

OPEN COLLECTOR POSITIVE-NAND GATE

S54S00

S54S03

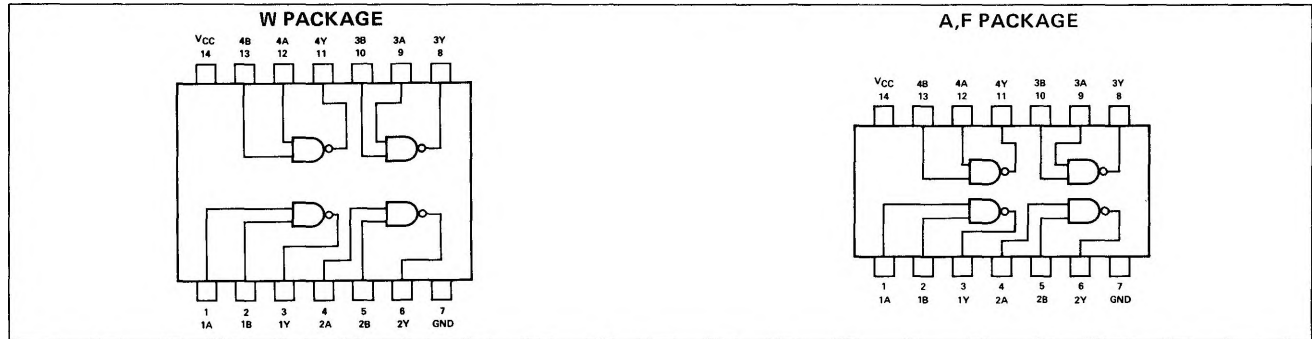
N74S00

N74S03

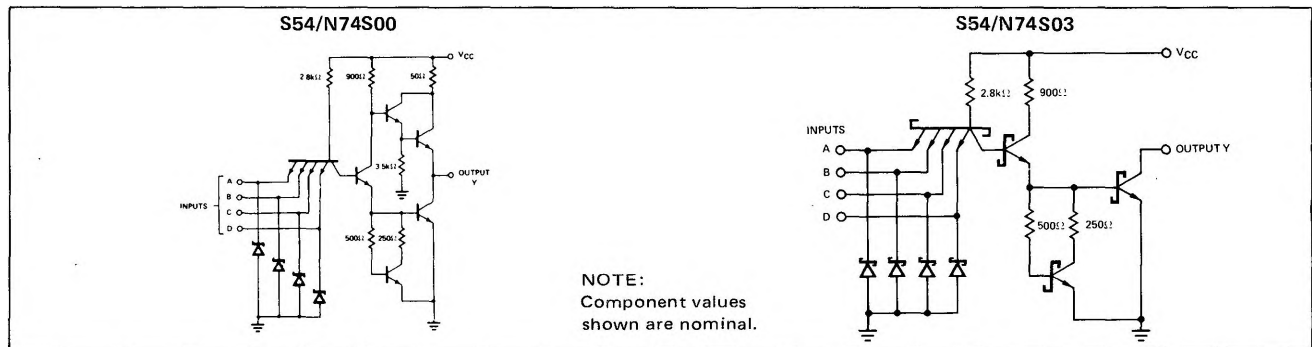
S54S00/503—A,F • N74S00/503—A,F

DIGITAL 54/74 TTL SERIES

PIN CONFIGURATIONS



SCHEMATIC (each gate)



RECOMMENDED OPERATING CONDITIONS

	S54S00			N74S00			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply Voltage V_{CC}	4.5	5	5.5	4.75	5	5.25	V
Normalized Fan-Out from each Output, N:							
High logic level			20			20	
Low logic level			10			10	
Operating Free-Air Temperature, T_A	-55		125	0		70	°C

ELECTRICAL CHARACTERISTICS (over recommended 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
	$V_{CC} = \text{MIN}, V_{IL} = 0.8\text{V},$ Series 54S	2.5	3.4		V
	$I_{OH} = -1\text{mA}$ Series 74S	2.7	3.4		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V},$			0.5	V
	$I_{OL} = 20\text{mA}$				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)	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$			50	μA
I_{IL} Low-level input current (each input)	$V_{CC} = \text{MAX}, V_I = 0.5\text{V}$			-2	mA
I_{OS} Short-circuit output current†	$V_{CC} = \text{MAX}$	-40		-100	mA
I_{CCH} Supply current, high-level output (average per gate)	$V_{CC} = \text{MAX},$ All inputs at 0V		2.5	4	mA
I_{CCL} Supply current, low-level output (average per gate)	$V_{CC} = \text{MAX},$ All inputs at 5V		5	9	mA

SIGNETICS DIGITAL 54/74 TTL SERIES — S54S00 • N74S00 • S54S03 • N74S03
SWITCHING CHARACTERISTICS, $V_{CC} = 5V$, $T_A = 25^\circ C$, $N = 10$

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 15pF$, $R_L = 280\Omega$		2	3	4.5	ns
		$C_L = 50pF$, $R_L = 280\Omega$			4.5		
t_{PHL}	Propagation delay time, high-to-low-level output	$C_L = 15pF$, $R_L = 280\Omega$		2	3	5	ns
		$C_L = 50pF$, $R_L = 280\Omega$			5		

S54/N74S03
ELECTRICAL CHARACTERISTICS (over recommended 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	$V_{CC} = \text{MIN}$, $V_{CC} = \text{MIN}$, $V_{OH} = 5.5V$	$I_I = -18mA$, $V_{IL} = 0.8V$,			-1.2	V
I_{OH}	High-level output current	$V_{CC} = \text{MIN}$, $I_{OL} = 20mA$	$V_{IH} = 2V$,			250	μA
V_{OL}	Low-level output voltage					0.5	V
I_I	Input current at maximum input voltage	$V_{CC} = \text{MAX}$,	$V_I = 5.5V$			1	mA
I_{IH}	High-level input current (each input)	$V_{CC} = \text{MAX}$,	$V_I = 2.7V$			50	μA
I_{IL}	Low-level input current (each input)	$V_{CC} = \text{MAX}$,	$V_I = 0.5V$			-2	mA
I_{CCH}	Supply current, high-level output (average per gate)	$V_{CC} = \text{MAX}$,	All inputs at 0V		1.5	3.3	mA
I_{CCL}	Supply current, low-level output (average per gate)	$V_{CC} = \text{MAX}$,	All inputs at 5V		5	9	mA

SWITCHING CHARACTERISTICS, $V_{CC} = 5V$, $T_A = 25^\circ C$, $N = 10$

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 15pF$, $C_L = 50pF$,	$R_L = 280\Omega$, $R_L = 280\Omega$	2	5	7.5	ns
		$C_L = 15pF$, $C_L = 50pF$,	$R_L = 280\Omega$, $R_L = 280\Omega$	2	4.5	7	ns

* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

** 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 one second.

NOTES:

A. The pulse generator has the following characteristics: $V_{in(1)} = 3V$, $V_{in(0)} = 0V$, $t_1 = t_0 = 2.5ns$, $PRR = 1 \text{ MHz}$, 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.