

QUAD LINE RECEIVER

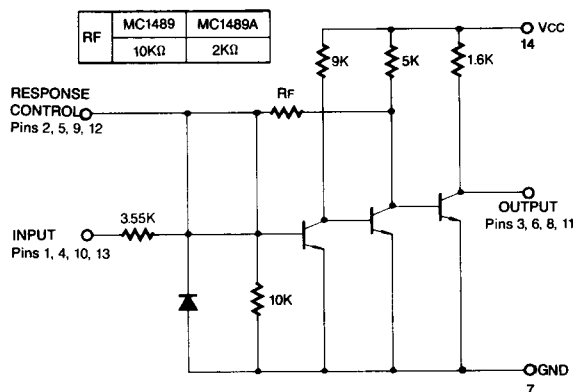
The MC1489 monolithic quad line receivers are designed to interface data terminal equipment with data communications equipment in conformance with the specifications of EIA Standard No. RS-232C.

FEATURES

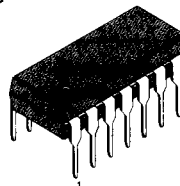
- Input Resistance: 3.0K Ω to 7.0K Ω
- Input Signal Range: ± 30 Volts
- Response Control
 - a) Logic Threshold Shifting
 - b) Input Noise Filtering
- Input Threshold Hysteresis Built in

SCHEMATIC DIAGRAM

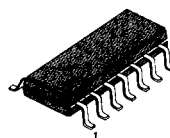
(1/4 OF CIRCUIT SHOWN)



14 DIP



14 SOP



2

ORDERING INFORMATION

Device	Package	Operating Temperature
MC1489N	14 DIP	0 ~ + 70°C
MC1489AN		
MC1489D	14 SOP	
MC1489AD		

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

Characteristic	Symbol	Value	Unit
Power Supply Voltage	V _{CC}	10	V _{DC}
Input Voltage Range	V _{IR}	± 40	V _{DC}
Output Load Current	I _L	20	mA
Power Dissipation Derate Above T _a = +25°C	P _D 1/ θ_{JA}	1000 6.7	mW mW/°C
Operating Temperature	T _a	0 to +70	°C
Storage Temperature	T _{stg}	-65 to +150	°C

ELECTRICAL CHARACTERISTICS

(V_{CC} = 5.0V ± 10%, T_a = 0 ~ 70°C unless otherwise noted)

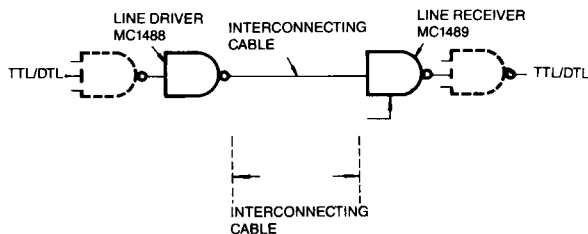
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Positive Input Current	I _{IH}	V _{IH} = 25Vdc	3.6	5.5	8.3	mA
		V _{IH} = 3.0Vdc	0.43	0.53		
Negative Input Current	I _{IL}	V _{IL} = -25Vdc	-3.6	-5.5	-8.3	mA
		V _{IL} = -3.0Vdc	-0.43	-0.53		
Input Turn-On Threshold Voltage MC1489 MC1489A	V _{IH}	T _a = 25°C, V _{OL} ≤ 0.45V I _L = 10mA	1.0	1.3	1.5	Vdc
			1.75	1.95	2.25	
Input Turn-Off Threshold Voltage	V _{IL}	T _a = 25°C, V _{OH} ≥ 2.5V, I _L = -0.5mA	0.75	1.0	1.25	Vdc
Output Voltage High	V _{OH}	V _{IN} = 0.75V, I _L = -0.5mA	2.6	4.0	5.0	Vdc
		Input Open, I _L = -0.5mA	2.6	4.0	5.0	
Output Voltage Low	V _{OL}	V _{IN} = 3.0V, I _L = 10mA		0.15	0.45	Vdc
Output Short Circuit Current	I _{OS}	V _{IN} = 0.75V		-2.6	-4.0	mA
Power Supply Current	I _{CC}	All gates "on", I _{OUT} = 0mA, V _{IH} = 5.0V		15	26	mA
Power Consumption	P _C	V _{IH} = 5.0V		80	130	mW

SWITCHING CHARACTERISTICS

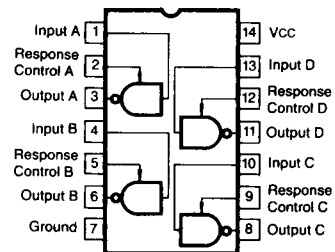
(V_{CC} = 5.0V ± 1%, T_a = 25°C, See Fig. 1)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time	t _{PLH}	R _L = 3.9KΩ		25	85	nS
Rise Time	t _{TLH}	R _L = 3.9KΩ		120	175	nS
Propagation Delay Time	t _{PHL}	R _L = 390Ω		25	50	nS
Fall Time	t _{THL}	R _L = 390Ω		10	20	nS

TYPICAL APPLICATION

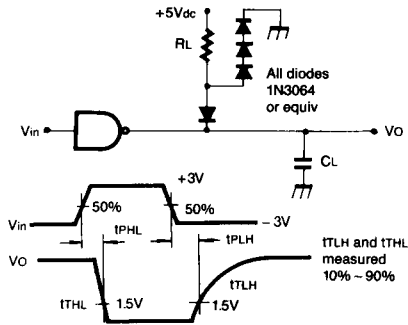


PIN CONNECTIONS



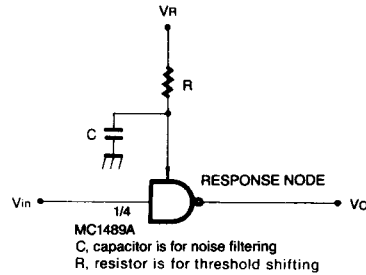
TEST CIRCUIT

Fig 1 — SWITCHING RESPONSE



$C_L = 15\text{pF}$ = total parasitic capacitance, which includes probe and wiring capacitances

Fig 2 — RESPONSE CONTROL NODE



C, capacitor is for noise filtering
R, resistor is for threshold shifting

TYPICAL PERFORMANCE CHARACTERISTICS

($V_{CC} = 5.0\text{ V}_{dc}$, $T_a = +25^\circ\text{C}$ unless otherwise noted)

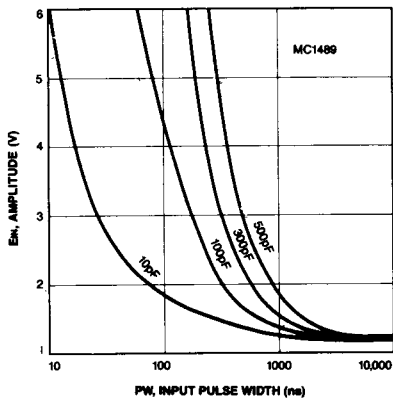
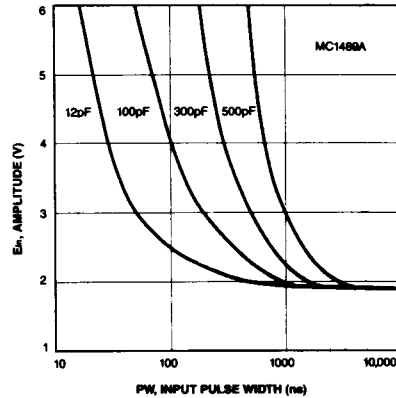
Fig. 3 — TYPICAL TURN-ON THRESHOLD V_{th} CAPACITANCE FROM RESPONSE CONTROL PIN TO GNDFig. 4 — TYPICAL TURN-ON THRESHOLD V_{th} CAPACITANCE FROM RESPONSE CONTROL PIN TO GND

Fig. 5 — INPUT CURRENT

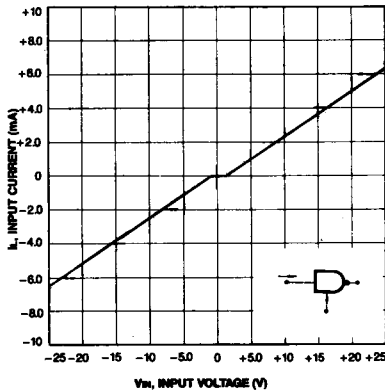


Fig. 7 — MC1489A INPUT THRESHOLD VOLTAGE ADJUSTMENT

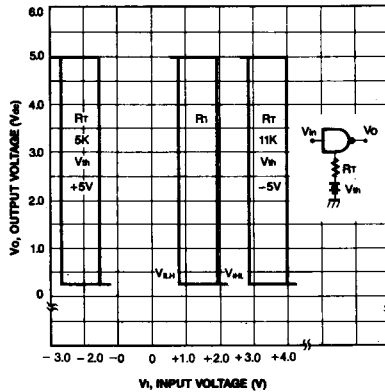
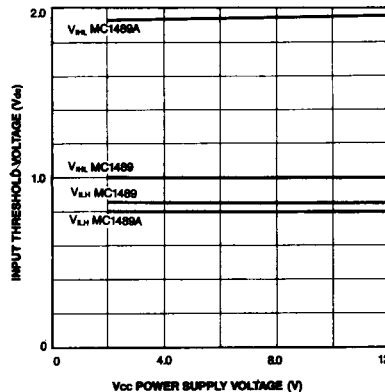
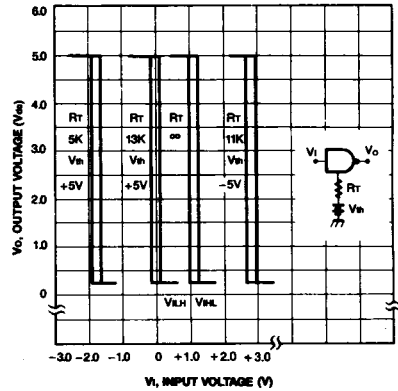
Fig. 8 — INPUT THRESHOLD V_{th} vs. POWER SUPPLY VOLTAGE

Fig. 6 — MC1489 INPUT THRESHOLD VOLTAGE ADJUSTMENT

Fig. 8 — INPUT THRESHOLD VOLTAGE V_{th} vs. TEMPERATURE