GD75188
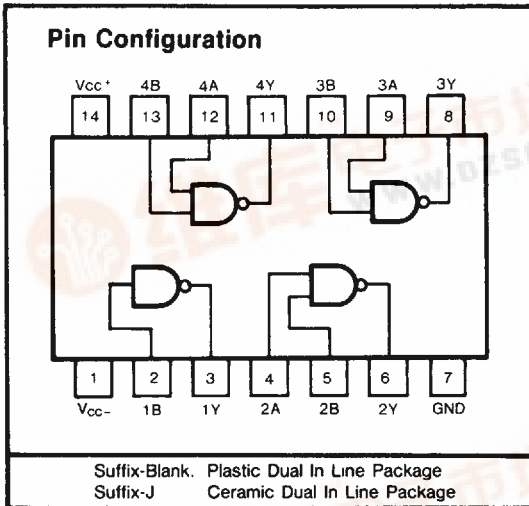## QUADRUPLE LINE DRIVERS

Feature
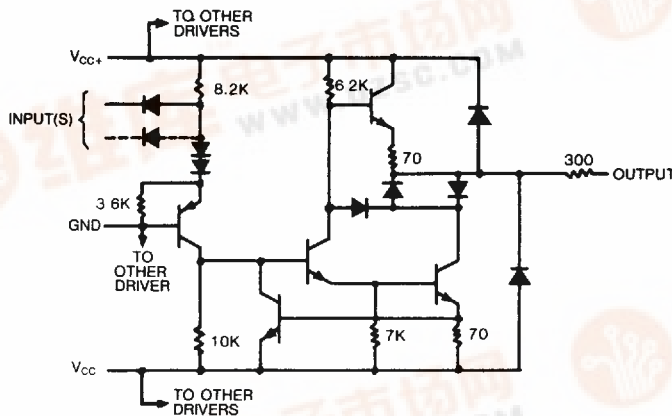
- Meets Specifications of EIA RS-232C
- Designed to be Interchangeable with SN75188
- Current Limited Output .. 10mA Typical
- Power-Off Output Impedance ... 300Ω Min
- Slew Rate Control by Load Capacitor
- Flexible Supply Voltage Range
- Input Compatible with Most TTL and DTL Circuits

Description

The GD75188 is a monolithic quadruple line driver designed to interface data terminal equipment with data communication equipment in conformance with the specifications of EIAstandard RS-232C with a diode in series with each supply-voltage terminal as shown under typical applications. The device is characterized for operation from 0°C to 75°C

Pin Configuration

Suffix-Blank. Plastic Dual In Line Package
Suffix-J   Ceramic Dual In Line Package

Schematic (each driver)

Function Table

A	B	Y
H	H	L
L	X	H
X	L	H

Absolute Maximum Ratings

- Supply voltage V_{CC+} ... 15V
- Supply voltage V_{CC-} ... $-15V$
- Input voltage range V_I ... $-15V \sim +7V$
- Output voltage range V_O ... $-15V \sim +15V$
- Continuous total dissipation at (or below) 25°C P_T ... 1W
- Operating free-air temperature range T_A ... $0 \sim +75°C$
- Storage temperature range T_{STG} ... $-65 \sim +175°C$
- Lead temperature 1/16 inch from case for 60 seconds, P Package ... 300°C
  seconds, J Package ... 260°C

Electrical Characteristics over recommended operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS		MIN TYP MAX	UNIT
V_{IH}	High-level input voltage			1 9	V
V_{IL}	Low-level input voltage			0.8	V
V_{OH}	High-level output voltage	$V_{IL} = 0.8V$	$V_{CC}+ = 9V$, $V_{CC}- = -9V$	6 7	V
		$R_L = 3k\Omega$	$V_{CC}+ = 13.2V$ $V_{CC}- = -13.2V$	9 10.5	
V_{OL}	Low-level output voltage	$V_{IH} = 1.9V$	$V_{CC}+ = 9V$ $V_{CC}- = -9V$	-7 -6	V
		$R_L = 3k\Omega$	$V_{CC}+ = 13.2V$	$-10\ 5$ -9	
			$V_{CC}- = -13.2V$		
I_{IH}	High-level input current	$V_I = 5V$		10	μA
I_{IL}	Low-level input current	$V_I = 0$		-1 -1.6	mA
$I_{OS}(H)$	Short-circuit output current at high level■	$V_I = 0.8V$	$V_O = 0$	-6 -10 -12	mA
$I_{OS}(L)$	Short-circuit output current at low level■	$V_I = 1.9V$	$V_O = 0$	6 10 12	mA
r_O	Output resistance, power off	$V_{CC}+ = 0$ $V_O = -2V$ to $2V$	$V_{CC}- = 0$	300	Ω
$I_{CC}+$	Supply current from $V_{CC}+$	$V_{CC}+ = 9V$,	All inputs at 1.9V	15 20	mA
		No load	All inputs at 0.8V	4.5 6	
		$V_{CC}+ = 12V$	All inputs at 1.9V	19 25	
		No load	All inputs at 0.8V	5.5 7	
		$V_{CC}+ = 15V$, No load,	All inputs at 1.9V	34	
		$T_A = 25°C$	All inputs at 0.8V	12	
$I_{CC}-$	Supply current from $V_{CC}-$	$V_{CC}- = -9V$,	All inputs at 1.9v	-13 -17	mA
		No load	All inputs at 0.8V	-0.015	
		$V_{CC}- = -12V$,	All inputs at 1.9V	-18 -23	
		No load	All inputs at 0.8V	-0.015	
		$V_{CC}- = -15V$, No load,	All inputs at 1.9V	-34	
		$T_A = 25°C$	All inputs at 0.8V	-2.5	
P_D	Total power dissipation	$V_{CC}+ = 9V$, No load	$V_{CC}- = -9V$	333	mW
		$V_{CC}+ = 12V$, No load	$V_{CC}- = -12V$	576	

⊏ All typical values are at $T_A = 25°C$
■ Not more than one output should be shorted at a time
NOTE: The algebraic convention where the more positive (less negative) limit is designated as maximum is used in this data sheet for logic voltage levels only, e g., if $-6V$ is a maximum, the typical value is a more negative voltage.

Switching Characteristcs, $V_{CC}+ = 9V$, $V_{CC}- = -9V$, $T_A = 25°C$

	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output			220	350	ns
t_{PHL}	Propagation delay time, high-to-low-level output	$R_L = 3k\Omega$,		100	175	ns
t_{TLH}	Transition time, low-to-high-level output‡	See Figure 1 $C_L = 15pF$		55	100	ns
t_{THL}	Transition time, high-to-low-level output‡			45	75	ns
t_{TLH}	Transition time, low-to-high-level outputs§	$R_L = 3k\Omega$ to $7k\Omega$,		2.5		μs
t_{THL}	Transition time, high-to-low-level outputs§	See Figure 1		3.0		μs

‡ Measured between 10% and 90% points of output waveform
§ Measured between $+3V$ and $-3V$ points on the output waveform (EIA RS-232C conditions)

Parameter Measurement Information

NOTE A The pulse generator has the following characteristics, $t_w = 0$ $5\mu s$, PRR=1 MHz, $Z_0 = 50\Omega$
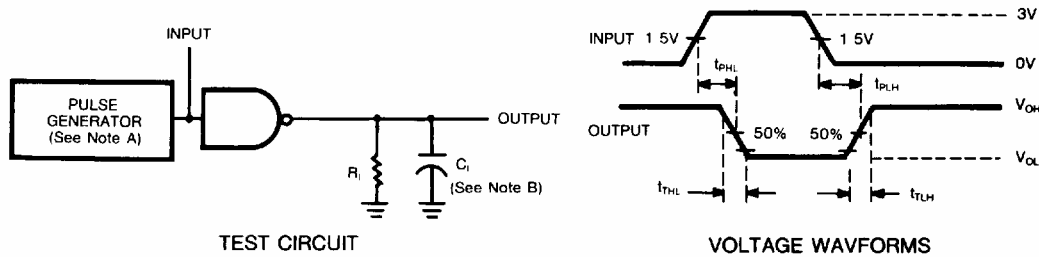
B C_1 includes probe and jig capacitance

INPUT

PULSE
GENERATOR
(See Note A)

OUTPUT

R_1

C_1
(See Note B)

TEST CIRCUIT

INPUT 1 5V

t_{PHL}

t_{PLH}

3V

0V

V_{OH}

OUTPUT

50% 50%

V_{OL}

t_{THL}

t_{TLH}

VOLTAGE WAVFORMS

Figure 1. Propagation and Transition Times

Thermal Information

MAXIMUM SUPPLY VOLTAGE
VS
FREE-AIR TEMPERATURE

V_{CC} - Supply voltage-V

$R_L \geqslant 3k\Omega$ (from each output to ground)

T_A-Free-Air Temperature − °C

Figure 2.

Typical Application Data

INPUT FROM
TTL OR DTL

1/4 GD75188

OUTPUT TO RTL
−0 7V TO 3 7V

1/4 GD75188

OUTPUT TO DTL
−0 7V TO 5 7V

1/4 GD75188

OUTPUT TO HNIL
−0 7V TO 10V

1 4 GD75188

1 KΩ

10KΩ

OUTPUT TO MOS
−10V TO 0V

−12V

$V_{CC+} = 12V$
$V_{CC-} = -12V$

Figure 3 - Logic Translator Applications

V_{CC+}

V_{CC+}

GD75188

±15V OUTPUT

GD75188

V_{CC-}

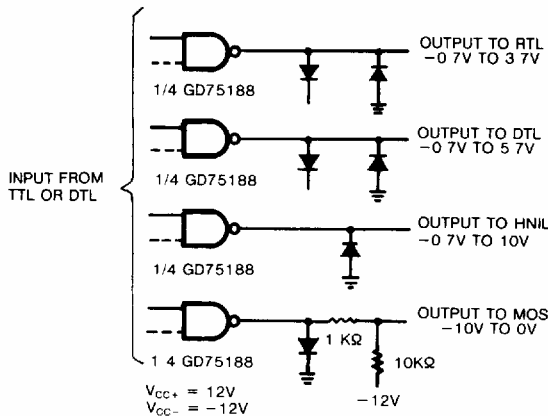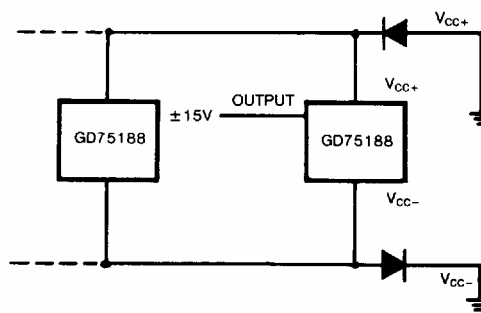V_{CC-}

**Figure 4 - Power Suply Protection to Meet Power-Off
Fault Conditions of Eia Standard RS-232C**