

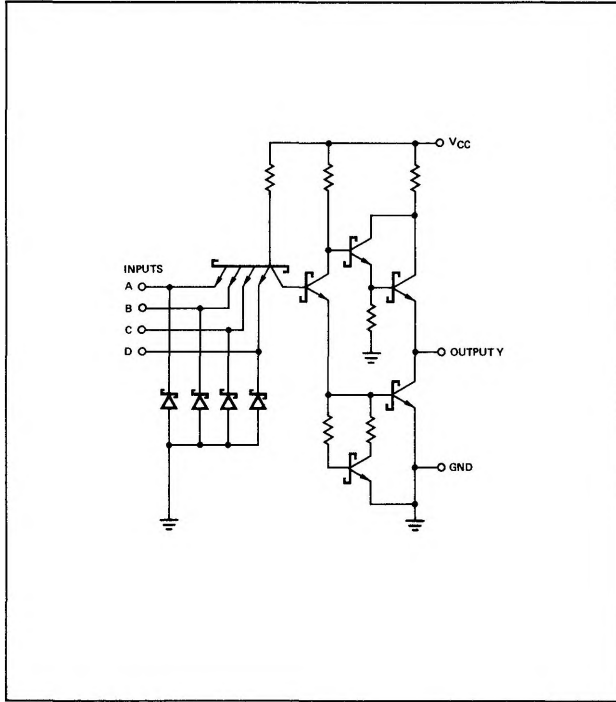
DUAL 4-INPUT POSITIVE-NAND BUFFERS/LINE DRIVERS

S54S40
S54S140
N74S40
N74S140

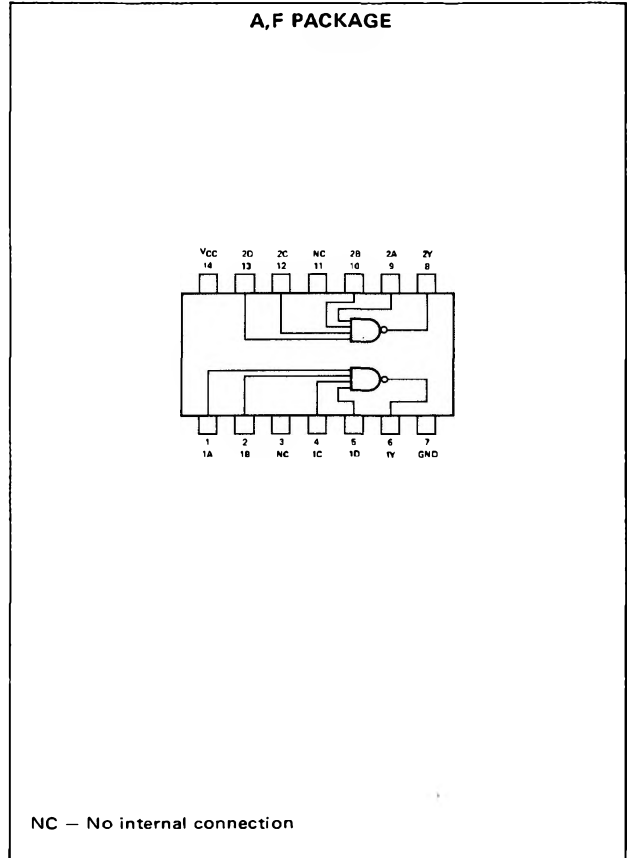
S54S40-A,F,W • S54S140-A,F,W • N74S40-A,F • N74S140-A,F

DIGITAL 54/74 TTL SERIES

SCHEMATIC (each gate)



PIN CONFIGURATIONS



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

NOTES:

- The pulse generator has the following characteristics: $V_{in(1)} = 3\text{V}$, $V_{in(0)} = 0\text{V}$, $t_1 = t_0 = 2.5\text{ns}$, $\text{PRR} = 1\text{MHz}$, duty cycle = 50%, and $Z_{out} \approx 50\Omega$.
- Inputs not under test are at 2.7V.
- C_L includes probe and jig capacitance.

SIGNETICS DIGITAL 54/74 TTL SERIES - S54S40 • S54S140 • N74S40 • N74S140

SWITCHING CHARACTERISTICS, $V_{CC} = 5V$, $T_A = 25^\circ C$, $N = 30$

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 $V_{CC} = 5V$, $T_A = 25^\circ C$.

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