August 2005



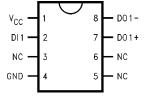
DS90LV017 LVDS Single High Speed Differential Driver General Description Features

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 small Outline 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.

- 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)

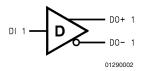
Connection Diagram





Order Number DS90LV017M See NS Package Number M08A

Functional Diagram



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Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

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 Diss	ipation @ +25°C
M Package	1190 mW
Derate M 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 (Note 4)	
(HBM 1.5 kΩ, 100 pF)	≥ 4.5 kV

Recommended Operating Conditions

	Min	Тур	Max	Units
Supply Voltage (V _{CC})	3.0	3.3	3.6	V
Temperature (T _A)	0	25	70	°C

Electrical Characteristics

Over Supply Voltage and Operating Temperature ranges, unless otherwise specified. (Notes 2, 3, 7)

Symbol	Parameter	Conditions		Pin	Min	Тур	Max	Units
DIFFERENTIAL DRIVER CHARACTERISTICS								
V _{OD}	Output Differential Voltage	$R_{L} = 100\Omega$ (Fig	gure 1)	DO+,	250	340	450	mV
ΔV_{OD}	V _{OD} Magnitude Change]		DO-	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	1			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	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				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		7	-1.5	-0.8		V
I _{CC}	Power Supply Current	No Load	$V_{IN} = V_{CC}$ or GND	V _{CC}		1	4	mA
		$R_L = 100\Omega$				4.5	7	mA

Switching Characteristics

Over Supply Voltage and Operating Temperature Ranges, unless otherwise specified. (Notes 5, 6)

Symbol	Parameter	Conditions	Min	Тур	Мах	Units
DIFFEREN	DIFFERENTIAL DRIVER CHARACTERISTICS					
t _{PHLD}	Differential Propagation Delay High to Low	$R_{L} = 100\Omega, C_{L} = 5 \text{ pF}$	1.5	3.4	6	ns
t _{PLHD}	Differential Propagation Delay Low to High	(<i>Figure 2</i> and <i>Figure 3</i>)	1.5	3.5	6	ns
t _{skD}	_{SKD} Differential Skew It _{PHLD} – t _{PLHD} I		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

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" specifies conditions of device operation.

Note 2: 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}.

Note 3: All typicals are given for: V_{CC} = +3.3V and T_A = +25 $^\circ C.$

Note 4: ESD Rating: HBM (1.5 k Ω , 100 pF) \geq 4.5 kV

Note 5: C_L includes probe and fixture capacitance.

Note 6: Generator waveform for all tests unless otherwise specified: f = 1 MHz, $Z_O = 50\Omega$, $t_r \le 6$ ns, $t_f \le 6$ ns (10%-90%).

Note 7: The DS90LV017 is a current mode device and only function with datasheet specification when a resistive load is applied to the drivers outputs.

Parameter Measurement Information

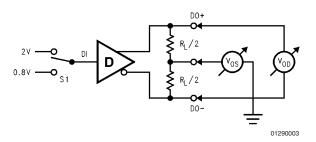


FIGURE 1. Differential Driver DC Test Circuit

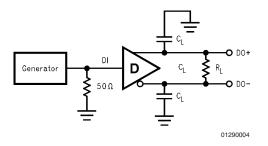
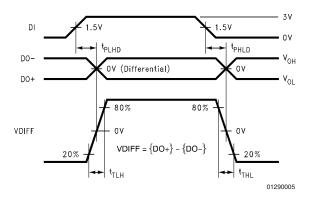


FIGURE 2. Differential Driver Propagation Delay and Transition Time Test Circuit





Application Information

Truth Table

Input/Output			
DI DO+ DO-			
L	L	Н	
Н	н	L	
DI > 0.8V and DI < 2.0V X X			

H = Lc

ogic	high lev	el
oaic	low leve	1

L = Logic low level X = indeterminant

TABLE	1.	Device	Pin	Descriptions
		000100		Decomptionio

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,	
		$+3.3V \pm 0.3V$	
3, 5, 6	NC	No connect	

