# μA1488

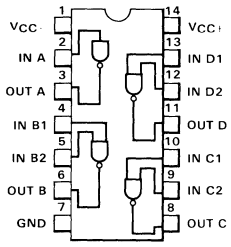
## QUAD LINE DRIVER

FAIRCHILD LINEAR INTEGRATED CIRCUITS

**GENERAL DESCRIPTION** – The μA1488 is an EIA RS-232C specified Quad Line Driver. This device is used to interface data terminals with data communications equipment. The μA1488 is a pin-for-pin replacement of the MC1488.

- **CURRENT LIMITED OUTPUT – ± 10 mA TYP**
- **POWER-OFF SOURCE IMPEDANCE – 300 Ω MIN**
- **SIMPLE SLEW RATE CONTROL WITH EXTERNAL CAPACITOR**
- **FLEXIBLE OPERATING SUPPLY RANGE**

**CONNECTION DIAGRAM**
**14-PIN DIP**
(TOP VIEW)
PACKAGE OUTLINE 6A 9A
PACKAGE CODE D P




**ORDER INFORMATION**

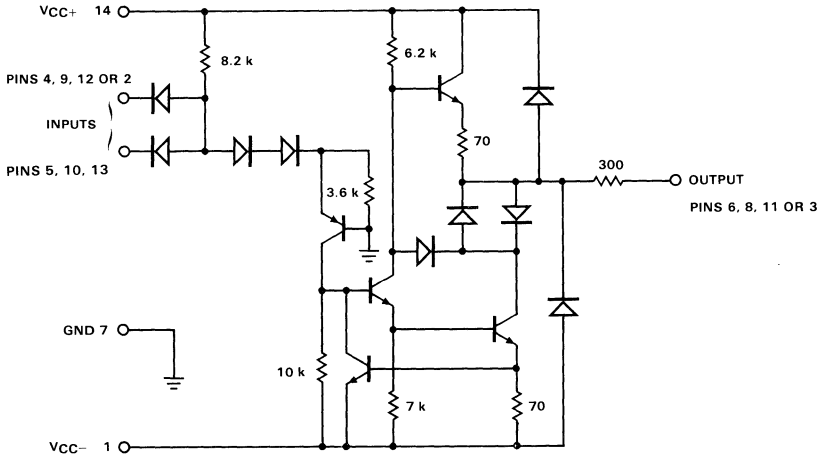
| TYPE | PART NO. |
|---|---|
| μA1488 | μA1488DC |
| μA1488 | μA1488PC |

**ABSOLUTE MAXIMUM RATINGS** (at 25°C unless otherwise noted)

| | |
|---|---|
| Power Supply Voltages | |
| $V_{CC}+$ | +15 V |
| $V_{CC}-$ | −15 V |
| Input Voltage Range ($V_{IR}$) | −15 V DC to +7.0 V DC |
| Output Signal Voltage | ±15 V DC |
| Continuous Total Power Dissipation (Note 1) | 800 mW |
| Operating Temperature Range | 0°C to 70°C |
| Pin Temperature | −65°C to +150°C |
| Hermetic DIP (Soldering, 60 s) | 300°C |
| Molded DIP (Soldering, 10 s) | 260°C |

Note 1: Above 60°C ambient temperatures, derate linearly at 8.3 mW/°C.

**CIRCUIT SCHEMATIC** (1/4 OF CIRCUIT SHOWN)



**ELECTRICAL CHARACTERISTICS:** $V_{CC+}$ = +9.0 V ± 1%, $V_{CC-}$ = −9.0 V ± 1%, $T_A$ = 0 to +70°C, unless otherwise noted.

| SYMBOL | CHARACTERISTICS | CONDITIONS | FIG. | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| $I_{IL}$ | Input LOW Current | $V_{IL}$ = 0 | 1 | | 1.0 | 1.6 | mA |
| $I_{IH}$ | Input HIGH Current | $V_{IH}$ = 5.0 V | 1 | | | 10 | μA |
| $V_{OH}$ | Output HIGH Voltage | $V_{IL}$ = 0.8 V, $R_L$ = 3.0 kΩ<br>$V_{CC+}$ = +9.0 V, $V_{CC-}$ = −9.0 V | 2 | +6.0 | +7.0 | | V |
| | | $V_{IL}$ = 0.8 V, $R_L$ = 3.0 kΩ<br>$V_{CC+}$ = +13.2 V, $V_{CC-}$ = −13.2 V | 2 | +9.0 | +10.5 | | |
| $V_{OL}$ | Output LOW Voltage | $V_{IH}$ = 1.9 V, $R_L$ = 3.0 kΩ<br>$V_{CC+}$ = +9.0 V, $V_{CC-}$ = −9.0 V | 2 | −6.0 | −7.0 | | V |
| | | $V_{IH}$ = 1.9 V, $R_L$ = 3.0 kΩ<br>$V_{CC+}$ = +13.2 V, $V_{CC-}$ = −13.2 V | 2 | −9.0 | −10.5 | | |
| $I_{OS+}$ | Positive Output Short-Circuit Current | $V_{IL}$ = 0.8 V (Note 1) | 3 | +6.0 | +10 | +12 | mA |
| $I_{OS-}$ | Negative Output Short-Circuit Current | $V_{IH}$ = 1.9 V (Note 1) | 3 | −6.0 | −10 | −12 | mA |
| $R_{OUT}$ | Output Resistance | $V_{CC+}$ = $V_{CC-}$ = 0 V, $V_O$ = ±2.0 V | 4 | 300 | | | Ω |
| $I_{CC+}$ | Positive Supply Current | $R_L$ = ∞<br>$V_{IH}$ = 1.9 V, $V_{CC+}$ = +9.0 V<br>$V_{IL}$ = 0.8 V, $V_{CC-}$ = +9.0 V<br>$V_{IH}$ = 1.9 V, $V_{CC+}$ = +12 V<br>$V_{IL}$ = 0.8 V, $V_{CC+}$ = +12 V<br>$V_{IH}$ = 1.9 V, $V_{CC+}$ = +15 V<br>$V_{IL}$ = 0.8 V, $V_{CC+}$ = +15 V | 5 | | +15<br>+4.5<br>+19<br>+5.5 | +20<br>+6.0<br>+25<br>+7.0<br>+34<br>+12 | mA |
| $I_{CC-}$ | Negative Supply Current | $R_L$ = ∞<br>$V_{IH}$ = 1.9 V, $V_{CC-}$ = −9.0 V<br>$V_{IL}$ = 0.8 V, $V_{CC-}$ = −9.0 V<br>$V_{IH}$ = 1.9 V, $V_{CC-}$ = −12 V<br>$V_{IL}$ = 0.8 V, $V_{CC-}$ = −12 V<br>$V_{IH}$ = 1.9 V, $V_{CC-}$ = −15 V<br>$V_{IL}$ = 0.8 V, $V_{CC-}$ = −15 V | 5 | | −13<br><br>−18 | −17<br>−15<br>−23<br>−15<br>−34<br>−2.5 | mA<br>μA<br>mA<br>μA<br>mA<br>mA |
| $P_C$ | Power Consumption | $V_{CC+}$ = 9.0 V, $V_{CC-}$ = −9.0 V<br>$V_{CC+}$ = 12 V, $V_{CC-}$ = −12 V | | | | 333<br>576 | mW |

**AC CHARACTERISTICS:** $V_{CC+}$ = +9.0 V ± 1%, $V_{CC-}$ = −9.0 V ± 1%, $T_A$ = 25°C

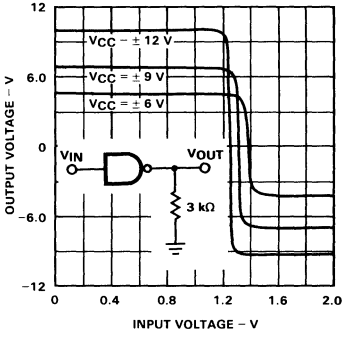
| SYMBOL | CHARACTERISTICS | CONDITION | FIG. | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay Time | $R_L$ = 3.0 kΩ, $C_L$ = 15 pF | 6 | | 220<br>70 | 350<br>175 | ns |
| $t_f$<br>$t_r$ | Fall Time<br>Rise Time | $R_L$ = 3.0 kΩ, $C_L$ = 15 pF | 6 | | 70<br>55 | 75<br>100 | ns |

NOTE 1: Maximum Package Power Dissipation may be exceeded if all outputs are shorted simultaneously.

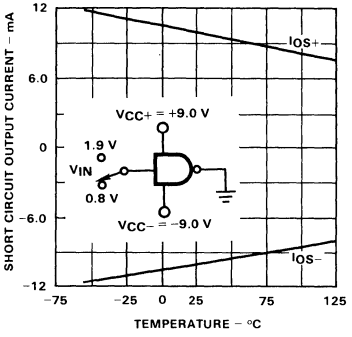
## TYPICAL CHARACTERISTICS

$T_A$ = +25°C unless otherwise noted

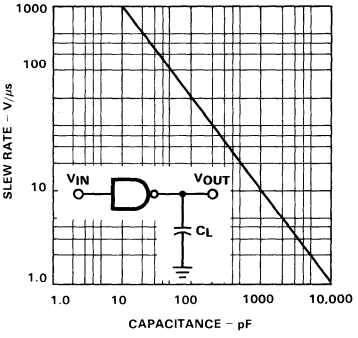
### TRANSFER CHARACTERISTICS AS A FUNCTION OF POWER SUPPLY VOLTAGE



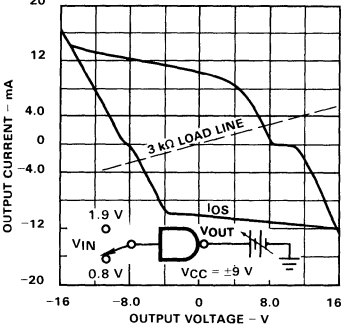

### SHORT CIRCUIT OUTPUT CURRENT AS A FUNCTION OF TEMPERATURE



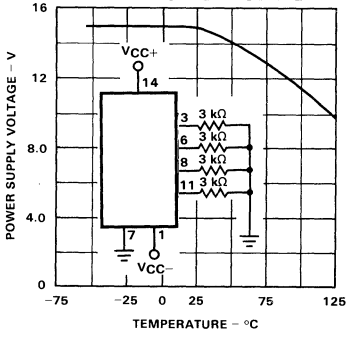

### OUTPUT SLEW RATE AS A FUNCTION OF LOAD CAPACITANCE




### OUTPUT VOLTAGE AND CURRENT LIMITING CHARACTERISTICS




### MAXIMUM OPERATING TEMPERATURE AS A FUNCTION OF POWER SUPPLY VOLTAGE



## DC TEST CIRCUITS

Fig. 1. Input Current

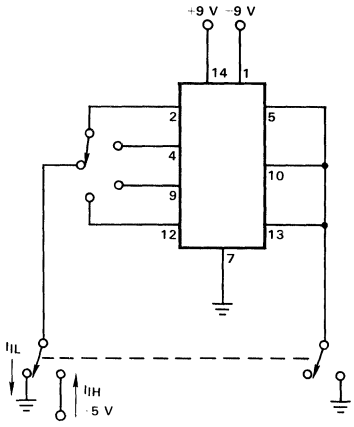



Fig. 2. Output Voltage

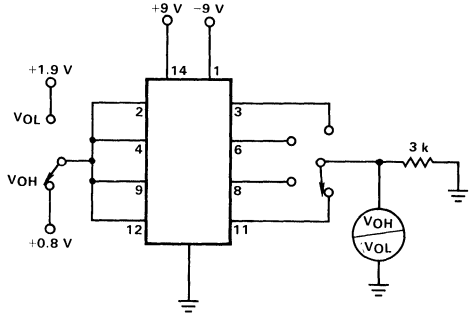



Fig. 3. Output Short-Circuit Current

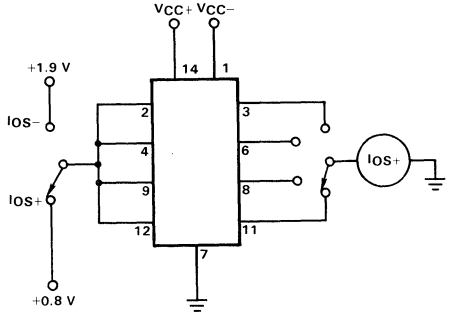



Fig. 4. Output Resistance (Power-off)

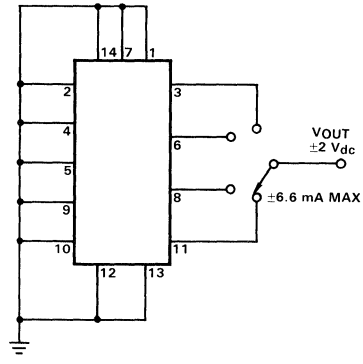



Fig. 5. Power-Supply Currents

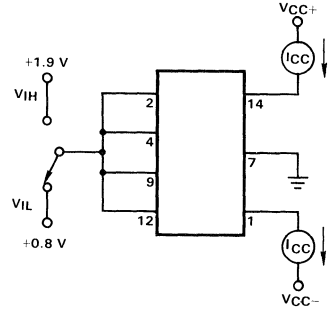
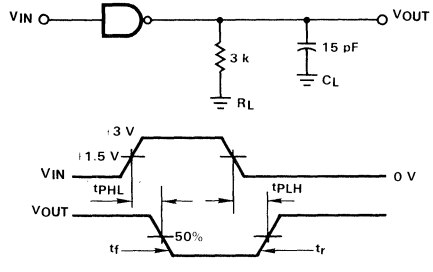



Fig. 6. AC Test Circuit and Voltage Waveform




$t_r$ and $t_f$ are measured 10% to 90%