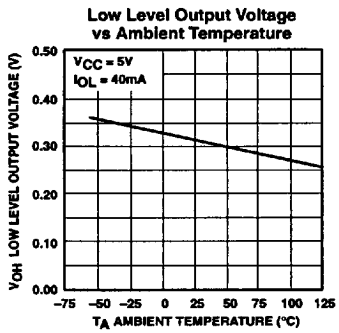












TYPICAL PERFORMANCE CHARACTERISTICS (Continued)