

SN54S436, SN74S436 LINE DRIVER/MEMORY DRIVER CIRCUITS

SDLS211 – JANUARY 1981 – REVISED MARCH 1988

MOS MEMORY INTERFACE

- Can Drive High-Impedance Loads
- Interchangeable with National DS16149 DS16179 Drivers
- High-Speed Switching
- Minimum Input Current Required
- Damping Output Resistor Reduces Transients

description

The SN54S436 and SN74S436 are monolithic integrated TTL-to-MOS drivers and interface circuits. The p-n-p input transistors use minimum current allowing increased fan-out to these drivers. Schottky-clamped transistor logic permits high-speed operation, minimum propagation time.

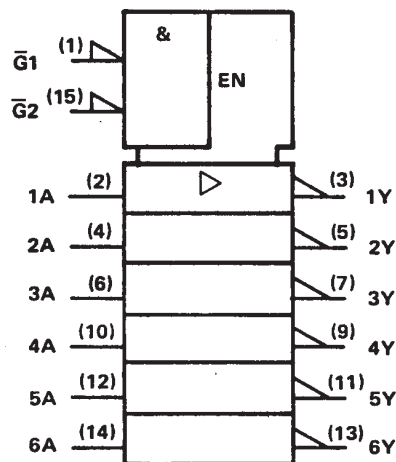
The small series damping resistor has been included in the design of the 'S436 to eliminate undesired output transient overshoot. Either enable, \bar{G} , when high, sets the outputs to the high level for MOS RAM refresh applications.

FUNCTION TABLE

ENABLE INPUTS		INPUT	OUTPUT
$\bar{G}1$	$\bar{G}2$		
L	L	L	H
L	L	H	L
X	H	X	H
H	X	X	H

H = high level, L = low level, X = irrelevant

logic symbol†

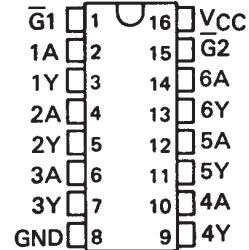


†This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.

Pin numbers shown are for D, J, N, and W packages.

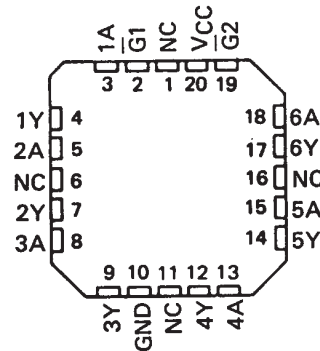
SN54S436 . . . J OR W PACKAGE
SN74S436 . . . D OR N PACKAGE

(TOP VIEW)



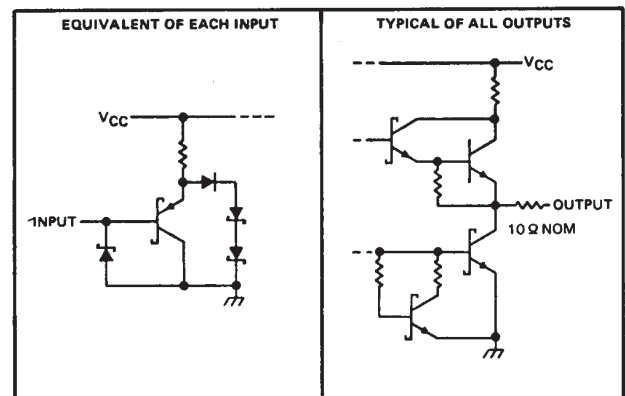
SN54S436 . . . FK PACKAGE

(TOP VIEW)



NC - No internal connection

schematics of inputs and outputs



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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage range	–1.5 to 7 V
Continuous total dissipation at (or below) 25°C free-air temperature (see Note 2)	
J package	1375 mW
N package	1150 mW
W package	1000 mW
Operating free-air temperature range: SN54S436	–55°C to 125°C
SN74S436	0°C to 70°C
Storage temperature range	–65°C to 150°C

NOTES: 1. All voltage values are with respect to network ground terminal.

2. For operation above 25°C free-air temperature, derate as follows: J package, 11.0 mW/°C, N package, 9.2 mW/°C, W package, 8.0 mW/°C.

recommended operating conditions

		SN54S436			SN74S436			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
T_A	Operating free-air temperature	–55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	SN54S436			SN74S436			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$	–0.75		–1.2	–0.75		–1.2	V
V_{OH}	$V_{CC} = \text{MIN}, I_{OH} = -10 \mu\text{A}$	3.4	4.3		3.5	4.3		V
	$V_{CC} = \text{MIN}, I_{OH} = -1 \text{ mA}$	2.4	3.5		2.6	3.5		
		2.5	3.5		2.7	3.5		
V_{OL}	$V_{CC} = \text{MIN}, I_{OL} = 10 \mu\text{A}$	0.25	0.4		0.25	0.35		V
	$V_{CC} = \text{MIN}, I_{OL} = 20 \text{ mA}$	0.6	1.1		0.6	1		
		0.4	0.5		0.4	0.5		
I_{OL}	$V_{CC} = \text{MIN}, V_O = 4.5 \text{ V}, V_I = 2 \text{ V}$ See Note 3	150	200		150	200		mA
I_{OS}^\ddagger	$V_{CC} = \text{MAX}, V_O = 0 \text{ V}$	–100	–250	–400	–100	–250	–400	mA
I_I	$V_{CC} = \text{MAX}, V_{IH} = 5.5 \text{ V}$			1			1	mA
I_{IH}	$V_{CC} = \text{MAX}, V_{IH} = 2.7 \text{ V}$	0.1	50		0.1	50		μA
I_{IL}	$V_{CC} = \text{MAX}, V_{IL} = 0.5 \text{ V}$	–100	–250		–100	–250		μA
I_{CC}	$V_{CC} = \text{MAX}, G \text{ inputs at } 0 \text{ V},$ All other inputs at 4.5 V	33	60		33	60		mA
	$V_{CC} = \text{MAX}, \text{ All inputs at } 0 \text{ V}$	14	20		14	20		

† All typical values are at $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$.

‡ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.



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switching characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{AHL} Delay time from A high to Y starting low	See Figure 1 $C_L = 50\text{ pF}$		4.5	7	ns
	$C_L = 500\text{ pF}$		12	16	
t_{ALYH} Delay time from A low to Y starting high	See Figure 1 $C_L = 50\text{ pF}$		5	8	ns
	$C_L = 500\text{ pF}$		11	16	
t_{GHYH} Delay time from G high to Y starting high	$R_L = 2\text{ k}\Omega$ to Gnd, See Figure 2 $C_L = 50\text{ pF}$		10	18	ns
t_{GLYL} Delay time from G low to Y starting low	$R_L = 2\text{ k}\Omega$ to V_{CC} , See Figure 3 $C_L = 50\text{ pF}$		11	18	ns
t_{THL} Transition time, high-to-low-level output	See Figure 1 $C_L = 50\text{ pF}$		5	8	ns
	$C_L = 500\text{ pF}$		15	30	
t_{TLH} Transition time, low-to-high-level output	See Figure 1 $C_L = 50\text{ pF}$		6	9	ns
	$C_L = 500\text{ pF}$		15	30	

PARAMETER MEASUREMENT INFORMATION

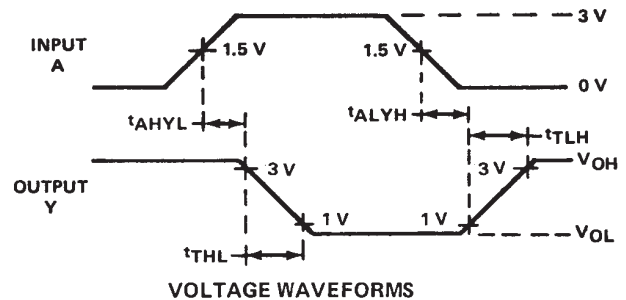
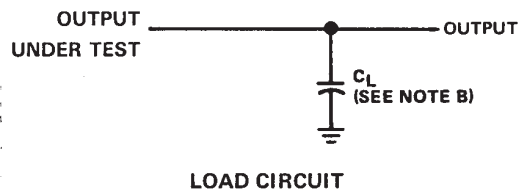


FIGURE 1

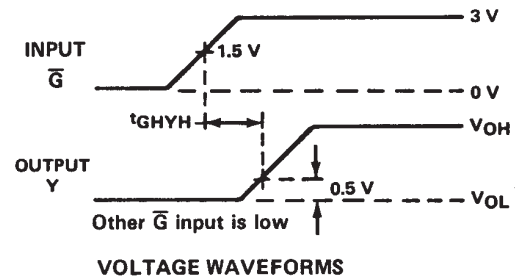
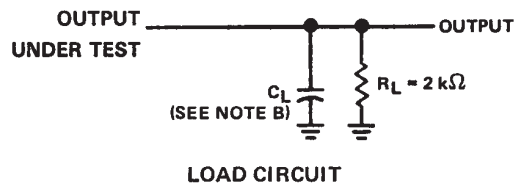


FIGURE 2

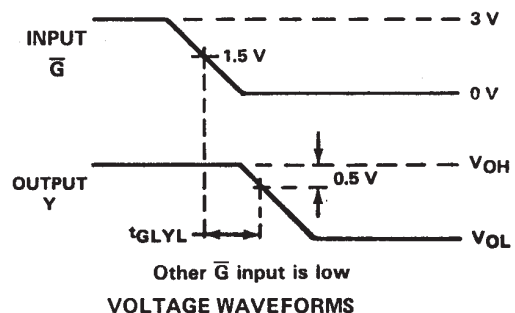
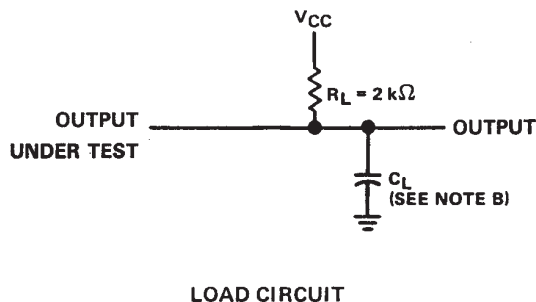


FIGURE 3

NOTES: A. Input pulses are supplied by a generator having the following characteristics: $PRR < 1\text{ MHz}$, $Z_{out} \approx 50\text{ }\Omega$, $t_r < 5\text{ ns}$.
B. C_L includes probe and jig capacitance.

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