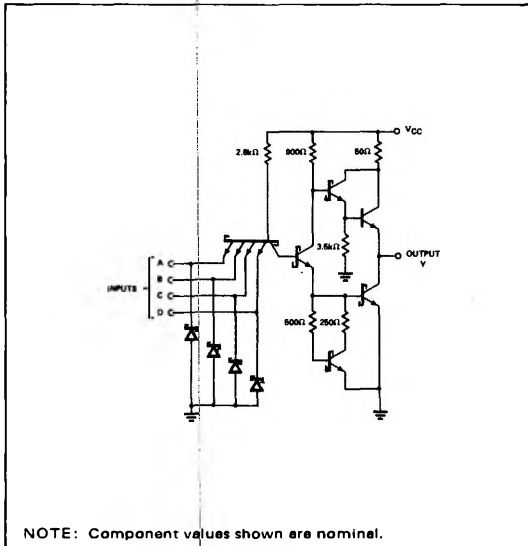


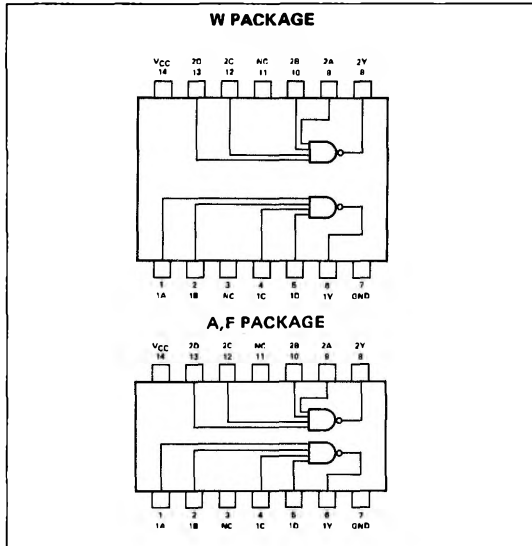
S54S20-A,F,W • N74S20-A,F

DIGITAL 54/74 TTL SERIES

SCHEMATIC (each gate)



PIN CONFIGURATIONS



RECOMMENDED OPERATING CONDITIONS

	S54S20			N74S20			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:			20			20	
High logic level			10			10	
Low logic level			125			70	
Operating Free-Air Temperature, T_A	-55			0			°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	$V_{CC} = \text{MIN}, I_I = -18\text{mA}$		-1.2	V	
V_{OH}	High-level output voltage	$V_{CC} = \text{MIN}, I_{OH} = -1\text{mA}$	Series 54S: 2.5 Series 74S: 2.7	3.4	V	
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}, I_{OL} = 20\text{mA}$		0.5	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	mA	
ICCH	Supply current, high-level output (average per gate)	$V_{CC} = \text{MAX},$ All inputs at 0V		2.5	4	mA
ICCL	Supply current, low-level output (average per gate)	$V_{CC} = \text{MAX},$ All inputs at 5V		5	9	mA

DIGITAL 54/74 TTL SERIES ■ S54S20, N74S20

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	$C_L = 15pF$,	$R_L = 280\Omega$	NOTE 1	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		

* 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.

NOTE 1: Load circuits and waveforms are shown on page 2-293