

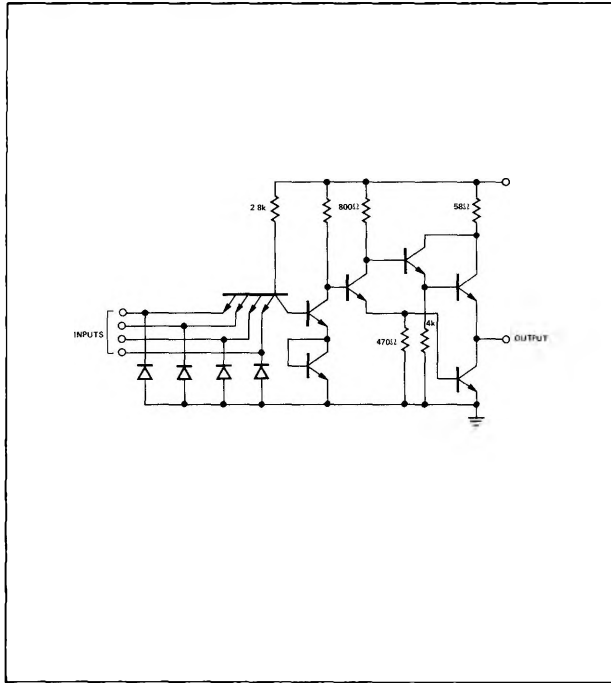
DUAL 4-INPUT POSITIVE AND GATE

S54H21 N74H21

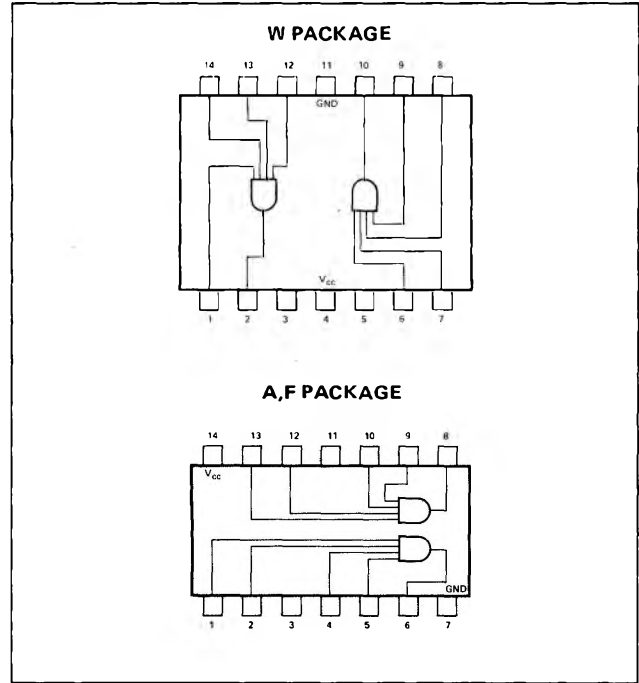
S54H21-A,F,W • N74H21-A,F

DIGITAL 54/74 TTL SERIES

SCHMATIC (each gate)



PIN CONFIGURATIONS



RECOMMENDED OPERATING CONDITIONS

Supply Voltage V_{CC} : S54H21 Circuits N74H21 Circuits	MIN	NOM	MAX	UNIT
	4.5	5	5.5	V
Normalized Fan-Out from each Output, N	4.75	5	5.25	V
Operating Free-Air Temperature Range, T_A : S54H21 Circuits N74H21 Circuits	-55	25	125	$^{\circ}\text{C}$
	0	25	70	$^{\circ}\text{C}$

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

PARAMETER		TEST CONDITIONS*		MIN	TYP**	MAX	UNIT
$V_{in(1)}$	Logical 1 input voltage required at all input terminals to ensure logical 1 level at output	$V_{CC} = \text{MIN},$		2			V
$V_{in(0)}$	Logical 0 input voltage required of any input terminal to ensure logical 0 level at output	$V_{CC} = \text{MIN},$				0.8	V
$V_{out(1)}$	Logical 1 output voltage	$V_{CC} = \text{MIN},$ $I_{load} = -500\mu\text{A}$	$V_{in(1)} = 2\text{V},$	2.4			V
$V_{out(0)}$	Logical 0 output voltage	$V_{CC} = \text{MIN},$ $I_{sink} = 20\text{mA}$	$V_{in(0)} = 0.8\text{V},$			0.4	V
$I_{in(0)}$	Logical 0 level input current (each input)	$V_{CC} = \text{MAX},$	$V_{in} = 0.4\text{V}$			-2	mA
$I_{in(1)}$	Logical 1 level input current (each input)	$V_{CC} = \text{MAX},$ $V_{CC} = \text{MAX},$	$V_{in} = 2.4\text{V},$ $V_{in} = 5.5\text{V}$			50 1	μA mA
I_{OS}	Short circuit output current†	$V_{CC} = \text{MAX},$	$V_{in} = 4.5\text{V}$	-40		-100	mA
$I_{CC(0)}$	Logical 0 level supply current	$V_{CC} = \text{MAX},$	$V_{in} = 0$		20	32	mA
$I_{CC(1)}$	Logical 1 level supply current	$V_{CC} = \text{MAX},$	$V_{in} = 4.5\text{V}$		12	20	mA

SIGNETICS DIGITAL 54/74 TTL SERIES – S54H21 • N74H21

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

PARAMETER		TEST CONDITIONS		MIN	TYP**	MAX	UNIT
t_{pd0}	Propagation delay time to logical 0 level	$C_L = 25pF$,	$R_L = 280\Omega$		8.8	12	ns
t_{pd1}	Propagation delay time to logical 1 level	$C_L = 25pF$,	$R_L = 280\Omega$		7.6	12	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 short circuit test should not exceed 1 second.