5452/7452 Expandable 4-Wide AND-OR 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		C	P	M	CF
T.I.						SN54H52	J①			W②															
						SN74H52	J①	N①																	
FAIRCHILD						FM54H52/FM9H52	D①			F②															
						FC74H52/FC9H52	D①	P①																	
MOTOROLA						MC3131	L①			F①															
						MC3031	L①	P①		F①															
N.S.C.						DM54H52	J①	N①																	
						DM74H52	J①	N①																	
PHILIPS						N74H52		①																	
SIGNETICS						S54H52	F①	A①		W②															
						N74H52	F①	A①																	
SIEMENS																									
FUJITSU																									
HITACHI																									
MITSUBISHI																									
NEC																									
TOSHIBA																									

Electrical Characteristics SN54H52/SN74H52

absolute maximum ratings over operating free-air temperature range

Supply voltage, V_{CC}	7V	Operating free-air temperature range	SN54'	−55°C to 125°C
Input voltage	5.5V		SN74'	0°C to 70°C
Interemitter voltage	5.5V	Storage temperature range		−65°C to 150°C

recommended operating conditions

	SN54H52			SN74H52			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}			−500			−500	μA
Low-level output current, I_{OL}			20			20	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}=MIN,	I_I=−8mA			−1.5	V
V_{OH}	High-level output voltage		V_{CC}=MIN,	V_{IH}=2V, I_{OH}=MAX	2.4	3.4		V
V_{OL}	Low-level output voltage		V_{CC}=MIN,	V_{IL}=V_{IL}max, I_{OL}=MAX		0.2	0.4	V
I_I	Input current at maximum input voltage		V_{CC}=MAX,	V_I=5.5V			1	mA
I_{IH}	High-level input current	Data input	V_{CC}=MIX,	V_{IH}=2.4V			50	μA
I_{IL}	Low-level input current	Data inputs	V_{CC}=MAX,	V_{IL}=0.4V			−2	mA
I_{OS}	Short-circuit output current		V_{CC}=MAX		−40		−100	mA
I_{CCH}	Supply current		V_{CC}=MAX	Total, outputs high		20	31	mA
I_{CCL}	Supply current			Total, outputs low		15.2	24	mA
I_{CC}	Supply current		V_{CC}=5V	Average per gate (50%duty cycle)		17.6		mA
t_{PLH}	Propagation delay time, low-to-high-level output		V_{CC}=5V, T_A=25°C,	Expander pins open		10.6	15	ns
				C=15pF (GND to x)		14.8		
t_{PHL}	Propagation delay time, high-to-low-level output		C_L=25pF, R_L=280Ω	Expander pins open		9.2	15	ns
				C=15pF(GND to x)		9.8		
I_X	expander current	expander inputs	V_{CC}=MIN, T_A=MIN,	V_X=1V, I_{OH}=−500μA,	−2.7		4.5	mA
V_{OH}	High-level output voltage	expander inputs	V_{CC}MIN, T_A=MIN,	V_x=1V, I_{OH}=−500μA,	2.4	3.4		V
V_{OL}	Low-level output voltage,	expander inputs	V_{CC}=MIN, T_A=MAX,	I_X=−300μA, I_{OL}=20mA,		0.2	0.4	V

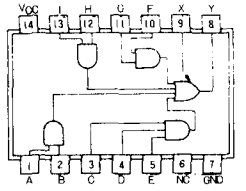
Pin Assignments (Top View)

'H52(J, N) ①

positive logic:

Y=AB+CDE+FG+HI+X

X=output of SN54H61/SN74H61

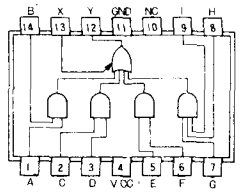


'H52(W) ②

positive logic:

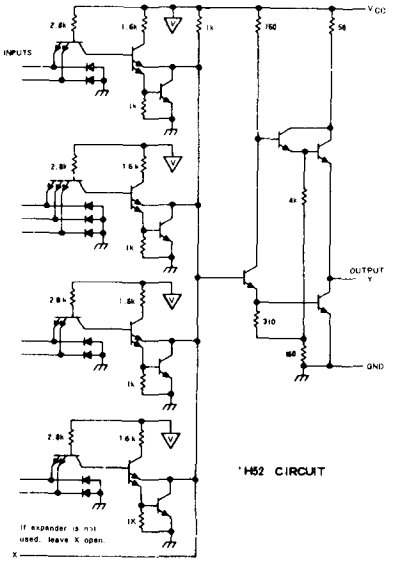
Y=AB+CD+EF+GHI+X

X=output of SN54H61/SN74H61



NC=No internal connection

Schematic (each gate)



'H52 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}=5V, T_A=25°C.

◆ Not more than one output should be shorted at a time, and for the SN54H'/SN74H', duration of short-circuit should not exceed one second.