

DS26LV31QML

3V Enhanced CMOS Quad Differential Line Driver

General Description

The DS26LV31 is a high-speed quad differential CMOS driver that is comparable to the TIA/EIA-422-B and ITU-T V.11 standards. The CMOS DS26LV31 features low static I_{CC} of 125 μ A Max which makes it ideal for battery powered and power conscious applications. Differential outputs have the same V_{OD} guarantee ($\geq 2V$) as the 5V version. The EN and $\overline{EN}$ inputs allow active Low or active High control of the TRI-STATE outputs. The enables are common to all four drivers. Protection diodes protect all the driver inputs against electrostatic discharge. The driver and enable inputs (DI, EN, $\overline{EN}$) are compatible with low voltage LVTTTL and LVC-MOS devices.

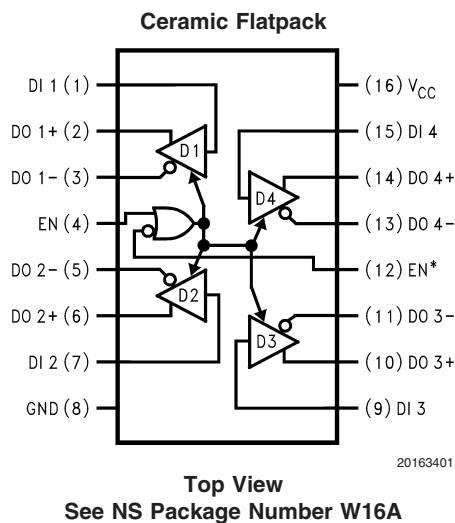
Features

- Comparable to both TIA/EIA-422 and ITU-T V.11 standards.
- Interoperable with existing 5V RS-422 networks
- Low quiescent current
- Pin compatible with DS26C31

Ordering Information

NS Part Number	SMD Part Number	NS Package Number	Package Description
DS26LV31W-QML	5962-9858401QFA	W16A	16 Lead Ceramic Flatpack

Connection Diagram



Absolute Maximum Ratings (Notes 1, 2)

Supply Voltage (V_{CC})	-0.5V to 7.0V
DC Input Voltage (V_I)	-0.5V to $V_{CC}+0.5V$
DC Output Voltage (V_O) Power off	-0.5V to 7V
Clamp Diode Current (I_{IK} , I_{OK})	$\pm 20mA$
DC Output Current, per Pin (I_O)	$\pm 150mA$
Storage Temperature Range (T_{Stg})	$-65^{\circ}C \leq T_A \leq +150^{\circ}C$
Lead Temperature (T_L) Soldering, 4 seconds	$260^{\circ}C$
Maximum Power Dissipation $+25^{\circ}C$ (Note 3)	1119mW
Thermal Resistance	
θ_{JA}	$134^{\circ}C/W$
θ_{JC}	$12.5^{\circ}C/W$

Recommended Operating Conditions

Supply Voltage (V_{CC})	3.0V to 3.6V
DC input or Output Voltage (V_I , V_O)	0V to V_{CC}
Operating Temperature Range (T_A)	$-55^{\circ}C \leq T_A \leq +125^{\circ}C$

Quality Conformance Inspection

Mil-Std-883, Method 5005 - Group A

Subgroup	Description	Temp $^{\circ}C$
1	Static tests at	25
2	Static tests at	125
3	Static tests at	-55
4	Dynamic tests at	25
5	Dynamic tests at	125
6	Dynamic tests at	-55
7	Functional tests at	25
8A	Functional tests at	125
8B	Functional tests at	-55
9	Switching tests at	25
10	Switching tests at	125
11	Switching tests at	-55
12	Settling time at	25
13	Settling time at	125
14	Settling time at	-55

DS26LV31M Electrical Characteristics

DC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
V_{IH}	Logical "1" Input Voltage		(Note 6)	2.0		V	1, 2, 3
V_{IL}	Logical "0" Input Voltage		(Note 6)		0.8	V	1, 2, 3
V_{OD1}	Differential Output Voltage	$R_L = \text{No Load}, V_{CC} = 3.0/3.6V$	(Note 4)		4.0	V	1, 2, 3
V_{OD2}	Differential Output Voltage	$R_L = 100\Omega, V_{CC} = 3.0/3.6V$	(Note 4)	2.0		V	1, 2, 3
$V_{OD2} - \overline{V_{OD2}}$	Difference in Differential Output	$R_L = 100\Omega, V_{CC} = 3.0/3.6V$	(Note 4)	-0.4	0.4	V	1, 2, 3
V_{OD3}	Differential Output Voltage	$R_L = 3900\Omega, V_{CC} = 3.0/3.6V$	(Note 4)		3.6	V	1, 2, 3
V_{OC}	Common Mode Output Voltage	$R_L = 100\Omega, V_{CC} = 3.0/3.6V$	(Note 4)		2.0	V	1, 2, 3
$V_{OC} - \overline{V_{OC}}$	Difference in Common Mode Output	$R_L = 100\Omega, V_{CC} = 3.0/3.6V$	(Note 4)	-0.4	0.4	V	1, 2, 3
I_{IL}	Low Level Input Current	$V_I = \text{Gnd}, V_{CC} = 3.6V$		-10		μA	1, 2, 3
I_{IH}	High Level Input Current	$V_I = V_{CC}, V_{CC} = 3.6V$			10	μA	1, 2, 3
V_{CL}	Input Clamp Voltage	$I_I = -18mA, V_{CC} = 3.0V$			-1.5	V	1, 2, 3
I_{CC}	Quiescent Power Supply Current	$I_O = 0\mu A, V_I = V_{CC} \text{ or Gnd}, V_{CC} = 3.6V$			125	μA	1, 2, 3
I_{OZ}	TRI-STATE Output Leakage Current	$V_O = V_{CC} \text{ or Gnd}, \text{Enable} = \overline{V_{IL}}, V_{CC} = 3.6V, \overline{\text{Enable}} = V_{IH}$			± 20	μA	1, 2, 3
I_{SC}	Output Short Circuit Current	$V_I = V_{CC} \text{ or Gnd}, V_{CC} = 3.0/3.6V, V_O = 0.0V$	(Note 4), (Note 5)	-30	-160	mA	1, 2, 3
I_{Off}	Output Leakage Current "Power Off"	$V_{CC} = 0V, V_O = 6.0V \text{ or } 3.0V$			100	μA	1, 2, 3
		$V_{CC} = 0V, V_O = -0.25V$			-200	μA	1, 2, 3

AC Parameters - Propagation Delay Time

The following conditions apply to all the following parameters, unless otherwise specified. AC: $V_{CC} = 3.0/3.6V$

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
t_{PLHD}	Differential Propagation Delay (Low to High)	$R_L = 100\Omega, C_L = 50pF$	(Note 7)	5.0	25	nS	9, 10, 11
t_{PHLD}	Differential Propagation Delay (High to Low)	$R_L = 100\Omega, C_L = 50pF$	(Note 7)	5.0	25	nS	9, 10, 11
t_{SKD}	Differential Skew $t_{PHLD} - t_{PLHD}$ (same channel)	$R_L = 100\Omega, C_L = 50pF$	(Note 7)		5.0	nS	9, 10, 11
t_{SK1}	Pin to Pin Skew (same device)	$R_L = 100\Omega, C_L = 50pF$	(Note 7)		5.0	nS	9, 10, 11
t_{PZH}	Output Enable Time	$R_L = 110\Omega \text{ to Gnd}, C_L = 50pF$	(Note 8)		40	nS	9, 10, 11
t_{PZL}	Output Enable Time	$R_L = 110\Omega \text{ to } V_{CC}, C_L = 50pF$	(Note 8)		40	nS	9, 10, 11
t_{PHZ}	Output Disable Time	$R_L = 110\Omega \text{ to Gnd}, C_L = 50pF$	(Note 8)		35	nS	9, 10, 11
t_{PLZ}	Output Disable Time	$R_L = 110\Omega \text{ to } V_{CC}, C_L = 50pF$	(Note 8)		35	nS	9, 10, 11

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed. Some performance characteristics may degrade when the device is not operated under the listed test conditions.

Note 2: Unless otherwise specified, all voltages are referenced to ground. All currents into device pins are positive, all currents out of device pins are negative.

Note 3: Derate W package 7.5mW/°C above +25°C.

Note 4: See EIA specification RS-422 for exact test condition.

Note 5: This is a current sourced when a high output is shorted to Gnd. Only one output at a time should be shorted.

Note 6: Parameter tested Go-No-Go only.

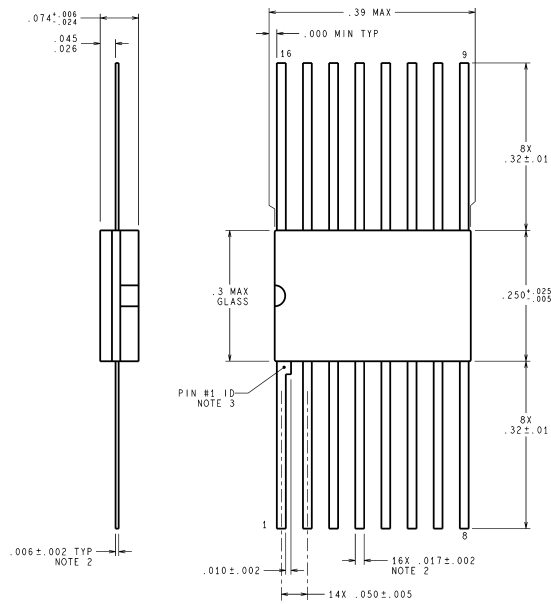
Note 7: Generator waveform is specified as follows: $f = 1MHz$, Duty Cycle = 50%, $Z_O = 50\Omega$, $t_R = t_F \leq 6nS$. Driver input = 0V to 3V with measure points equal to 1.5V. Differential output $V_{Diff} = D_O - \overline{D_O}$ with measure point equal to 0V.

Note 8: Generator waveform is specified as follows: $f = 1MHz$, Duty Cycle = 50%, $Z_O = 50\Omega$, $t_R = t_F \leq 6nS$. $\text{En}/\overline{\text{En}}$ inputs = 0V to 3V with measure points equal to 1.5V on the inputs, to 1.3V on the outputs for Z_L and Z_H , and $(V_{OL} + 0.3V)$ for Z_L , and $(V_{OH} - 0.3V)$ for Z_H .

Revision History

Released	Revision	Section	Originator	Changes
03/01/06	A	New Release, Corporate format	L. Lytle	1 MDS data sheets converted into one Corp. data sheet format. MNDS26LV31-X Rev 1A0 will be archived.

Physical Dimensions inches (millimeters) unless otherwise noted



DIMENSIONS ARE IN INCHES

W16A (Rev T)

Cerpack Package (W)
NS Package Number W16A

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