DS90LV017 LVDS Single High-Speed Differential Driver

Check for Samples: DS90LV017

FEATURES

- **Ultra Low Power Dissipation**
- **Operating Range Above 155 Mbps**
- **Flow-through Pinout Simplifies PCB Layout**
- **Conforms to TIA/EIA-644 Standard**
- **8-Lead SOIC Package Saves Space**
- **V_{CM} ±1V Center Around 1.2V**
- **Low Differential Output Swing Typical 340 mV**
- **Power-Off Protection (Outputs in High Impedance)**

DESCRIPTION

The DS90LV017 is a single LVDS driver device optimized for high-data-rate and low-power applications. The DS90LV017 is a current mode driver allowing power dissipation to remain low even at high frequency. In addition, the short circuit fault current is also minimized. The device is in a 8-lead SOIC package. The DS90LV017 has a flow-through design for easy PCB layout. The differential driver outputs provides low EMI with its low output swings typically 340 mV.

CONNECTION DIAGRAM

Dual-In-Line

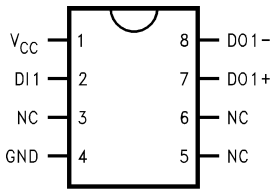

Figure 1. 8-Lead SOIC (D Package)

FUNCTIONAL DIAGRAM

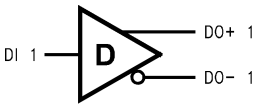

Figure 2.

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

ABSOLUTE MAXIMUM RATINGS(1)(2)

Supply Voltage (V_{CC})	−0.3V to +6V
Input Voltage (DI)	−0.3V to (V_{CC} + 0.3V)
Output Voltage (DO±)	−0.3V to +3.9V
Maximum Package Power Dissipation @ +25°C	
D Package	1190 mW
Derate D Package	9.5 mW/°C above +25°C
Storage Temperature Range	−65°C to +150°C
Lead Temperature Range	
Soldering (4 sec.)	+260°C
ESD Rating(3)	
(HBM 1.5 kΩ, 100 pF)	≥ 4.5 kV

(1) "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be ensured. They are not meant to imply that the devices should be operated at these limits. ELECTRICAL CHARACTERISTICS specifies conditions of device operation.
(2) If Military/Aerospace specified devices are required, please contact the Texas Instruments Sales Office/Distributors for availability and specifications.
(3) ESD Rating: HBM (1.5 kΩ, 100 pF) ≥ 4.5 kV

RECOMMENDED OPERATING CONDITIONS

	Min	Typ	Max	Units
Supply Voltage (V_{CC})	3.0	3.3	3.6	V
Temperature (T_A)	0	25	70	°C

ELECTRICAL CHARACTERISTICS(1)(2)(3)

Over Supply Voltage and Operating Temperature ranges, unless otherwise specified.

Symbol	Parameter	Conditions		Pin	Min	Typ	Max	Units
DIFFERENTIAL DRIVER CHARACTERISTICS								
V_{OD}	Output Differential Voltage	R_L = 100Ω (Figure 3)		DO+, DO−	250	340	450	mV
ΔV_{OD}	V_{OD} Magnitude Change				0	10	35	mV
V_{OH}	Output High Voltage					1.43	1.6	V
V_{OL}	Output Low Voltage				0.9	1.09		V
V_{OS}	Offset Voltage				0.9	1.25	1.6	V
ΔV_{OS}	Offset Magnitude Change				0	5	25	mV
I_{OZD}	TRI-STATE Leakage	V_{OUT} = V_{CC} or GND			0	±1	±10	µA
I_{OXD}	Power-off Leakage	V_{OUT} = 3.6V or GND, V_{CC} = 0V			0	±1	±10	µA
I_{OSD}	Output Short Circuit Current					−4	−6	mA
V_{IH}	Input High Voltage			DI	2.0		V_{CC}	V
V_{IL}	Input Low Voltage				GND		0.8	V
I_{IH}	Input High Current	V_{IN} = 3.6V or 2.4V				±1	±10	µA
I_{IL}	Input Low Current	V_{IN} = GND or 0.5V				±1	±10	µA
V_{CL}	Input Clamp Voltage	I_{CL} = −18 mA			−1.5	−0.8		V
I_{CC}	Power Supply Current	No Load	V_{IN} = V_{CC} or GND	V_{CC}		1	4	mA
		R_L = 100Ω				4.5	7	mA

(1) Current into device pins is defined as positive. Current out of device pins is defined as negative. All voltages are referenced to ground except V_{OD}.
(2) All typicals are given for: V_{CC} = +3.3V and T_A = +25°C.
(3) The DS90LV017 is a current mode device and only function with datasheet specification when a resistive load is applied to the drivers outputs.

SWITCHING CHARACTERISTICS(1)(2)

Over Supply Voltage and Operating Temperature Ranges, unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
DIFFERENTIAL DRIVER CHARACTERISTICS						
t_{PHLD}	Differential Propagation Delay High to Low	R_L = 100Ω, C_L = 5 pF (Figure 4 and Figure 5)	1.5	3.4	6	ns
t_{PLHD}	Differential Propagation Delay Low to High		1.5	3.5	6	ns
t_{SKD}	Differential Skew $\|t_{PHLD} - t_{PLHD}\|$		0	0.1	1.9	ns
t_{TLH}	Transition Low to High Time		0	1	3	ns
t_{THL}	Transition High to Low Time		0	1	3	ns

(1) C_L includes probe and fixture capacitance.
(2) Generator waveform for all tests unless otherwise specified: f = 1 MHz, Z_O = 50Ω, t_r ≤ 6 ns, t_f ≤ 6 ns (10%-90%).

PARAMETER MEASUREMENT INFORMATION

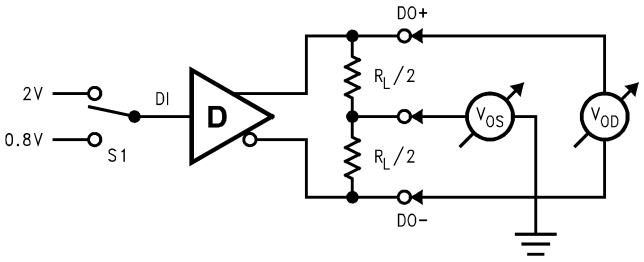

Figure 3. Differential Driver DC Test Circuit

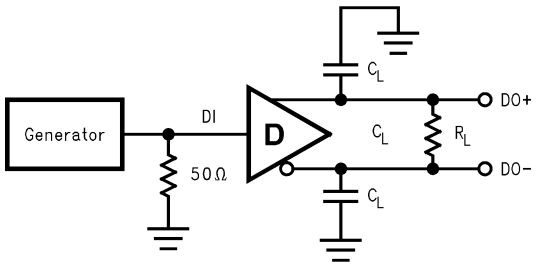

Figure 4. Differential Driver Propagation Delay and Transition Time Test Circuit

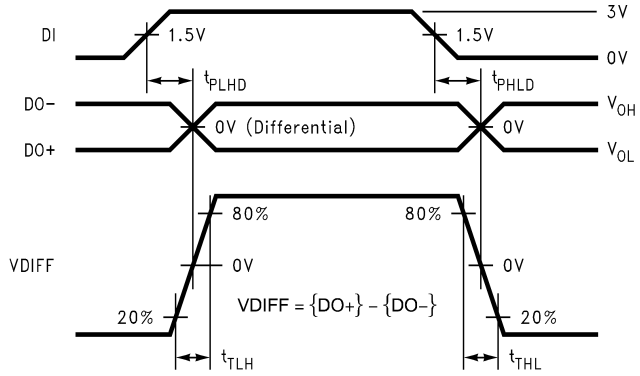

Figure 5. Differential Driver Propagation Delay and Transition Time Waveforms

APPLICATION INFORMATION

Table 1. Truth Table(1)

Input/Output		
DI	**DO+**	**DO−**
L	L	H
H	H	L
DI > 0.8V and DI < 2.0V	X	X

(1) H = Logic high level
L = Logic low level
X = indeterminant

Table 2. PIN DESCRIPTIONS

Pin #	Name	Description
2	DI	TTL/CMOS driver input pins
7	DO+	Non-inverting driver output pin
8	DO−	Inverting driver output pin
4	GND	Ground pin
1	V_{CC}	Positive power supply pin, +3.3V ± 0.3V
3, 5, 6	NC	No connect

REVISION HISTORY

Changes from Revision B (April 2013) to Revision C	Page
• Changed layout of National Data Sheet to TI format	4

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