



T-75-45-07

DS75128/DS75129

DS75128/DS75129 Eight-Channel Line Receivers

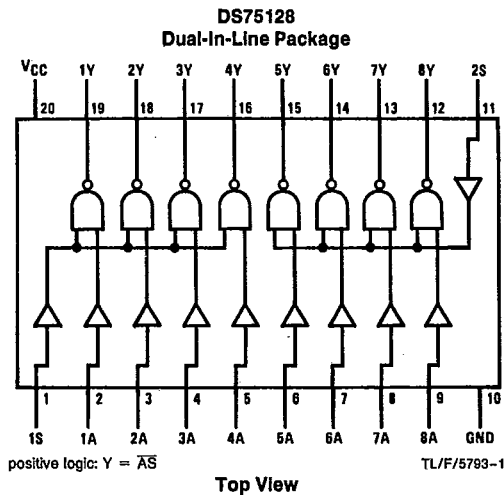
General Description

The DS75128 and DS75129 are eight-channel line receivers designed to satisfy the requirements of the input-output interface specification for IBM 360/370. Both devices feature common strobes for each group of four receivers. The DS75128 has an active-high strobe; the DS75129 has an active-low strobe. Special low-power design and Schottky-diode-clamped transistors allow low supply-current requirements while maintaining fast switching speeds and high-current TTL outputs. The DS75128 and DS75129 are characterized for operation from 0°C to 70°C.

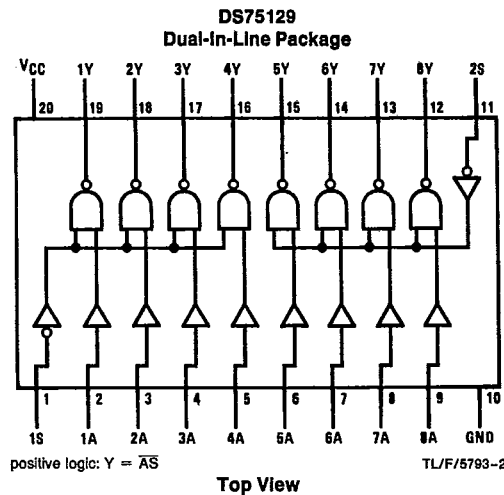
Features

- Meets IBM 360/370 I/O specification
- Input resistance—7 kΩ to 20 kΩ
- Output compatible with TTL
- Schottky-clamped transistors
- Operates from a single 5V supply
- High speed—low propagation delay
- Ratio specification— t_{PLH}/t_{PLH}
- Common strobe for each group of four receivers
- DS75128 strobe—active-high
DS75129 strobe—active-low

Connection Diagrams



Order Number DS75128J or DS75128N
See NS Package Number J20A or N20A



Order Number DS75129J or DS75129N
See NS Package Number J20A or N20A

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Absolute Maximum Ratings (Note 1)

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

Supply Voltage, V_{CC}	7V
Input Voltage Range	-0.15V to 7V
Strobe Input Voltage	7V
Maximum Power Dissipation* at 25°C (Note 2)	
Cavity Package	1564 mW
Molded Package	1687 mW
Operating Free-Air Temperature Range	0°C to +70°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature	300°C
$\frac{1}{16}$ Inch from Case for 60 Seconds: J Package	

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Lead Temperature 260°C
 $\frac{1}{16}$ Inch from Case for 4 Seconds: N Package
 *Derate cavity package 10.4 mW/°C above 25°C; derate molded package 13.5 mW/°C above 25°C.

Recommended Operating Conditions

	Min	Typ	Max	Units
Supply Voltage, V_{CC}	4.5	5.0	5.5	V
High-Level Output Current, I_{OH}			-0.4	mA
Low-Level Output Current, I_{OL}			16	mA
Operating Free-Air Temperature, T_A	0		70	°C

Electrical Characteristics over recommended operating free-air temperature range (Note 3)

Symbol	Parameter	Conditions	Min	Typ (Note 5)	Max	Units
V_{IH}	High-Level Input Voltage	A	1.7			V
		S	2			
V_{IL}	Low-Level Input Voltage	A			0.7	V
		S			0.7	
V_{OH}	High-Level Output Voltage	$V_{CC} = 4.5V, V_{IL} = 0.7V, I_{OH} = 0.4 mA$	2.4	3.1		V
V_{OL}	Low-Level Output Voltage	$V_{CC} = 4.5V, V_{IH} = 1.7V, I_{OL} = 16 mA$		0.4	0.5	V
V_I	Input Clamp Voltage	S $V_{CC} = 4.5V, I_I = -18 mA$			-1.5	V
I_{IH}	High-Level Input Current	A $V_{CC} = 5.5V, V_I = 3.11V$		0.3	0.42	mA
		S $V_{CC} = 5.5V, V_I = 2.7V$			20	μA
I_{IL}	Low-Level Input Current	A $V_{CC} = 5.5V, V_I = 0.15V$			-0.24	mA
		S $V_{CC} = 5.5V, V_I = 0.4V$			-0.4	
I_{OS}	Short-Circuit Output Current (Note 4)	$V_{CC} = 5.5V, V_O = 0V$	-18		-60	mA
r_I	Input Resistance	$V_{CC} = 4.5V, 0V, \text{ or Open}, \Delta V_I = 0.15V \text{ to } 4.15V$	7		20	k Ω
I_{CC}	Supply Current	DS75128 $V_{CC} = 5.5V, \text{ Strobe at } 2.4V, \text{ All A Inputs at } 0.7V$		19	31	mA
		DS75129 $V_{CC} = 5.5V, \text{ Strobe at } 0.4V, \text{ All A Inputs at } 0.7V$		19	31	
		DS75128 $V_{CC} = 5.5V, \text{ Strobe at } 2.4V, \text{ All A Inputs at } 4V$		32	53	
		DS75129 $V_{CC} = 5.5V, \text{ Strobe at } 0.4V, \text{ All A Inputs at } 4V$		32	53	

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

Note 2: For operation above 25°C free-air temperature, refer to Thermal Ratings for ICs, in App Note AN-336.

Note 3: All currents into device pins shown as positive, out of device pins as negative, all voltages referenced to ground unless otherwise noted. All values shown as max or min on absolute value basis.

Note 4: Only one output should be shorted at a time.

Note 5: All typical values are at $V_{CC} = 5V, T_A = 25^\circ C$.

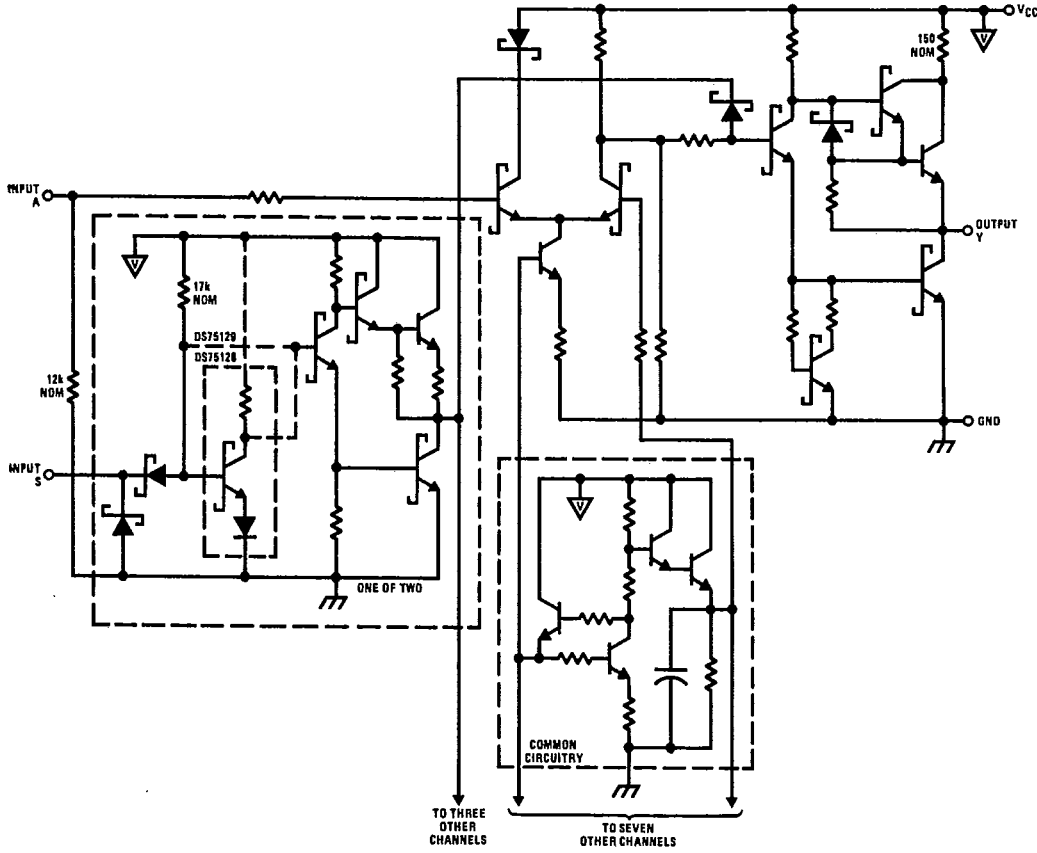
Switching Characteristics $V_{CC} = 5V, T_A = 25^\circ C$

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Symbol	Parameter	Conditions	DS75128			DS75129			Units	
			Min	Typ	Max	Min	Typ	Max		
t_{PLH}	Propagation Delay Time, Low-to-High-Level Output	$R_L = 400\Omega,$ $C_L = 50\text{ pF},$ See Figure 1	7	14	25	7	14	25	ns	
t_{PHL}	Propagation Delay Time, High-to-Low-Level Output		10	18	30	10	18	30	ns	
t_{PLH}	Propagation Delay Time, Low-to-High-Level Output			26	40		20	35	ns	
t_{PHL}	Propagation Delay Time, High-to-Low-Level Output			22	35		16	30	ns	
t_{PLH}	Ratio of Propagation Delay Times		A	0.5	0.8	1.3	0.5	0.8	1.3	
t_{PHL}										
t_{TLH}	Transition Time, Low-to-High-Level Output			1	7	12	1	7	12	ns
t_{THL}	Transition Time, High-to-Low-Level Output		1	3	12	1	3	12	ns	

Schematic Diagram (each receiver)

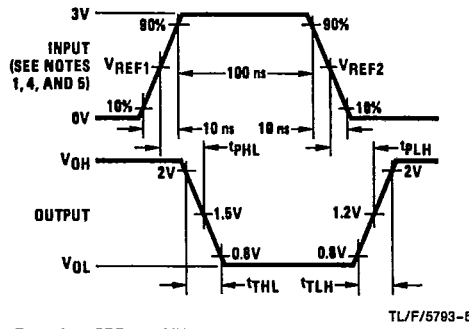
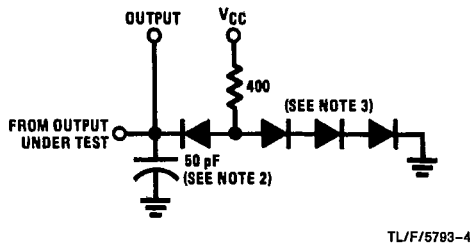


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TL/F/5793-3

AC Test Circuit and Switching Time Waveforms

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- Note 1:** Input pulses are supplied by a generator having the following characteristics: $Z_0 = 60\Omega$, PRR = 5 MHz.
- Note 2:** Includes probe and jig capacitance.
- Note 3:** All diodes are 1N3064 or equivalent.
- Note 4:** The strobe inputs of DS75129 are in-phase with the output.
- Note 5:** $V_{REF1} = 0.7V$ and $V_{REF2} = 1.7V$ for testing data (A) inputs, $V_{REF1} = V_{REF2} = 1.3V$ for strobe inputs.

FIGURE 1

Typical Characteristics

