

5438 / 7438 Quadruple 2-Input Positive-NAND Buffer with Open-Collector Output

	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	MCF		C	P	MCF		C	P	MCF		C	P	MCF		C	P	MCF
T.I.	SN54S38	J	W					SN54LS38	J	W		SN5438	J	W						
	SN74S38	J	W					SN74LS38	J	W		SN7438	J	W						
FAIRCHILD								FM54LS38 / FM9LS38	D	F		FM5438 / FM9N38	D	F						
								FC74LS38 / FC9LS38	D	F		FC7438 / FC9N38	D	F						
MOTOROLA																				
N.S.C.								SN74LS38	P			MC7438	P							
								DM54LS38				DM5438	J	W						
								DM74LS38				DM7438	J	W						
PHILIPS																				
	N74S38							N74LS38				N7438								
SIGNETICS												S5438	F	W						
	N74S38							N74LS38	A			N7438	F	W						
SIEMENS												FLH541								
FUJITSU								74LS38	M			MB433	M							
HITACHI								HD74LS38	P			HD7438 / HD2544	P							
MITSUBISHI																				
								M53LS38	P			M53238	P							
NEC								74LS38	C			μPB238	D							
TOSHIBA												TD7438	P							

Electrical Characteristics SN54LS38/SN74LS38

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		SN74LS	0°C to 70°C
Intermitter voltage	5.5V	Storage temperature range		-65°C to 150°C

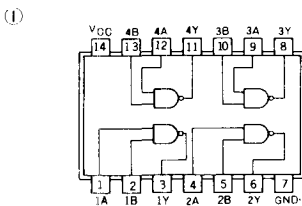
recommended operating conditions

	SN54LS38			SN74LS38			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 voltage, V _{OH}			5.5			5.5	V
Low-level output current, I _{OL}			12			24	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 = -18 mA		-1.5	V	
I _{OH}	High-level output current	V _{CC} = MIN, V _{IL} = V _{IL} max, V _{OH} = MAX		250	μA	
V _{OL}	Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 12 mA	0.25	0.4	V	
I _I	Input current at maximum input voltage	V _{CC} = MAX, V _I = 7V	0.1		mA	
I _{IH}	High-level input current	V _{CC} = MAX, V _{IH} = 2.7V	20		μA	
I _{IL}	Low-level input current	V _{CC} = MAX, V _{IL} = 0.4V		-0.4	mA	
I _{CC} H	Supply current	V _{CC} = MAX	Total, outputs high	0.9	2	mA
I _{CC} L	Supply current		Total, outputs low	6	12	mA
I _{CC}	Supply current	V _{CC} = 5 V	Average per gate (50% duty cycle)	0.86		mA
t _{PLH}	Propagation delay time, low-to-high-level output	V _{CC} = 5 V, T _A = 25°C, C _L = 45 pF, R _L = 667Ω	20	32	ns	
t _{PHL}	Propagation delay time, high-to-low-level output		18	28	ns	

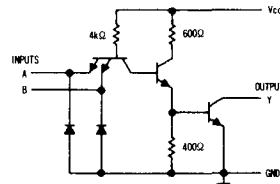
Pin Assignment (Top View)



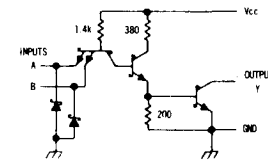
Positive Positive logic :

$Y = \overline{AB}$

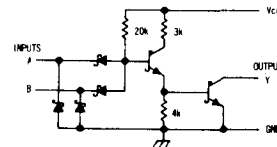
Schematic (each gate)



'38 CIRCUIT



'S38 CIRCUIT



'LS38 CIRCUIT

Resistor values shown are nominal and in ohms.

† For conditions shown as MIN or MAX, use appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.