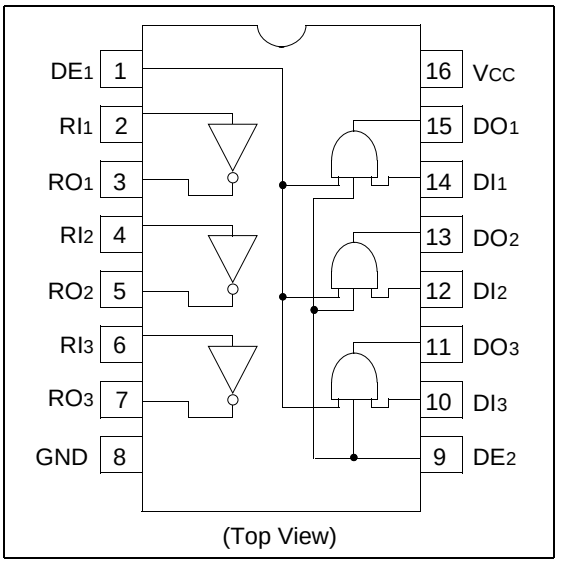
HD29468

Triple Line Drivers / Receivers

The HD29468 features line drivers and receivers for unbalanced transmissions, which meet the specs of IBM 360 and 370. This device has three drivers and receivers in one package. Input of driver and output of receiver are compatible with low power schottky TTL circuit and operates from a single 5 V power supply. The driver has two types of enable inputs. Sprius noise can be prevented by grounding either input when power supply is throw or cut off. The outputs are protected from short circuit and the wired logic is available due to emitter follower from for party line data bus applications. The device operates at high speed. Low to high level and high to low level propagation delay times defference are 10 ns max.

Pin Arrangement



(Top View)

Function Table

Driver

Input			Output
DI	DE1	DE2	DO
L	X	X	L
X	L	X	L
X	X	L	L
H	H	H	H

Receiver

Input RI	Output RO
L	H
H	L

H : High level
L : Low level
X : Immaterial

Absolute Maximum Ratings

Item		Symbol	Ratings	Unit
Supply Voltage		V_{CC}	+7	V
Driver Input Voltage		V_{ID}	–0.5 to +7	V
Driver Output Voltage		V_{OD}	–0.5 to +7	V
Receiver Input Voltage		V_{IR}	–0.5 to +7	V
Power Dissipation (Ta = 25 °C)	*1	DP	1000	mW
		FP	785	
Operating Temperature		T_a	0 to +75	°C
Storage Temperature		T_{stg}	–65 to +150	°C

Notes: 1. The above data were taken by the ΔV_{BE} method,mounting on a glass epoxy board ($40 \times 40 \times 1.6$ mm) of 10 % wiring density.

2. The absolute maximum ratings are values which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.75	5.00	5.25	V
Operating Temperature	T_a	0	—	75	°C

Electrical Characteristics

Driver (V_{CC} = 5.0 V ±5 %, Ta = 0 to +75°C)

Item		Symbol	Conditions	Min	Max	Unit
High Level Input Voltage		V_{IH}		2.0	—	V
Low Level Input Voltage		V_{IL}		—	0.8	V
Input Clamp Voltage		V_{IK}	V_{CC} = 4.75 V, I_{IN} = –18 mA	—	–1.5	V
High Level Output Voltage		V_{OH}	V_{CC} = 4.75 V, V_{IH} = 2.0 V I_{OH} = –59.3 mA (Ta = 25°C)	3.11	—	V
			V_{CC} = 5.25 V, V_{IH} = 2.0 V I_{OH} = –78.1 mA	—	4.1	
Low Level Output Voltage		V_{OL}	V_{CC} = 5.25 V, V_{IL} = 0.8 V I_{OL} = –0.24 mA, V_{IH} = 4.5 V	—	0.15	V
High Level Input Current	DI	I_{IH}	V_{CC} = 5.25 V, V_{IH} = 2.7 V	—	20	µA
	DE			—	60	
Low Level Input Current	DI	I_{IL}	V_{CC} = 5.25 V, V_{IL} = 0.4 V	—	–400	µA
	DE			—	–1200	
High Level Output Current		I_{OH}	V_{CC}=4.75 V, V_{IL} = 0 V, V_{OH} = 5.0 V	—	100	µA
			V_{CC} = 4.75 V, V_{IH} = 4.5 V, V_{OH} = 5.0 V	—	100	
Short Circuit Output Current		I_{OS}	V_{CC} = 5.25 V, V_{IH} = 4.5 V	—	–30	mA

Receiver (Ta = 0 to +75°C)

Item	Symbol	Conditions		Min	Max	Unit
High Level Output Threshold Voltage	V_{OTH}	V_{CC} = 4.75 V, V_{IL} = 1.15 V I_{OH} = –400 µA		2.7	—	V
Low Level Output Threshold Voltage	V_{OTL}	V_{CC} = 5.25 V, V_{IH} = 1.55 V I_{OL} = 8 mA		—	0.5	V
High Level Output Voltage	V_{OH}	V_{CC} = 4.75 V, V_{IN} : Open I_{OH} = –400 µA		2.7	—	V
Low Level Output Voltage	V_{OL}	V_{CC} = 4.75 V	I_{OL} = 8 mA	—	0.5	V
		V_{IH} = 1.55 V	I_{OL} = 4 mA	—	0.4	
Input Resistance	R_{IN}	V_{CC} = 0 V		7.4	20	kΩ
High Level Input Current	I_{IH}	V_{CC} = 4.75 V, V_{IH} = 3.11 V		—	0.42	mA
Low Level Input Current	I_{IL}	V_{CC} = 5.25 V, V_{IL} = 0.15 V		0.04	–0.24	mA
Short Circuit Output Current	I_{OS}	V_{CC} = 5.25 V, V_{IL} = 0 V		–20	–100	mA

Driver / Receiver (Ta = 0 to +75 °C)

Item	Symbol	Conditions	Min	Max	Unit
Supply Voltage	I_{CCH}	V_{CC} = 5.25 V, V_{IH} = 4.5 V	—	37	mA
	I_{CCL}	V_{CC} = 5.25 V, V_{IL} = 0 V	—	55	

Switching Characteristics

Driver (V_{CC} = 5.0 V, Ta = 25°C)

Item	Symbol	Conditions	Min	Max	Unit
Rise Propagation Delay Time	t_{PLH}	R_L = 47.5 Ω	6.5	18.5	ns
Fall Propagation Delay Time	t_{PHL}		6.5	18.5	ns
Propagation Delay Time Difference [*1]	Δt_{PD}		—	10	ns

Note: 1. $\Delta t_{PD} = |t_{PLH} - t_{PHL}|$

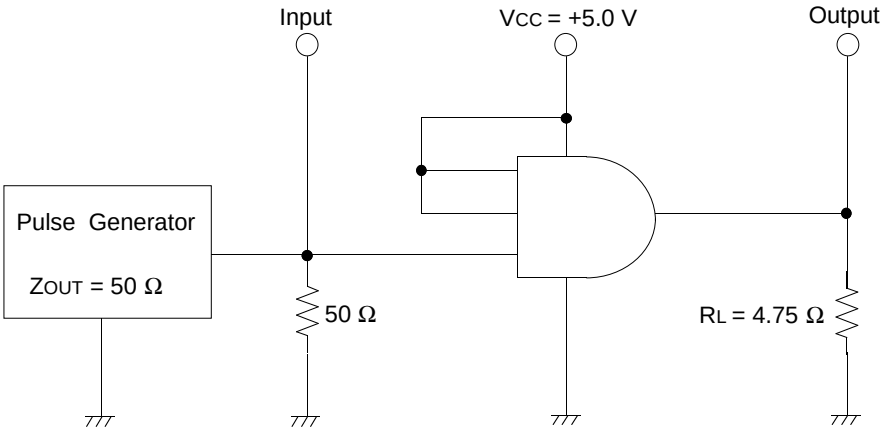
Receiver (V_{CC} = 5.0 V, Ta = 25°C)

Item	Symbol	Conditions	Min	Max	Unit
Rise Propagation Delay Time	t_{PLH}	R_L = 2 kΩ, C_L = 15pF	7.5	19.5	ns
Fall Propagation Delay Time	t_{PHL}		7.5	19.5	ns
Propagation Delay Time Difference [*1]	Δt_{PD}		—	10	ns

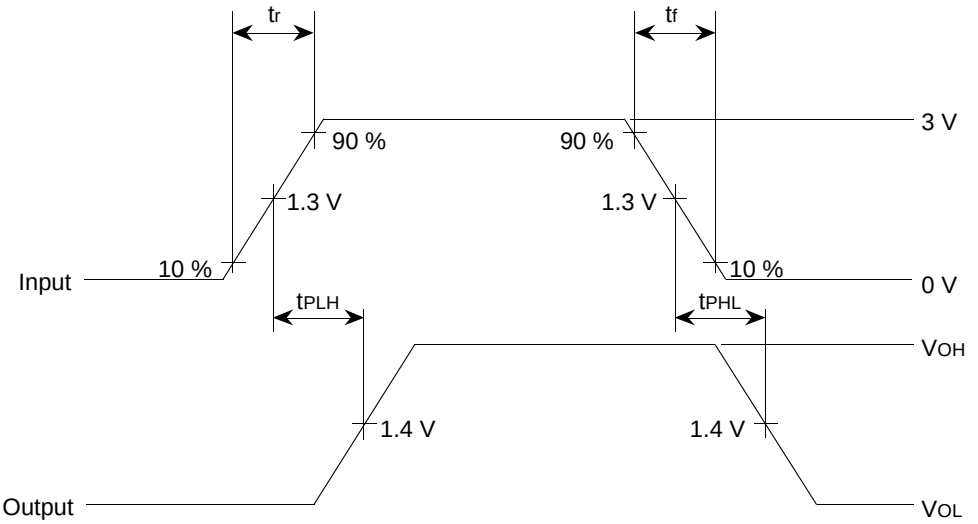
Note: 1. $\Delta t_{PD} = |t_{PLH} - t_{PHL}|$

Driver

Test Circuit



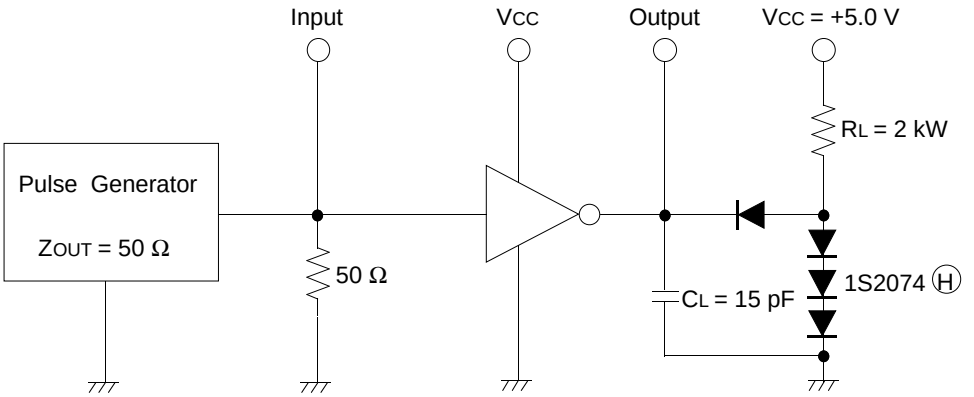
Waveforms



Notes: 1. t_r = 15 ns, t_f = 6 ns
2. Input waveforms : PRR = 1 MH z, duty cycle 50 %

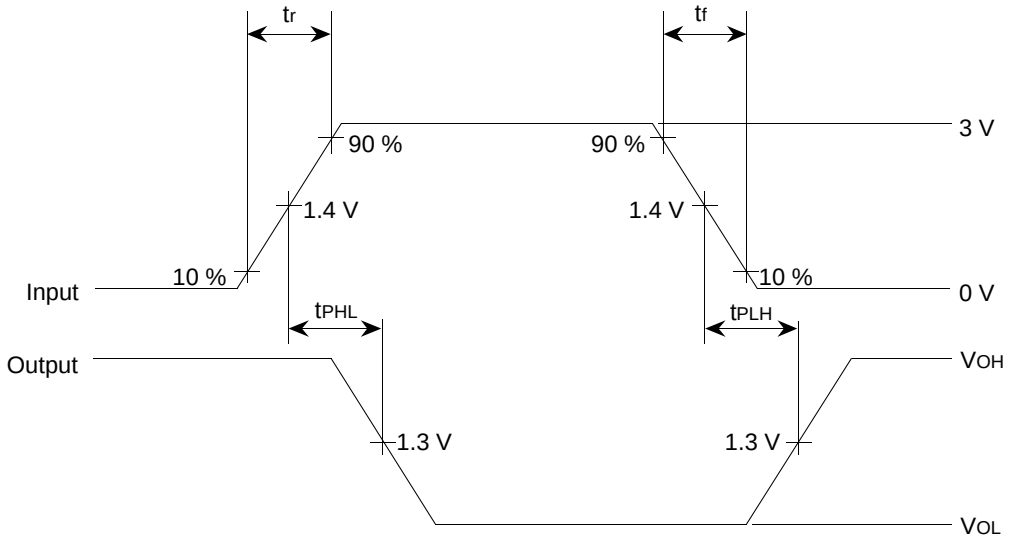
Driver

Test Circuit



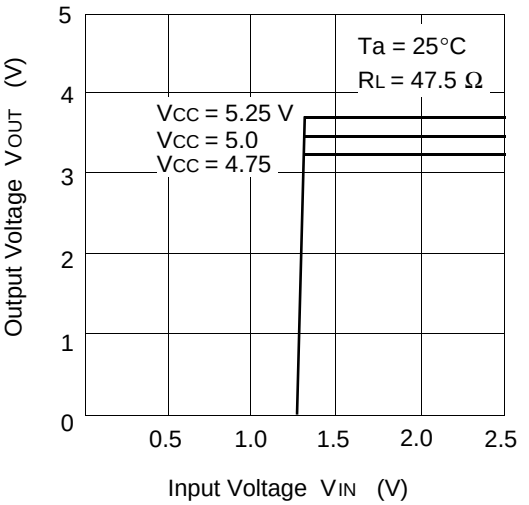
Note: 1. C_L includes probe and jig capacitance.

Waveforms

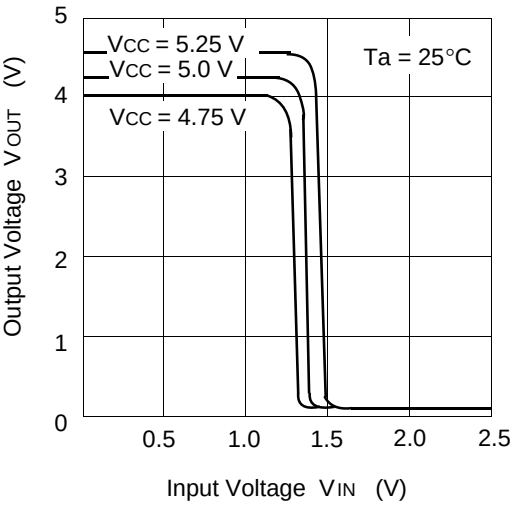


Notes: 1. $t_r = t_f = 10$ ns
2. Input waveforms : PRR = 1 MH z, duty cycle 50 %

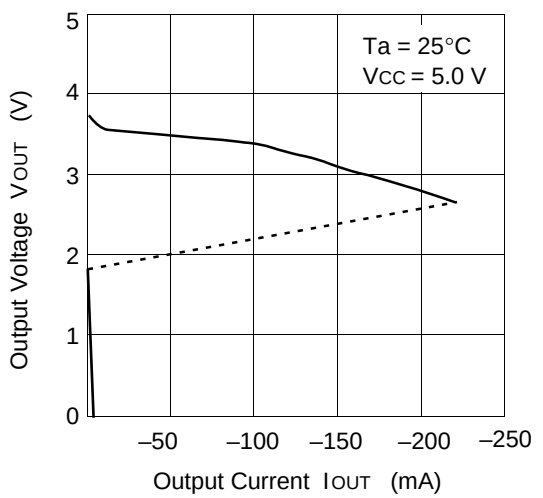
Driver V_{IN} – V_{OUT}



Receiver V_{IN} – V_{OUT}



Driver I_{OUT} – V_{OUT}



Receiver I_{OUT} – V_{OUT}