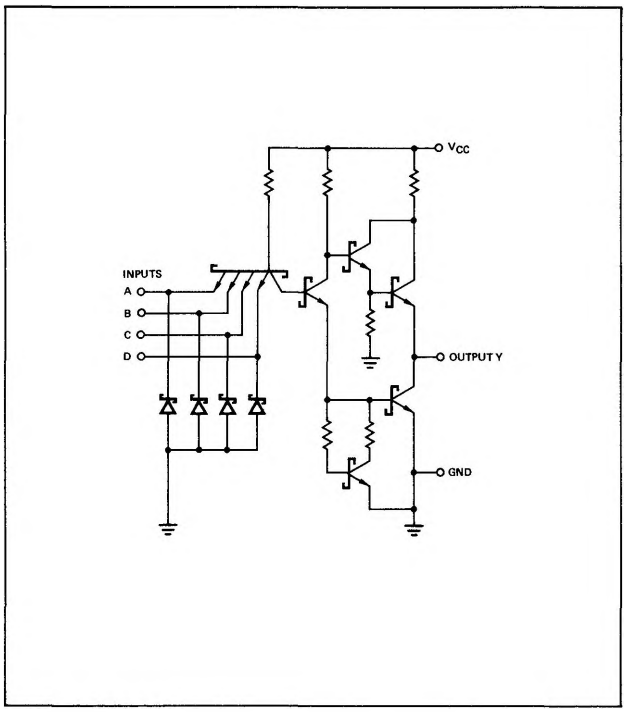
DUAL 4-INPUT POSITIVE-NAND BUFFERS/LINE DRIVERS

S54S40 S54S140 N74S40 N74S140

S54S40–A,F,W • S54S140–A,F,W • N74S40–A,F • N74S140–A,F

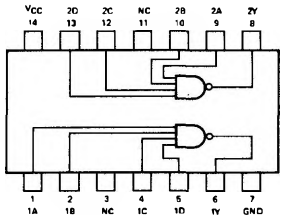
DIGITAL 54/74 TTL SERIES

SCHEMATIC (each gate)



PIN CONFIGURATIONS

A,F PACKAGE



NC – No internal connection

RECOMMENDED MAXIMUM FAN-OUT FROM EACH OUTPUT

Loads at a high logic level	60
Load at a low logic level	30

ELECTRICAL CHARACTERISTICS (over operating free-air temperature range unless otherwise noted)

PARAMETER		TEST CONDITIONS*			MIN	TYP**	MAX	UNIT
V_{IH}	High-level input voltage				2			V
V_{IL}	Low-level input voltage						0.8	V
V_I	Input clamp voltage	V_{CC} = MIN,	I_I = -18mA				-1.2	V
V_{OH}	High-level output voltage	V_{CC} = MIN, I_{OH} = -3mA	V_{IL} = 0.8V,	Series 54S	2.5	3.4		V
				Series 74S	2.7	3.4		
		V_{CC} = MIN, R_O = 50Ω To GND	V_I = 0.5V,	S54S140 N74S140	2			V
V_{OL}	Low-level output voltage	V_{CC} = MIN, I_{OL} = 60mA	V_{IH} = 2V,				0.5	V
I_I	Input current at maximum input voltage	V_{CC} = MAX,	V_I = 5.5V				1	mA
I_{IH}	High-level input current (each input)	V_{CC} = MAX,	V_I = 2.7V				100	μA
I_{IL}	Low-level input current (each input)	V_{CC} = MAX,	V_I = 0.5V				-4	mA
I_{OS}	Short-circuit output current†	V_{CC} = MAX			-50		-225	mA
I_{CCH}	Supply current, high-level output (average per gate)	V_{CC} = MAX,	All inputs at 0V			5	9	mA
I_{CCL}	Supply current, low-level output (average per gate)	V_{CC} = MAX,	All inputs at 5V			12.5	22	mA

NOTES:

A. The pulse generator has the following characteristics: $V_{in(1)}$ = 3V, $V_{in(0)}$ = 0V, $t_1 = t_0$ = 2.5ns, PRR = 1 MHz, duty cycle = 50%, and $Z_{out} \approx 50\Omega$.

B. Inputs not under test are at 2.7V.

C. C_L includes probe and jig capacitance.

SWITCHING CHARACTERISTICS, V_{CC} = 5V, T_A = 25°C, N = 30

	PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	C_L = 50pF,	R_L = 93Ω	2	4	6.5	ns
		C_L = 150pF,	R_L = 93Ω		6		ns
t_{PHL}	Propagation delay time, high-to-low-level output	C_L = 50pF,	R_L = 93Ω	2	4	6.5	ns
		C_L = 150pF,	R_L = 93Ω		6		ns

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable series on the second page of this section.

** All typical values are at V_{CC} = 5V, T_A = 25°C.

† Not more than one output should be shorted at a time, and duration of the short-circuit test should not exceed 100 milliseconds.