

# MC1489/MC1489A

## Quad Line Receivers

### Product Specification

#### Linear Products

#### DESCRIPTION

The MC1489/MC1489A are quad line receivers designed to interface data terminal equipment with data communications equipment. They are constructed on a single monolithic silicon chip. These devices satisfy the specifications of EIA standard No. RS-232C.

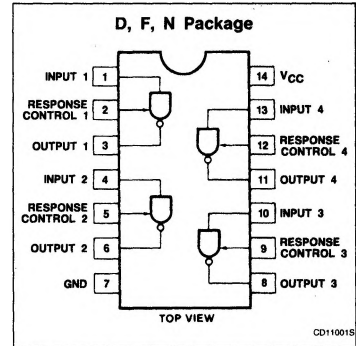
#### FEATURES

- Four totally separate receivers per package
- Programmable threshold
- Built-in input threshold hysteresis
- "Fail safe" operating mode
- Inputs withstand  $\pm 30V$

#### APPLICATIONS

- Computer port inputs
- Modems
- Eliminating noise in digital circuitry
- MOS-to-TTL/DTL translation

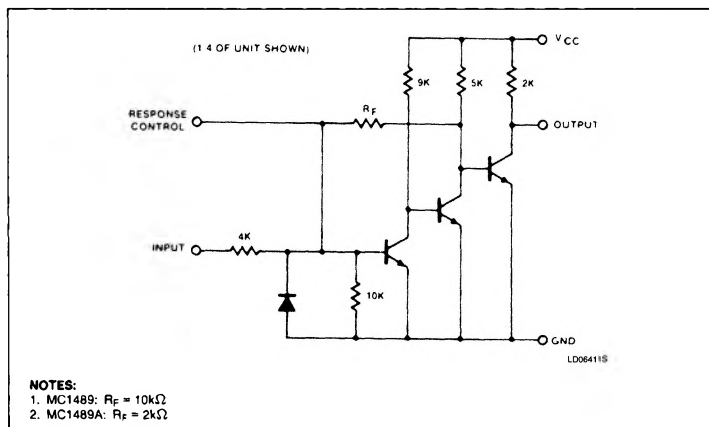
#### PIN CONFIGURATION



#### ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE
14-Pin Plastic DIP	0 to +70°C	MC1489N
14-Pin Plastic DIP	0 to +70°C	MC1489AN
14-Pin Cerdip	0 to +70°C	MC1489F
14-Pin Cerdip	0 to +70°C	MC1489AF
14-Pin Plastic SO	0 to +70°C	MC1489D
14-Pin Plastic SO	0 to +70°C	MC1489AD

#### EQUIVALENT SCHEMATIC



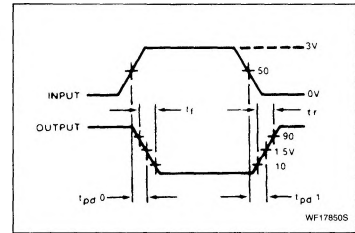
# Quad Line Receivers

# MC1489/MC1489A

## ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V <sub>CC</sub>	Power supply voltage	10	V
V <sub>IN</sub>	Input voltage range	± 30	V
I <sub>OUT</sub>	Output load current	20	mA
P <sub>D</sub>	Maximum power dissipation, T <sub>A</sub> = 25°C (still-air) <sup>1</sup>		
	F package	1190	mW
	N package	1420	mW
	D package	1040	mW
T <sub>A</sub>	Operating temperature range	0 to +75	°C
T <sub>STG</sub>	Storage temperature range	-65 to +150	°C

## VOLTAGE WAVEFORMS



### NOTE:

- Derate above 25°C, at the following rates:  
 F package at 9.5mW/°C  
 N package at 11.4mW/°C  
 D package at 8.3mW/°C

## DC ELECTRICAL CHARACTERISTICS V<sub>CC</sub> = 5.0V ± 1%, 0°C ≤ T<sub>A</sub> ≤ +75°C, unless otherwise specified.<sup>1, 2</sup>

SYMBOL	PARAMETER	TEST CONDITIONS	MC1489			MC1489A			UNIT
			Min	Typ	Max	Min	Typ	Max	
V <sub>IH</sub>	Input high threshold voltage	T <sub>A</sub> = 25°C, V <sub>OUT</sub> ≤ 0.45V, I <sub>OUT</sub> = 10mA	1.0		1.5	1.75		2.25	V
V <sub>IL</sub>	Input low threshold voltage	T <sub>A</sub> = 25°C, V <sub>OUT</sub> ≥ 2.5V, I <sub>OUT</sub> = -0.5mA	0.75		1.25	0.75		1.25	V
I <sub>IN</sub>	Input current	V <sub>IN</sub> = +25V	+3.6	+5.6	+8.3	+3.6	+5.6	+8.3	mA
		V <sub>IN</sub> = -25V	-3.6	-5.6	-8.3	-3.6	-5.6	-8.3	
		V <sub>IN</sub> = +3V	+0.43	+0.53		+0.43	+0.53		
		V <sub>IN</sub> = -3V	-0.43	-0.53		-0.43	-0.53		
V <sub>OH</sub>	Output high voltage	V <sub>IN</sub> = 0.75V, I <sub>OUT</sub> = -0.5mA	2.6	3.8	5.0	2.6	3.8	5.0	V
V <sub>OL</sub>	Output low voltage	Input = Open, I <sub>OUT</sub> = -0.5mA	2.6	3.8	5.0	2.6	3.8	5.0	V
		V <sub>IN</sub> = 3.0V, I <sub>OUT</sub> = 10mA		0.33	0.45		0.33	0.45	V
I <sub>SC</sub>	Output short-circuit current	V <sub>IN</sub> = 0.75V		3.0			3.0		mA
I <sub>CC</sub>	Supply current	V <sub>IN</sub> = 5.0V		20	26		20	26	mA
P <sub>D</sub>	Power dissipation	V <sub>IN</sub> = 5.0V		100	130		100	130	mW

### NOTES:

- Voltage values shown are with respect to network ground terminal. Positive current is defined as current into the referenced pin.
- These specifications apply for response control pin = open.

## AC ELECTRICAL CHARACTERISTICS V<sub>CC</sub> = 5.0V ± 1%, T<sub>A</sub> = 25°C, unless otherwise specified.<sup>1, 2</sup>

SYMBOL	PARAMETER	TEST CONDITIONS	MC1489			MC1489A			UNIT
			Min	Typ	Max	Min	Typ	Max	
t <sub>PD1</sub>	Input to output "high" Propagation delay	R <sub>L</sub> = 3.9kΩ (AC test circuit)		25	85		25	85	ns
t <sub>PD0</sub>	Input to output "low" Propagation delay	R <sub>L</sub> = 390Ω (AC test circuit)		20	50		20	50	ns
t <sub>R</sub>	Output rise time	R <sub>L</sub> = 3.9kΩ (AC test circuit)		110	175		110	175	ns
t <sub>F</sub>	Output fall time	R <sub>L</sub> = 390Ω (AC test circuit)		9	20		9	20	ns

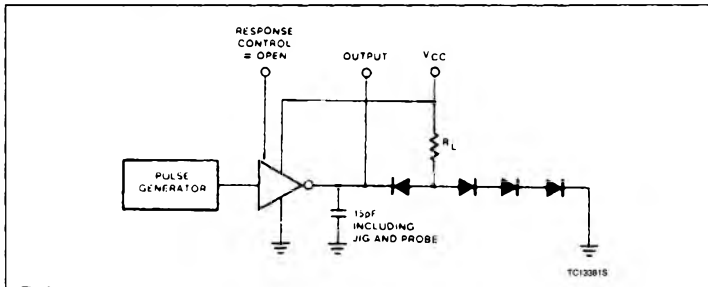
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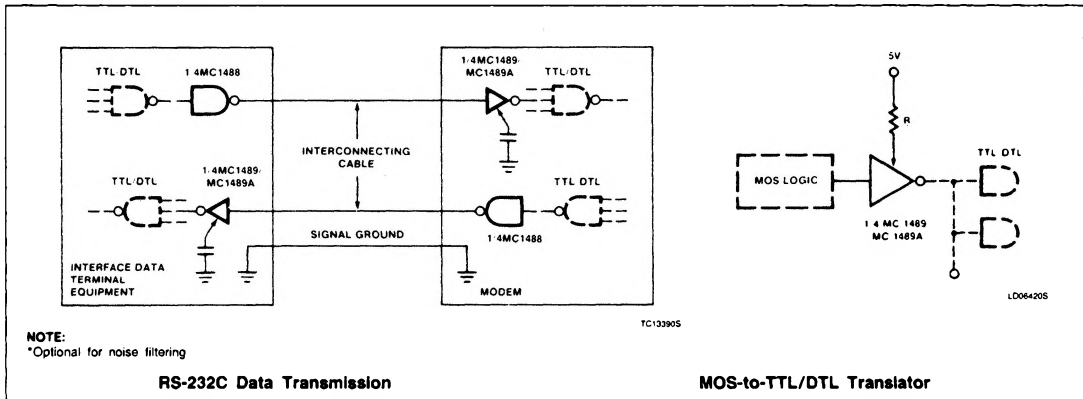
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## AC TEST CIRCUIT



## TYPICAL APPLICATIONS



**NOTE:**  
\*Optional for noise filtering

**RS-232C Data Transmission**

**MOS-to-TTL/DTL Translator**