

DS75125/DS75127 Seven-Channel Line Receivers

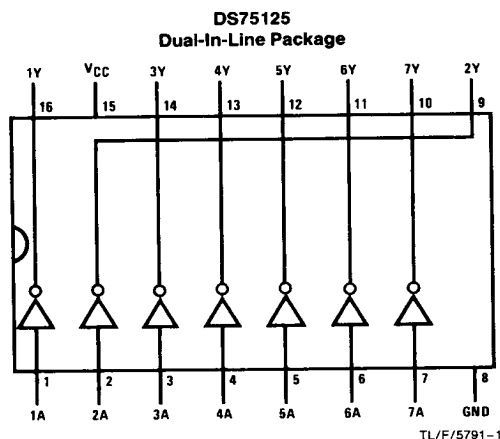
General Description

The DS75125 and DS75127 are monolithic seven-channel line receivers designed to satisfy the requirements of the IBM System 360/370 input/output interface specifications. Special low-power design and Schottky clamped transistors allow for low supply current requirements while maintaining fast switching speeds and high current TTL outputs. The DS75125 and DS75127 are characterized for operation from 0°C to 70°C.

Features

- Meets IBM 360/370 I/O specification
- Input resistance—7 k Ω to 20 k Ω
- Output compatible with TTL
- Schottky-clamped transistors
- Operates from single 5V supply
- High speed—low propagation delay
- Ratio specification for propagation delay time, low-to-high/high-to-low
- Seven channels in one 16-pin package
- Standard V_{CC} and ground positioning on DS75127

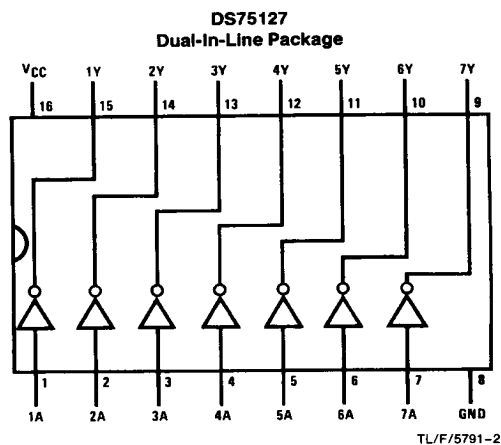
Connection Diagrams



Top View

logic: Y = A

Order Number DS75125J or DS75125N
See NS Package Number J16A or N16A



Top View

logic: Y = A

Order Number DS75127J or DS75127N
See NS Package Number J16A or N16A

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} (Note 1)	7V
Input Voltage Range	–0.15V to 7V
DS75125	–2V to 7V
DS75127	
Operating Free-Air Temperature Range	0°C to 70°C
Storage Temperature Range	–65°C to +150°C
Lead Temperature (Soldering, 4 seconds)	260°C

Maximum Power Dissipation* at 25°C (Note 2)

Cavity Package	1509 mW
Molded Package	1476 mW

*Derate cavity package 10.1 mW/°C above 25°C; derate molded package 11.9 mW/°C above 25°C.

Recommended Operating Conditions

	Min	Typ	Max	Units
Supply Voltage, V_{CC}	4.5	5	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		1.7			V
V_{IL}	Low-Level Input Voltage				0.7	V
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
I_{IH}	High-Level Input Current	$V_{CC} = 5.5V$, $V_I = 3.11V$		0.3	0.42	mA
I_{IL}	Low-Level Input Current	$V_{CC} = 5.5V$, $V_I = 0.15V$			–0.24	mA
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, or Open, $\Delta V_I = 0.15V$ to 4.15V	7		20	k Ω
I_{CC}	Supply Current	$V_{CC} = 5.5V$, $I_{OH} = -0.4$ mA, All Inputs at 0.7V		15	25	mA
		$V_{CC} = 5.5V$, $I_{OL} = 16$ mA, All Inputs at 4V		28	47	mA

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

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

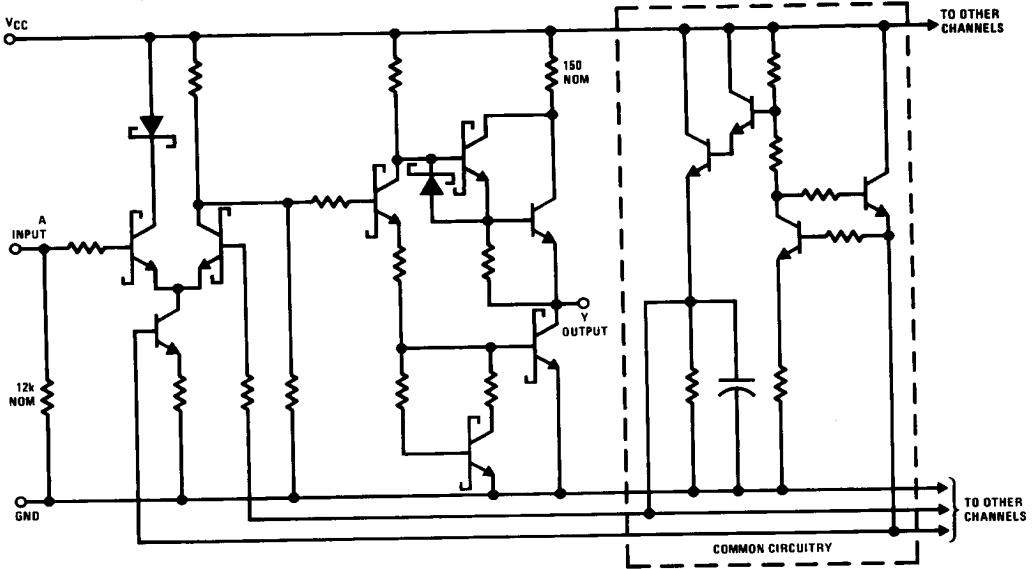
Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual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

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

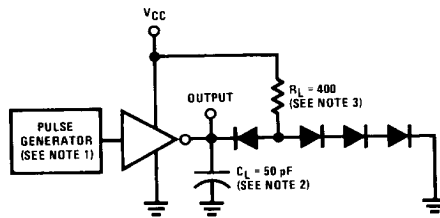
Note 3: All currents into device pins shown as positive, out of device pins as negative, all voltages referenced to ground unless otherwise noted. All values shown as max or min on absolute value basis.

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

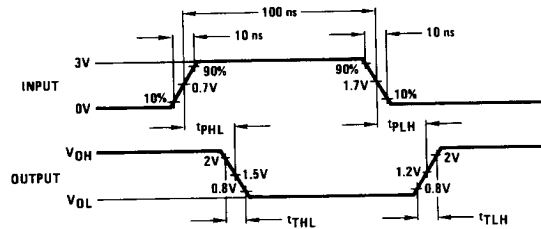
Note 5: All typical values are at $V_{CC} = 5V$, $T_A = 25^\circ C$.

Schematic (each receiver)

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AC Test Circuit and Switching Time Waveforms

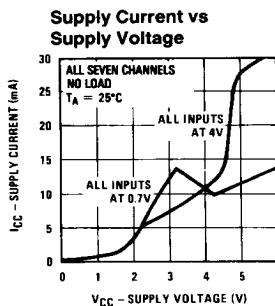
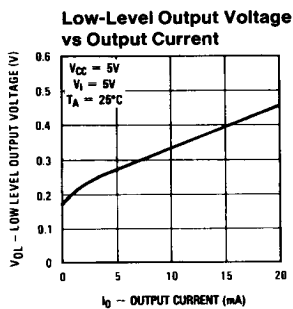
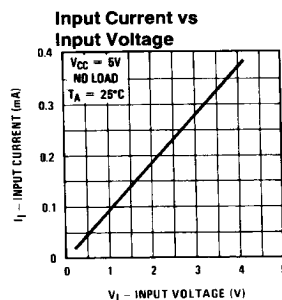
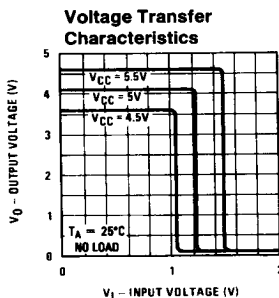
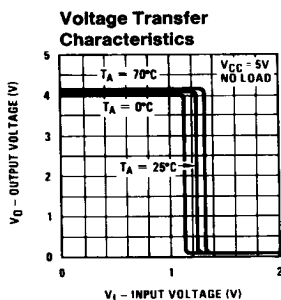
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Note 1: The pulse generator has the following characteristics: $Z_{OUT} = 50\Omega$, $PRR = 5\text{ MHz}$.**Note 2:** C_L includes probe and jig capacitance.**Note 3:** All diodes are 1N3064 or equivalent.**FIGURE 1**

Typical Performance Characteristics



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