

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			
		C	P	M	CF		C	P	M	CF		C	P	M	CF		C	P	M	CF
T. I.	SN54S02	J ①			W ①						SN54LS02	J ①			W ①					
	SN74S02	J ①	N ①								SN74LS02	J ①	N ①							
FAIRCHILD	FMS4502 / FM9502	D ①			F ①						FMS4LS02 / FM9LS02	D ①			F ①					
	FC74S02 / FC9502	D ①	P ①		F ①						FC74LS02 / FC9LS02	D ①	P ①		F ①					
MOTOROLA											SN74LS02	P ①								
N. S. C.											DM54LS02	J ①	N ①		W ②		DM54L02	J ①	N ①	F ②
											DM74LS02	J ①	N ①				DM74L02	J ①	N ①	F ②
PHILIPS																				
	N74S02		①								N74LS02		①				FJH221/7402		①	
SIGNETICS																	S5402	F ①	A ①	W ②
	N74S02	A ①									N74LS02	A ①					N7402	F ①	A ①	
SIEMENS																	FLH191		①	
FUJITSU																				
											74LS02	M ①					MB417	①	M ①	
HITACHI											HD74LS02	P ①					HD7402/HD7511	①	P ①	
MITSUBISHI																				
	HD74S02	P ①									M74LS02	P ①					M53202		P ①	
NEC																	μPB232	D ①	C ①	
TOSHIBA																	TD3402A		P ①	

Electrical Characteristics SN54LS02/SN74LS02

absolute maximum ratings over operating free-air temperature range

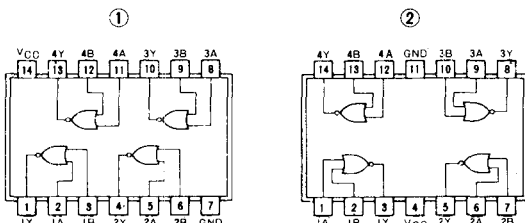
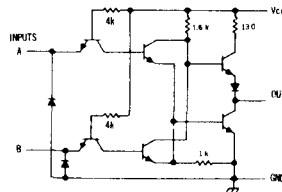
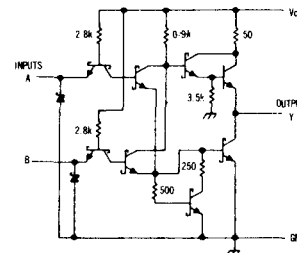
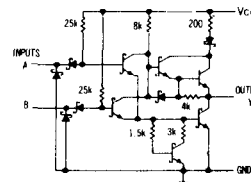
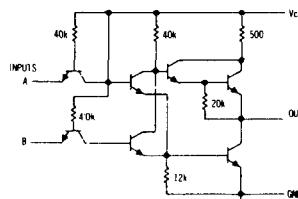
Supply voltage, V_{CC}	7V	Operating free-air temperature range	SN54LS	-55°C to 125°C
Input voltage	7V	Storage temperature range	SN74LS	-65°C to 150°C

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	μA
Low-level output current, I_{OL}			4			8	mA
Operating free-air temperature, T_A	-55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range

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	$V_{CC} = \text{MIN.}$, $I_I = -18 \text{ mA}$			-1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN.}$, $I_{OH} = \text{MAX.}$, $V_{IL} = V_{IL} \text{ max.}$	2.7	3.4		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN.}$, $I_{OL} = 4 \text{ mA}$, $V_{IH} = 2 \text{ V.}$	0.25	0.4		V
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX.}$, $V_I = 7 \text{ V}$		0.1		mA
I_{IH} High-level input current	Data inputs, $V_{CC} = \text{MAX.}$, $V_{IH} = 2.7 \text{ V}$		20		μA
I_{IL} Low-level input current	Data inputs, $V_{CC} = \text{MAX.}$, $V_{IL} = 0.4 \text{ V}$		0.4		mA
I_{OS} Short-circuit output current◆	$V_{CC} = \text{MAX.}$	54LS Family	-20	-100	mA
		74LS Family	-20	-100	mA
I_{CCH} Supply current	$V_{CC} = \text{MAX.}$	Total, outputs high	1.6	3.2	mA
I_{CCL} Supply current		Total, outputs low	2.8	5.4	mA
I_{CC} Supply current	$V_{CC} = 5 \text{ V}$	Average per gate (50% duty cycle)	0.55		mA
t_{PLH} Propagation delay time, low-to-high-level output	$V_{CC} = 5 \text{ V.}$, $T_A = 25^\circ \text{C.}$		10	15	ns
t_{PHL} Propagation delay time, high-to-low-level output	$C_L = 15 \text{ pF.}$, $R_L = 2 \text{ k}\Omega$		10	15	ns

Pin Assignments (Top View)

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.

 ‡ All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ \text{C}$.

◆ Not more than one output should be shorted at a time, and for SN54S02/SN74S02, duration of output short-circuit should not exceed one second.