

## CD4030C Quad EXCLUSIVE-OR Gate

### General Description

The CD4030C EXCLUSIVE-OR gates are monolithic complementary MOS (CMOS) integrated circuits constructed with N- and P-channel enhancement mode transistors. All inputs are protected against static discharge with diodes to  $V_{DD}$  and  $V_{SS}$ .

### Features

- Wide supply voltage range: 3.0V to 15V
- Low power: 100 nW (typ.)
- Medium speed operation:

$t_{PHL} = t_{PLH} = 40$  ns (typ.) at  $C_L = 15$  pF, 10V supply

- High noise immunity 0.45  $V_{CC}$  (typ.)

### Applications

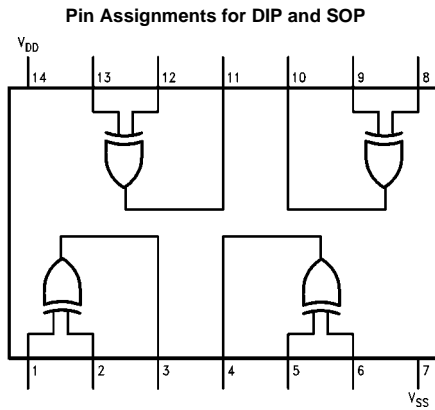
- Automotive
- Data terminals
- Instrumentation
- Medical electronics
- Industrial controls
- Remote metering
- Computers

### Ordering Code:

Order Number	Package Number	Package Description
CD4030CSJ	M14D	14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
CD4030CN	N14A	14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

### Connection Diagram

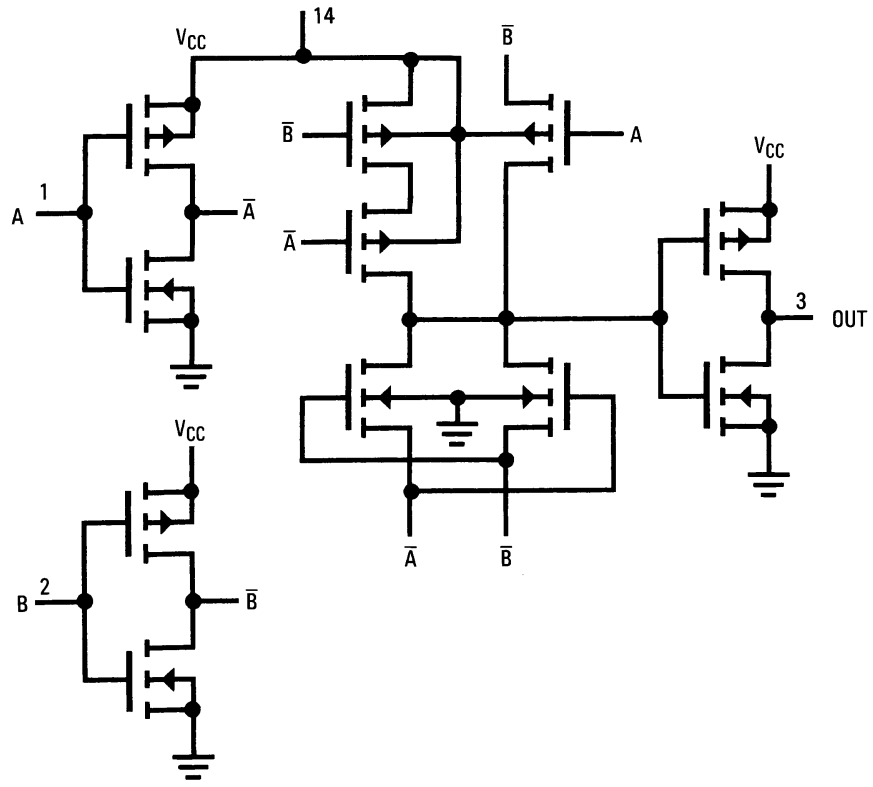


### Truth Table

A	B	J
0	0	0
1	0	1
0	1	1
1	1	0

1 = HIGH Level  
0 = LOW Level

Logic Diagram



**Absolute Maximum Ratings**(Note 1)

Voltage at Any Pin (Note 2)	$V_{SS} - 0.3V$ to $V_{SS} + 15.5V$
Operating Temperature Range	$-40^{\circ}C$ to $+85^{\circ}C$
Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$
Power Dissipation ( $P_D$ )	
Dual-In-Line	700 mW
Small Outline	500 mW
Operating $V_{DD}$ Range	$V_{SS} + 3.0V$ to $V_{SS} + 15V$

Lead Temperature

(Soldering, 10 seconds)

260°C

**Note 1:** "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The Electrical Characteristics tables provide conditions for actual device operation.

**Note 2:** This device should not be connected to circuits with power on because high transient voltages may cause permanent damage.

**DC Electrical Characteristics**

Symbol	Parameter	Conditions	Limits									Units
			$-40^{\circ}C$			$+25^{\circ}C$			$+85^{\circ}C$			
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_L$	Quiescent Device Current	$V_{DD} = 5.0V$			5.0		0.05	5.0			70	$\mu A$
		$V_{DD} = 10V$			10		0.1	10			140	$\mu A$
$P_D$	Quiescent Device Dissipation Package	$V_{DD} = 5.0V$			25		0.25	25			350	$\mu W$
		$V_{DD} = 10V$			100		1.0	100			1,400	$\mu W$
$V_{OL}$	Output Voltage LOW Level	$V_{DD} = 5.0V$			0.05		0	0.05			0.05	V
		$V_{DD} = 10V$			0.05		0	0.05			0.05	V
$V_{OH}$	Output Voltage HIGH Level	$V_{DD} = 5.0V$	4.95			4.95	5.0		4.95			V
		$V_{DD} = 10V$	9.95			9.95	10		9.95			V
$V_{NL}$	Noise Immunity (All Inputs)	$V_{DD} = 5.0V$	1.5			1.5	2.25		1.4			V
		$V_{DD} = 10V$	3.0			3.0	4.5		2.9			V
$V_{NH}$	Noise Immunity (All Inputs)	$V_{DD} = 5.0V$	1.4			1.5	2.25		1.5			V
		$V_{DD} = 10V$	2.9			3.0	4.5		3.0			V
$I_{DN}$	Output Drive Current N-Channel (Note 3)	$V_{DD} = 5.0V$	0.35			0.3	1.2		0.25			mA
		$V_{DD} = 10V$	0.7			0.6	2.4		0.5			mA
$I_{DP}$	Output Drive Current P-Channel (Note 3)	$V_{DD} = 5.0V$	-0.21			-0.15	-0.6		-0.12			mA
		$V_{DD} = 10V$	-0.45			-0.32	-1.3		-0.25			mA
$I_I$	Input Current	$V_I = 0V$ or $V_I = V_{DD}$					10					pA

**Note 3:**  $I_{DN}$  and  $I_{DP}$  are tested one output at a time.

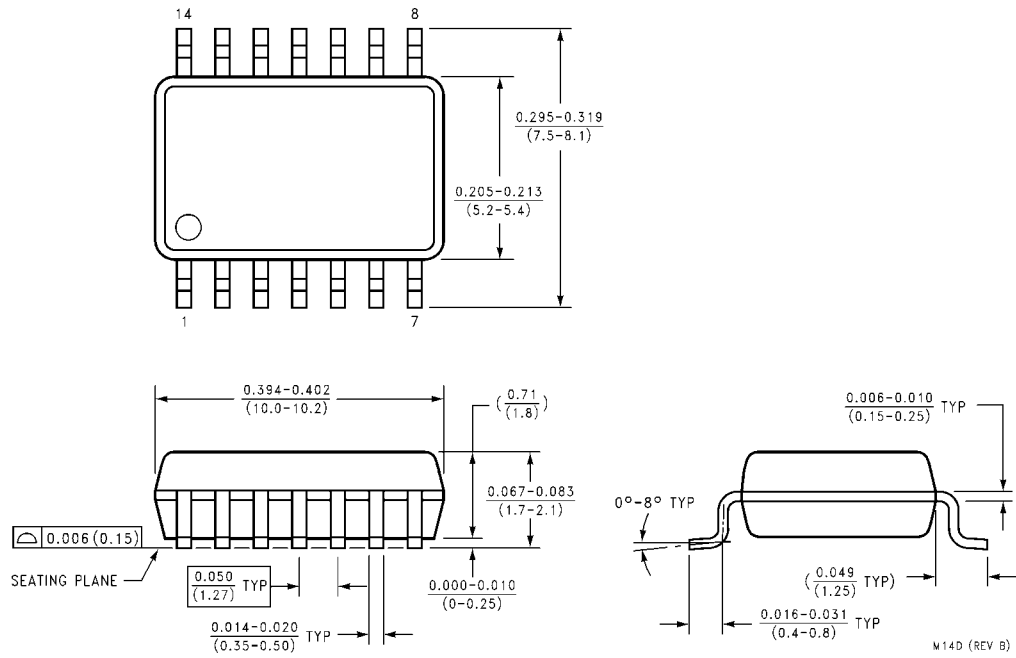
**AC Electrical Characteristics** (Note 4)

Symbol	Parameter	Conditions	Limits			Units
			Min	Typ	Max	
$t_{PHL}$	Propagation Delay Time	$V_{DD} = 5.0V$		100	300	ns
		$V_{DD} = 10V$		40	150	ns
$t_{PLH}$	Propagation Delay Time	$V_{DD} = 5.0V$		100	300	ns
		$V_{DD} = 10V$		40	150	ns
$t_{THL}$	Transition Time HIGH-to-LOW Level	$V_{DD} = 5.0V$		70	300	ns
		$V_{DD} = 10V$		25	150	ns
$t_{TLH}$	Transition Time LOW-to-HIGH Level	$V_{DD} = 5.0V$		80	300	ns
		$V_{DD} = 10V$		30	150	ns
$C_I$	Input Capacitance	$V_I = 0V$ or $V_I = V_{DD}$		5.0		pF

**Note 4:** AC Parameters are guaranteed by DC correlated testing.

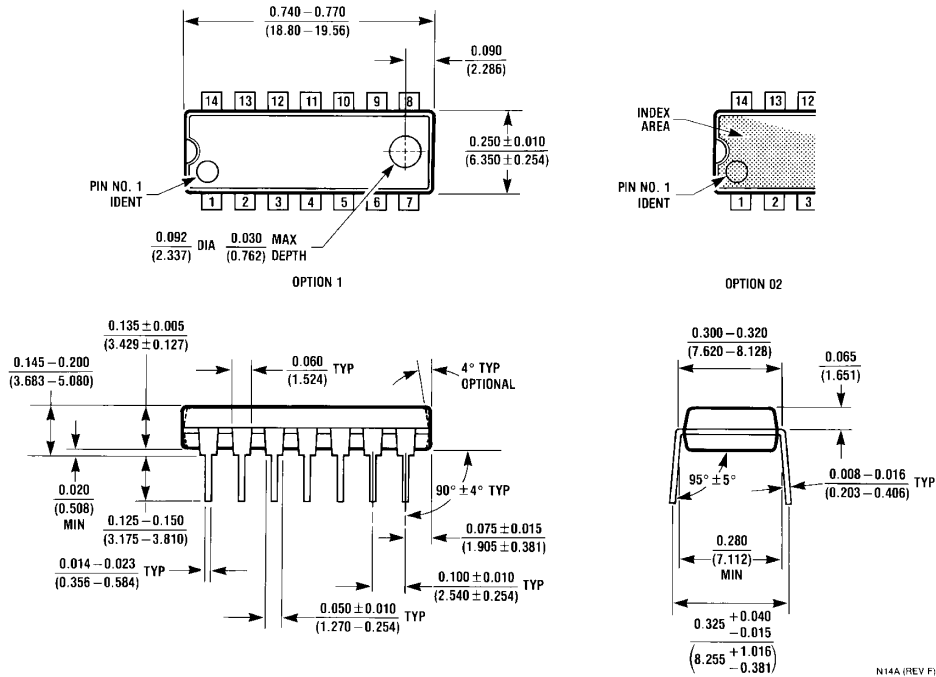
CD4030C

**Physical Dimensions** inches (millimeters) unless otherwise noted



**14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide  
Package Number M14D**

**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



**14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide Package Number N14A**

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