

Am1489 • Am1489A

Quad RS-232C Line Receivers

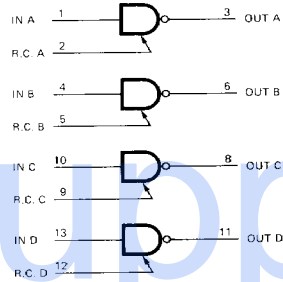
Distinctive Characteristics:

- Compatible with EIA specification RS-232C
- 100% reliability assurance testing in compliance with MIL STD 883
- Input signal range ± 30 volts
- Includes response control input and built-in hysteresis

FUNCTIONAL DESCRIPTION:

The Am1489 and Am1489A are quad line receivers whose electrical characteristics conform to EIA specification RS-232C. Each receiver has a single data input that can accept signal swings of up to ± 30 V. The output of each receiver is TTL/DTL compatible, and includes a $2k\Omega$ resistor pull-up to V_{CC} . An internal feedback resistor causes the input to exhibit hysteresis so that AC noise immunity is maintained at a high level even near the switching thresholds. For both devices, when a receiver is in a LOW state on the output, the input may drop as LOW as 1.25 volts without affecting the output. Both devices are guaranteed to switch to the HIGH state when the input voltage is below 0.75 V. Once the output has switched to the HIGH state, the input may rise to 1.0 V for the Am1489 or 1.75 V for the Am1489A without causing a change in the output. The Am1489 is guaranteed to switch to a LOW output when its input reaches 1.5 V and, the Am1489A is guaranteed to switch to a LOW output when its input reaches 2.25 V. Because of this hysteresis in switching thresholds, the devices can receive signals with superimposed noise or with slow rise and fall times without generating oscillations on the output. The threshold levels may be offset by a constant voltage by applying a DC bias to the response control input. A capacitor added to the response control input will reduce the frequency response of the receiver for applications in the presence of high frequency noise spikes. The companion line driver is the Am1488.

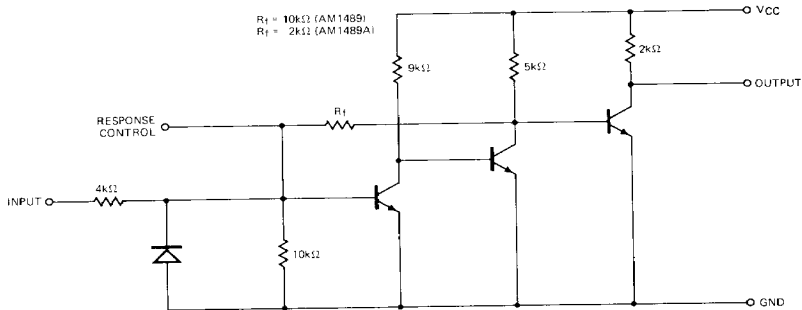
LOGIC SYMBOL



V_{CC} = PIN 14
GND = PIN 7

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CIRCUIT DIAGRAM (one receiver)

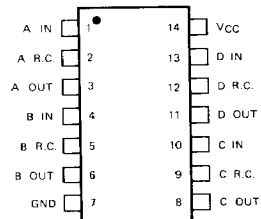


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Am1489/Am1489A ORDERING INFORMATION

Package Type	Temperature Range	Am1489 Order Number	Am1489A Order Number
14-pin Molded DIP	0°C to +75°C	AM1489PC	AM1489APC
14-pin Hermetic DIP	0°C to +75°C	MC1489L	MC1489AL
Dice	0°C to +75°C	AM1489XC	AM1489AXC

CONNECTION DIAGRAM Top View



NOTE: PIN 1 is marked for orientation.

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Am1489/1489A**MAXIMUM RATINGS** (Above which the useful life may be impaired)

Storage Temperature	-65°C to +175°C
Temperature (Ambient) Under Bias	0°C to +75°C
Supply Voltage to Ground Potential (Pin 14 to Pin 7) Continuous	-0.5 V to +10 V
DC Voltage Applied to Outputs for High Output State	-0.5 V to +V _{CC} max
Input Signal Range	-30 V to +30 V
Output Current, Into Outputs	30 mA
DC Input Current	Defined by Input Voltage Limits

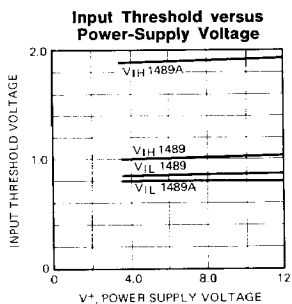
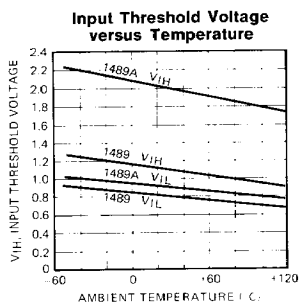
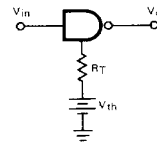
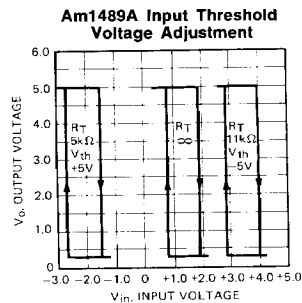
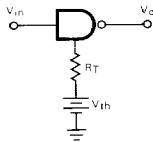
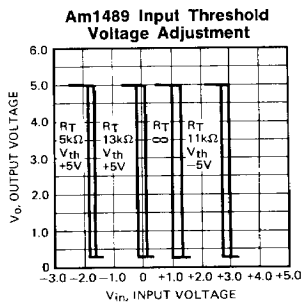
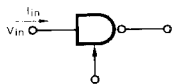
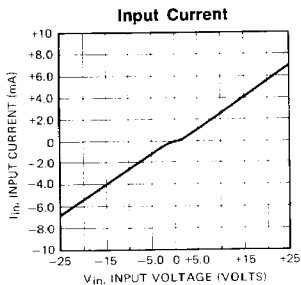
ELECTRICAL CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (Unless Otherwise Noted)Am1489, Am1489A T_A = 0°C to +75°C V_{CC} = 5.0 V ± 1% Response control pin open

Parameters	Description	Test Conditions	Min	Typ (Note 1)	Max	Units
V _{OH}	Output HIGH Voltage	I _{OH} = -0.5 mA V _{IN} = +0.75 V or open	2.6	4.0		Volts
V _{OL}	Output LOW Voltage	I _{OL} = 10 mA V _{IN} = 3.0 V		0.2	0.45	Volts
V _{IH}	Input HIGH Level Threshold	T _A = 25°C V _{OL} = 0.45 V	Am1489 1.0 Am1489A 1.75	1.25 1.95	1.5 2.25	Volts
V _{IL}	Input LOW Level Threshold	T _A = 25°C, V _{OH} = +2.5 V	0.75		1.25	Volts
I _{IL}	Input LOW Current	V _{IN} = -3.0 V	-0.43			mA
I _{IH}	Input HIGH Current	V _{IN} = -2.5 V	-3.6		-8.3	mA
I _{IH}	Input HIGH Current	V _{IN} = +3.0 V	0.43			mA
I _{SC}	Output Short Circuit Current	V _{IN} = +2.5 V V _{OUT} = 0.0 V		3.0		mA
I _{CC}	Power Supply Current	V _{CC} = MAX.		20	26	mA

Note: 1) Typical Limits are at V_{CC} = 5.0 V, 25°C ambient and maximum loading.**Switching Characteristics** (T_A = 25°C, response control pin open, C_L = 15 pF)

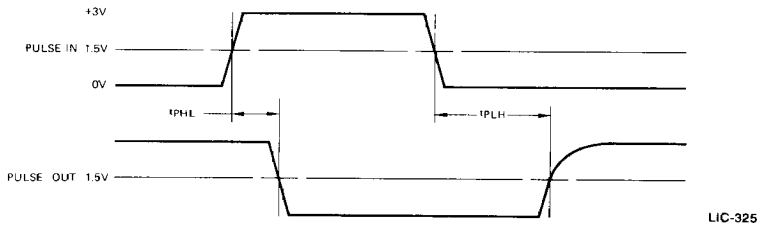
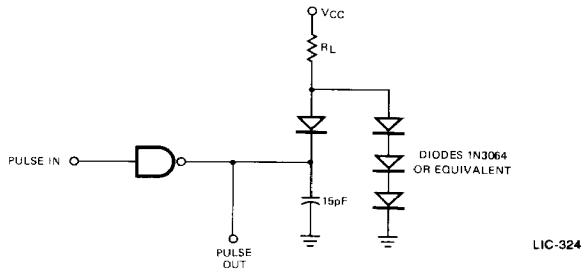
Parameters	Definition	Test Conditions	Min	Typ	Max	Units
t _{PLH}	Delay from Input LOW to Output HIGH	R _L = 3.9 kΩ		25	85	ns
t _{PHL}	Delay from Input HIGH to output LOW	R _L = 390 Ω		25	50	ns
t _r	Output Rise Time (10% to 90%)	R _L = 3.9 kΩ		120	175	ns
t _f	Output Fall Time (90% to 10%)	R _L = 390 Ω		10	20	ns

TYPICAL CHARACTERISTICS

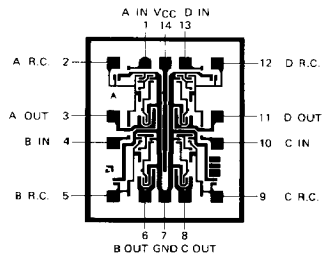


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SWITCHING TIME TEST CIRCUIT & WAVEFORMS



Metallization and Pad Layout



DIE SIZE 0.047" X 0.059"