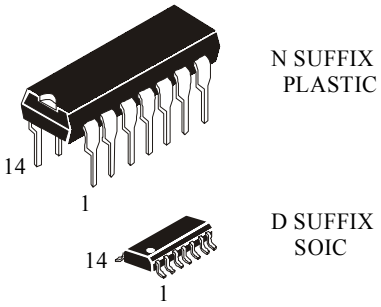


IN1488

Quadruple Line Drivers

The IN1488 is a monolithic quadruple line driver designed to interface data terminal equipment with data communication equipment in conformance with the specifications of EIA standard RS-232C.

- Meets specifications of EIA RS-232C
- Current limited output ± 10 mA Typical
- Power-off output impedance 300Ω Min
- Simple slew rate control by load capacitor
- Flexible operating supply range
- Input are TTL and DTL circuits compatible

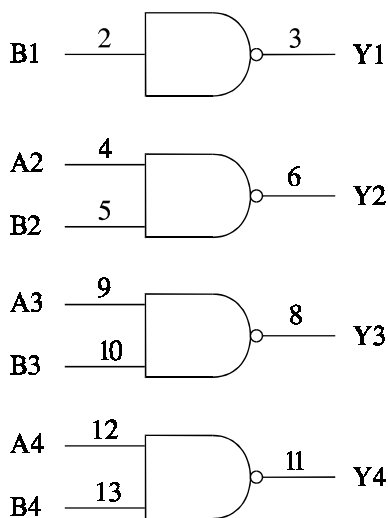


N SUFFIX
PLASTIC

D SUFFIX
SOIC

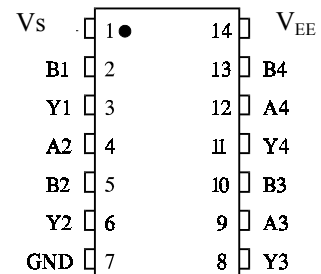
ORDERING INFORMATION
 IN1488N Plastic
 IN1488D SOIC
 IZ1488 Chip
 $T_A = 0^\circ$ to 70° C for all packages.

LOGIC DIAGRAM



PIN 1 = V_S
 PIN 14 = V_{EE}
 PIN 7 = GND

PIN ASSIGNMENT



FUNCTION TABLE

Inputs		Output
A	B	Y
H	H	L
L	X	H
X	L	H

X - don't care

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V _S	Supply Voltage	15	V
V _{EE}	Supply Voltage	- 15	V
V _I	Input Voltage Range	- 15 to 7	V
V _O	Output Voltage Range	-15 to 15	V
P _T	Continuous Total Dissipation at (or below) 25°C	1	W
T _{stg}	Storage Temperature Range	-65 to 150	°C

* Maximum Ratings are those values beyond damage to the device may occur. Functional operating should be restricted to the Recommended Operating Conditions.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _S	Supply Voltage		15	V
V _{EE}	Supply Voltage	-15		V
V _{IL}	Low Level Input Voltage	1.9		V
V _{IH}	High Level Input Voltage		0.8	V
T _A	Operating Temperature, All Package Types	-10	70	°C

DC ELECTRICAL CHARACTERISTICS ($T_A = -10^{\circ}\text{C}$ to 70°C)

Symbol	Parameter	Test Conditions		Guaranteed Limits		Unit
				Min	Max	
V_{OH}	High-Level Output Voltage	$V_{IL}=0.8\text{V}$ $R_L=3\text{k}\Omega$	$V_S=9\text{V}$ $V_{EE}=-9\text{V}$	6		V
			$V_S=13.2\text{V}$ $V_{EE}=13.2\text{V}$	9		
V_{OL}	Low-Level Output Voltage	$V_{IH}=1.9\text{V}$ $R_L=3\text{k}\Omega$	$V_S=9\text{V}$ $V_{EE}=-9\text{V}$	-6		V
			$V_S=13.2\text{V}$ $V_{EE}=-13.2\text{V}$	-9		
I_{IH}	High-Level Input Current	$V_I=5\text{V}$ $V_S=9\text{V}, V_{EE}=-9\text{V}$			10	μA
I_{IL}	Low-Level Input Current	$V_I=0\text{V}$ $V_S=9\text{V}, V_{EE}=-9\text{V}$			-1.6	mA
I_{OS}^*	Short-Circuit Output Current at High Level	$V_I=0.8\text{V}$ $V_O=0\text{V}$ $V_S=9\text{V}, V_{EE}=-9\text{V}$		-6	-12	mA
I_{OS}^*	Short-Circuit Output Current at Low Level	$V_I=1.9\text{V}$ $V_O=0\text{V}$ $V_S=9\text{V}, V_{EE}=-9\text{V}$		6	12	mA
r_O	Output Resistance, power off	$V_S=0\text{V}, V_{EE}=0\text{V}$ $V_O=-3\text{V}$ or 3V		300		Ω
I_{OC+}	Supply Current from V_S	$V_S=9\text{V}$,	All inputs at 1.9V		20	mA
			All inputs at 0.8V		6	
		$V_S=12\text{V}$	All inputs at 1.9V		25	
			All inputs at 0.8V		7	
		$V_S=15\text{V}$ $T_A=25^{\circ}\text{C}$	All inputs at 1.9V		34	
			All inputs at 0.8V		12	
I_{OC-}	Supply Current from V_{EE}	$V_{EE}=-9\text{V}$,	All inputs at 1.9V		-17	mA
			All inputs at 0.8V		-0.015	
		$V_{EE}=-12\text{V}$	All inputs at 1.9V		-23	
			All inputs at 0.8V		-0.015	
		$V_{EE}=-15\text{V}$ $T_A=25^{\circ}\text{C}$	All inputs at 1.9V		-34	
			All inputs at 0.8V		-2.5	

* Not more than one output should be shorted at a time

AC ELECTRICAL CHARACTERISTICS ($V_S = 9V, V_{EE} = -9V, T_A = 25^\circ C, t_r = t_f = 5ns$)

Symbol	Parameter	Test Condition	Guaranteed Limits		Unit
			Min	Max	
t_{PLH}	Propagation Delay Time, Low-to-High-Level Output	$R_L = 3k\Omega, C_L = 15pF$ See Figure 1		350	ns
t_{PHL}	Propagation Delay Time, High-to-Low-Level Output			175	ns
t_{TLH}	Transition Time, Low-to-High-Level Output *			100	ns
t_{THL}	Transition Time, High-to-Low-Level Output *			75	ns

* Measured between 10% and 90% points of output waveform.

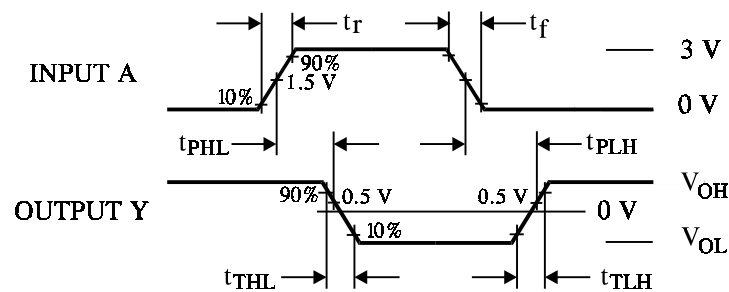
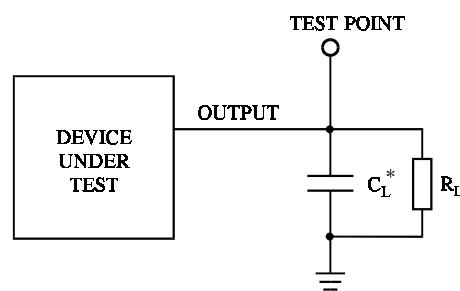


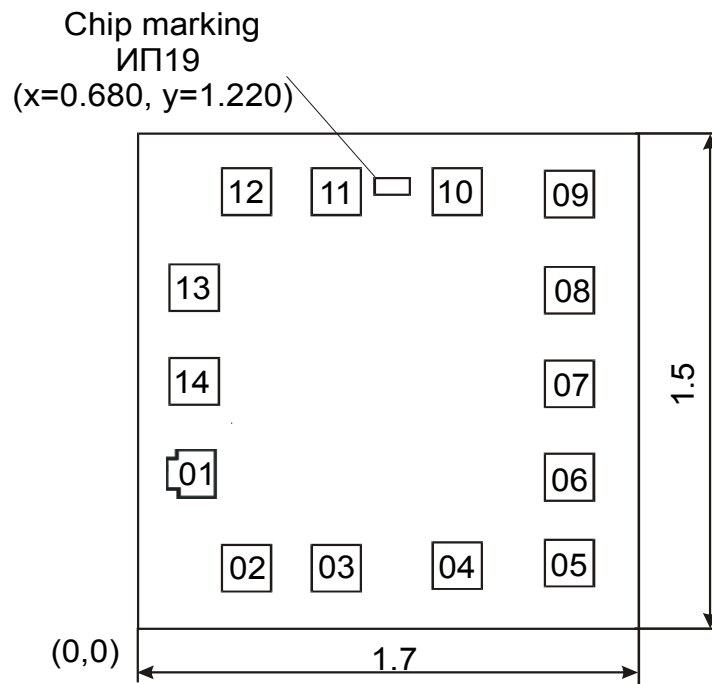
Figure 1. Switching Waveforms



* Includes all probe and jig capacitance

Figure 2. Test Circuit

CHIP PAD DIAGRAM IZ1488



Pad size 0.140 x 0.140 mm (Pad size is given as per metalization layer)
Thickness of chip $0,46 \pm 0,02$ mm

PAD LOCATION

Pad No	Symbol	X	Y
01	V _s	0.140	0.420
02	B1	0.150	0.140
03	Y1	0.540	0.140
04	A2	0.956	0.140
05	B2	1.370	0.140
06	Y2	1.370	0.410
07	GND	1.370	0.680
08	Y3	1.370	0.950
09	A3	1.370	1.220
10	B3	0.956	1.220
11	Y4	0.540	1.220
12	A4	0.270	1.220
13	B4	0.140	0.940
14	V _{EE}	0.140	0.680