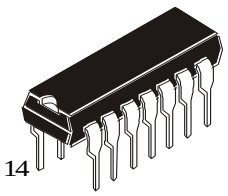
Quadruple Line Drivers

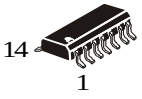
IN1488

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



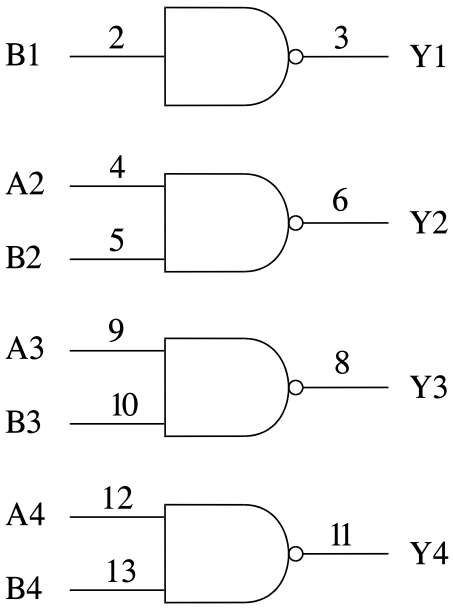
D SUFFIX
SOIC

IN1488N DIP-14
IN1488D/DT SOP-14

ORDERING INFORMATION

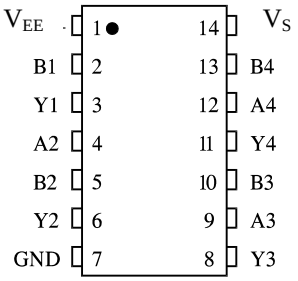
Device	Operating Temperature Range	Package	Shipping
IN1488N	T_A = 0 … + 70 °C	DIP-14	Tube
IN1488D		SOP-14	Tube
IN1488DT		SOP-14	Tape& Reel

LOGIC DIAGRAM



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

PIN ASSIGNMENT



UNCTION TAFBLE

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
Tstg	Storage Temperature Range	-65 to 150	°C

* Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device.
These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied.
Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
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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^{0}C to 70^{0}C)

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

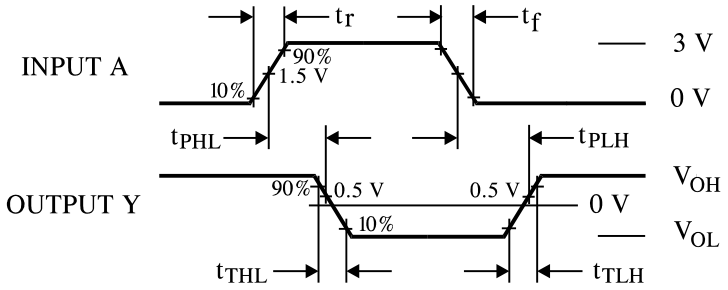
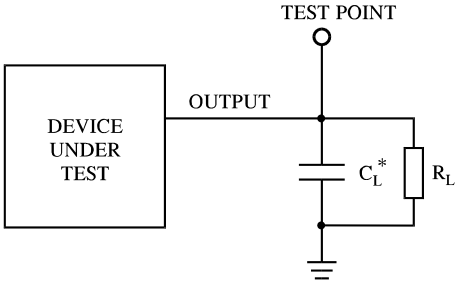


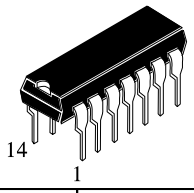
Figure 1. Switching Waveforms

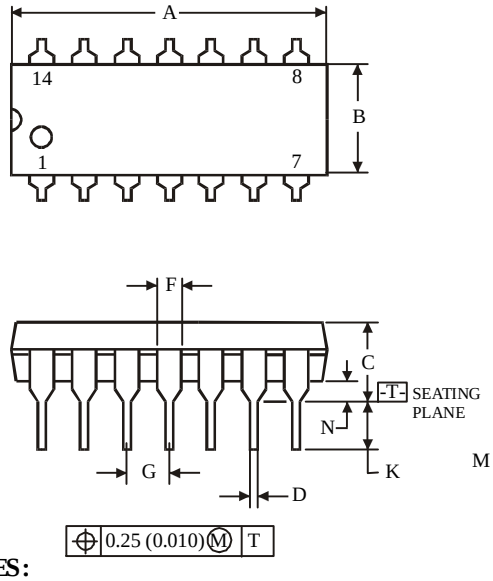


* Includes all probe and jig capacitance

Figure 2. Test Circuit

N SUFFIX PLASTIC DIP
(MS - 001AA)



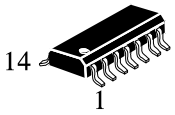


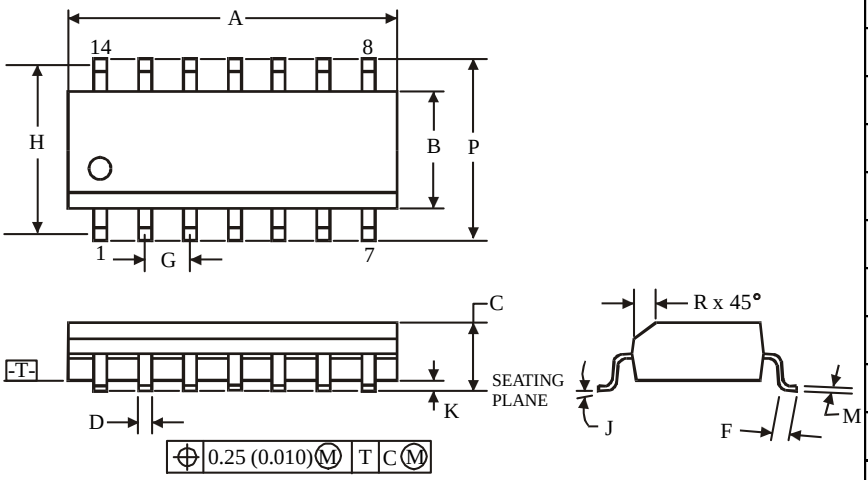
	Dimension, mm	
Symbol	**MIN**	**MAX**
A	18.67	19.69
B	6.1	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.2	0.36
N	0.38	

NOTES:

1. Dimensions “A”, “B” do not include mold flash or protrusions.
   Maximum mold flash or protrusions 0.25 mm (0.010) per side.

D SUFFIX SOIC
(MS - 012AB)





	Dimension, mm	
Symbol	**MIN**	**MAX**
A	8.55	8.75
B	3.8	4
C	1.35	1.75
D	0.33	0.51
F	0.4	1.27
G	1.27	
H	5.27	
J	0°	8°
K	0.1	0.25
M	0.19	0.25
P	5.8	6.2
R	0.25	0.5

NOTES:

1. Dimensions A and B do not include mold flash or protrusion.
2. Maximum mold flash or protrusion 0.15 mm (0.006) per side
   for A; for B – 0.25 mm (0.010) per side.