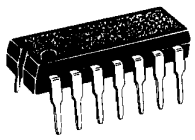
MN4030B/S, MN4070B/S

Quad Exclusive-OR Gates

■ Description

The MN4030B/S and MN4070B/S are EXCLUSIVE-OR gates and have 4 circuits in a package.
The outputs are fully buffered to improve the propagation characteristics between the input and output which are affected by increasing load capacitance and minimizes propagation delay time. Their primary use is where low power dissipation and/or high noise immunity is desired.
Typical applications include digital comparators and parity checkers.
These are equivalent to MOTOROLA MC14070B and RCA CD4070B.

P-1



14-Pin • Plastic DIL Package

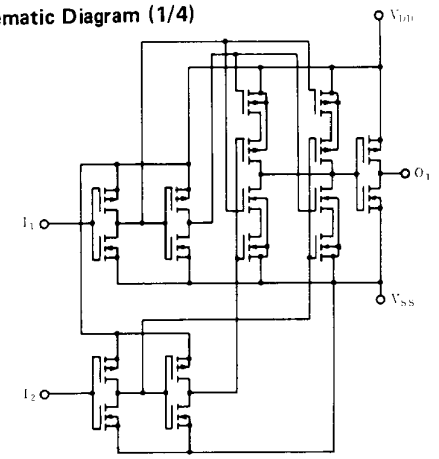
P-2

14-Pin • Panaflat Package (SO-14D)

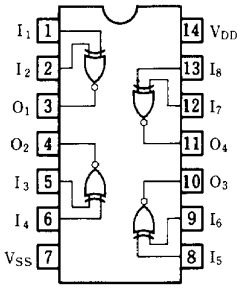
■ Truth Table

I_1	I_2	O_1
L	L	L
H	L	H
L	H	H
H	H	L

■ Schematic Diagram (1/4)



Pin Configuration



■ Maximum Ratings (Ta=25℃)

Item		Symbol	Ratings	Unit
Supply Voltage		V_{DD}	−0.5~+18	V
Input Voltage		V_I	−0.5~V_{DD}+0.5*	V
Output Voltage		V_O	−0.5~V_{DD}+0.5*	V
Peak Input · Output Current		$\pm I_I$	max. 10	mA
Power Dissipation (per package)	Ta=−40~+60℃	P_D	max. 400	mW
	Ta=+60~+85℃		Decrease up to 200mW rating at 8mW/°C	
Power Dissipation (per output terminal)		P_D	max. 100	mW
Operating Ambient Temperature		Topr	−40~+85	℃
Storage Temperature		Tstg	−65~+150	℃

* V_{DD} + 0.5V should be under 18V

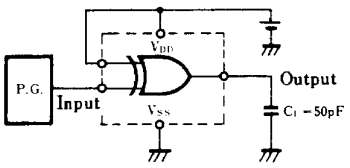
■ DC Characteristics (V_{SS}=0V)

Item	V_{DD} (V)	Symbol	Conditions		Ta=−40℃ min.	Ta=−40℃ max.	Ta=25℃ min.	Ta=25℃ max.	Ta=85℃ min.	Ta=85℃ max.	Unit
Quiescent Power Supply Current	5	I_{DD}	V_I=V_{SS} or V_{DD}		—	1	—	1	—	7.5	μA
	10				—	2	—	2	—	15	
	15				—	4	—	4	—	30	
Output Voltage Low Level	5	V_{OL}	V_I=V_{SS} or V_{DD}		—	0.05	—	0.05	—	0.05	V
	10		$\|I_O\|$<1μA		—	0.05	—	0.05	—	0.05	
	15				—	0.05	—	0.05	—	0.05	
Output Voltage High Level	5	V_{OH}	V_I=V_{SS} or V_{DD}		4.95	—	4.95	—	4.95	—	V
	10		$\|I_O\|$<1μA		9.95	—	9.95	—	9.95	—	
	15				14.95	—	14.95	—	14.95	—	
Input Voltage Low Level	5	V_{IL}	$\|I_O\|$<1μA	V_O=0.5V or 4.5V	—	1.5	—	1.5	—	1.5	V
	10			V_O=1V or 9V	—	3	—	3	—	3	
	15			V_O=1.5V or 13.5V	—	4	—	4	—	4	
Input Voltage High Level	5	V_{IH}	$\|I_O\|$<1μA	V_O=0.5V or 4.5V	3.5	—	3.5	—	3.5	—	V
	10			V_O=1V or 9V	7	—	7	—	7	—	
	15			V_O=1.5V or 13.5V	11	—	11	—	11	—	
Output Current Low Level	5	I_{OL}	V_O=0.4V, V_I=0 or 5V		0.52	—	0.44	—	0.36	—	mA
	10		V_O=0.5V, V_I=0 or 10V		1.3	—	1.1	—	0.9	—	
	15		V_O=1.5V, V_I=0 or 15V		3.6	—	3	—	2.4	—	
Output Current High Level	5	$-I_{OH}$	V_O=4.6V, V_I=0 or 5V		0.52	—	0.44	—	0.36	—	mA
	10		V_O=9.5V, V_I=0 or 10V		1.3	—	1.1	—	0.9	—	
	15		V_O=13.5V, V_I=0 or 15V		3.6	—	3	—	2.4	—	
Output Current High Level	5	$-I_{OH}$	V_O=2.5V, V_I=0 or 5V		1.7	—	1.4	—	1.1	—	mA
Input Leakage Current	15	$\pm I_I$	V_I=0 or 15V		—	0.3	—	0.3	—	1	μA

■ Switching Characteristics (Ta=25℃, V_{SS}=0V, C_L=50pF)

Item	V_{DD} (V)	Symbol	min.	typ.	max.	Unit
Output Rise Time	5	t_{TLH}	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Output Fall Time	5	t_{THL}	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Propagation Delay Time	5	t_{PLH}	—	75	225	ns
	10		—	30	90	
	15		—	25	75	
Propagation Delay Time	5	t_{PHL}	—	85	255	ns
	10		—	35	105	
	15		—	30	90	
Input Capacitance		C_I	—	—	7.5	pF

1. Switching Time Test Circuit



2. Waveforms