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	M	CF		C	P	M	CF		C	P	M	CF		C	P	M	CF		C	P	M	CF
T.I.	SN54S38	J ①			W ①						SN54LS38	J ①			W ①	SN5438	J ①			W ①					
	SN74S38	J ①	N ①								SN74LS38	J ①	N ①			SN7438	J ①	N ①							
FAIRCHILD											FM54LS38/FM9LS38	D ①			F ①	FM5438/FM9N38	D ①			F ①					
											FC74LS38/FC9LS38	D ①	P ①		F ①	FC7438/FC9N38	D ①	P ①							
MOTOROLA											SN74LS38		P ①			MC7438		P ①							
N.S.C.											DM54LS38		①			DM5438	J ①	N ①		W ①					
											DM74LS38		①			DM7438	J ①	N ①		W ①					
PHILIPS	N74S38		①								N74LS38		①			N7438		①							
SIGNETICS																S5438	F ①	A ①		W ①					
	N74S38										N74LS38		A ①			N7438	F ①	A ①							
SIEMENS																FLH541		①							
FUJITSU											74LS38		M ①			MB433	①	M ①							
HITACHI											HD74LS38		P ①			HD7438/HD2544	①	P ①							
MITSUBISHI											M53LS38		P ①			M53238		P ①							
NEC											74LS38		C ①			μPB238	D ①								
TOSHIBA																TD7438		P ①							

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
Interemitter voltage	5.5V	Storage temperature range		−65°C	to	150°C

recommended operating conditions

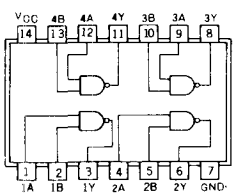
	SN54LS38			SN74LS38			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output voltage, V_{OH}			5.5			5.5	V
Low-level output current, I_{OL}			12			24	mA
Operating free-air temperature, T_A	−55		125	0		70	°C

electrical characteristics over recommended operating free-air temperate 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=−18mA				−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}=2V, I_{OL}=12mA			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_{CCH}	Supply current	V_{CC}=MAX	Total, outputs high		0.9	2	mA
I_{CCL}	Supply current		Total, outputs low		6	12	mA
I_{CC}	Supply current	V_{CC}=5V	Average per gate (50% duty cycle)		0.86		mA
t_{PLH}	Propagation delay time, low-to-high-level output	V_{CC}=5V, T_A=25°C,			20	32	ns
t_{PHL}	Propagation delay time, high-to-low-level output	C_L=45pF, R_L=667Ω			18	28	ns

Pin Assignment (Top View)

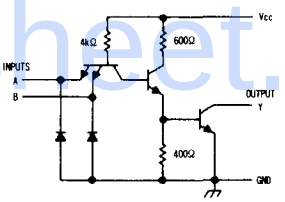
(1)



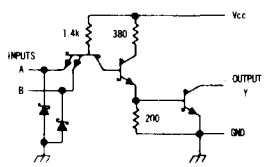
Positive Positive logic :

$Y=\overline{AB}$

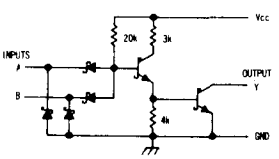
Schematic (each gate)



'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}=5V, T_A=25°C.

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