

5402/7402 Quadruple 2-Input Positive-NOR Gate

	Schottky TTL				High-Speed TTL				Low-Power Schottky TTL				Standard TTL				Low-Power TTL				
	Device Type	Package			Device Type	Package			Device Type	Package			Device Type	Package			Device Type	Package			
		C	P	M	CF		C	P	M	CF		C	P	M	CF		C	P	M	CF	
T. I.	SN54S02 SN74S02	J	1	W							SN54LS02 SN74LS02	J	1	W			SN5402 SN7402	J	1	W	
FAIRCHILD	FMS402/FM502 F07402/F0902	06		06							FMS402/FM502 F07402/F0902	06		06			FMS402/FM502 F07402/F0902	06		06	
MOTOROLA											SN74LS02	P					MC5402 MC7402	L			
N. S. C.											DM54LS02 DM74LS02						DM5402 DM7402	J	1	W	
PHILIPS	N74S02										N74LS02						FJH221-7402				
SIGNETICS	N74S02										N74LS02						S5402 N7402	F	1	W	
SIEMENS																	FI H151				
FUJITSU											74LS02						MB417				
HITACHI	HD74S02										HD74LS02						HD7402-HD2511				
mitsubishi											M74LS02						M53202				
NEC																	μPB232				
TOSHIBA																	TD3402A				

Electrical Characteristics SN54LS02 SN74LS02

absolute maximum ratings over operating free-air temperature range

Supply voltage V_{CC}	5V	Operating free-air temperature range	SN54LS	55°C to 125°C
Input voltage	5V	temperature range	SN74LS	0°C to 100°C
Storage temperature range				
-65°C to 150°C				

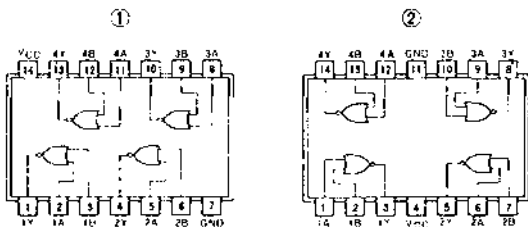
recommended operating conditions

	SN54LS02			SN74LS02			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current I_{OH}			-400			400	mA
Low-level output current I_{OL}			4			8	mA
Operating free-air temperature T_A	0	25	0	0	25	70	°C

electrical characteristics over recommended operating free-air temperature range

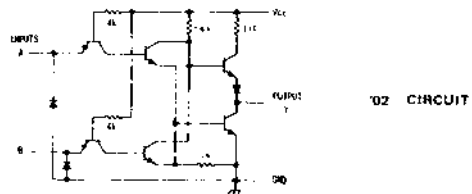
PARAMETER	TEST CONDITIONS †	MIN	TYP ‡	MAX	UNIT
V_{OH} High-level output voltage			2		V
V_{OL} Low-level output voltage				0.8	V
V_I Input clamp voltage	V_{CC} MIN, $I_I = 18$ mA			1.5	V
V_{OH} High-level output voltage	V_{CC} MIN, $V_{IH} = V_I$ max, I_{OH} MAX	2.7	3.4		V
V_{OL} Low-level output voltage	V_{CC} MIN, $V_{IH} = 2V$, $I_{OL} = 4$ mA		0.25	0.4	V
I_I Input current at maximum input voltage	V_{CC} MAX, $V_I = 5V$			0.1	mA
I_{IH} High-level input current	Data inputs, V_{CC} MAX, $V_{IH} = 2.7V$			20	μA
I_{IL} Low-level input current	Data inputs, V_{CC} MAX, $V_{IL} = 0.4V$			0.4	mA
I_{OS} Short-circuit output current	V_{CC} MAX, 54LS Family, 74LS Family		20	100	mA
I_{CC} Supply current	V_{CC} MAX, Data inputs high		6	3.2	mA
I_{CCL} Supply current	V_{CC} MAX, Total outputs low		2.8	5.4	mA
I_{CC} Supply current	$V_{CC} = 5V$, Average per gate (50% duty cycle)		0.55		mA
t_{PLH} Propagation delay time low to high level output	$V_{CC} = 5V$, $T_A = 25°C$		10	15	ns
t_{PHL} Propagation delay time high to low level output	$C_L = 15pF$, $R_L = 2kΩ$		10	15	ns

Pin Assignments (Top View)

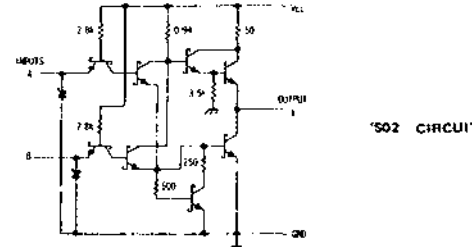


positive logic.
Y = A · B

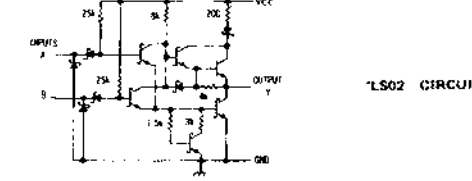
Schematics (each gate)



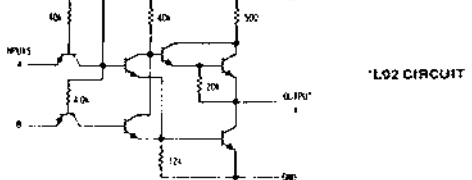
'02' CIRCUIT



'S02' CIRCUIT



'LS02' CIRCUIT



'L02' CIRCUIT

Resistor values shown are nominal and in ohms

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ A typical value is at $V_{CC} = 5V$, $T_A = 25°C$.
• Not more than one output should be shorted at a time, and for SN54S, SN74S duration of a fault short-circuit should not exceed one second.