

CD4010C Hex Buffers (Non-Inverting)

General Description

The CD4010C hex buffers are monolithic complementary MOS (CMOS) integrated circuits. The N- and P-channel enhancement mode transistors provide a symmetrical circuit with output swings essentially equal to the supply voltage. This results in high noise immunity over a wide supply voltage range. No DC power other than that caused by leakage current is consumed during static conditions. All inputs are protected against static discharge. These gates may be used as hex buffers, CMOS to DTL or TTL interface or as CMOS current drivers. Conversion ranges are from 3V to 15V providing $V_{CC} \leq V_{DD}$. The devices also have buffered outputs which improve transfer characteristics by providing very high gain.

Features

- Wide supply voltage range: 3.0V to 15V
- Low power: 100 nW (typ.)
- High noise immunity: $0.45 V_{DD}$ (typ.)
- High current sinking: 8 mA (min.) at $V_O = 0.5V$ capability: and $V_{DD} = 10V$

Applications

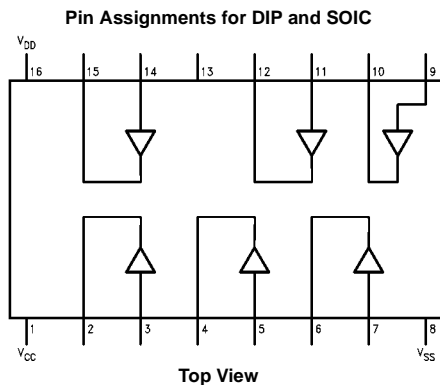
- Automotive
- Data terminals
- Instrumentation
- Medical electronics
- Alarm system
- Industrial controls
- Remote metering
- Computers

Ordering Code:

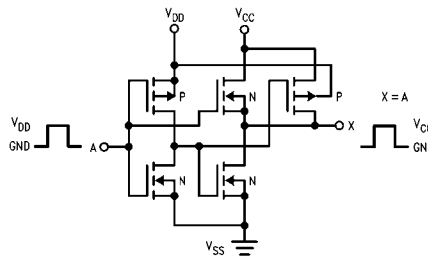
Order Number	Package Number	Package Description
CD4010CM	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
CD4010CN	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

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

Connection Diagram



Schematic Diagram



Hex COS/MOS to DTL or TTL converter (inverting).
Connect V_{CC} to DTL or TTL supply.
Connect V_{DD} to COS/MOS supply.

Absolute Maximum Ratings(Note 1)

Voltage at Any Pin (Note 2)	$V_{SS} - 0.3V$ to $V_{SS} + 15.5V$
Operating Temperature Range	$-45^{\circ}C$ to $+85^{\circ}C$
Storage Temperature Range (T_S)	$-65^{\circ}C$ to $+150^{\circ}C$
Power Dissipation (P_D)	
Dual-In-Line	700 mW
Small Outline	500 mW
Lead Temperature (T_L)	
(Soldering, 10 seconds)	260 $^{\circ}C$
Operating Range (V_{DD})	$V_{SS} + 3V$ to $V_{SS} + 15V$

Note 1: "Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits."

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

DC Electrical Characteristics

Symbol	Characteristics	Test Conditions (Volts)		Limits						Units	
				$-40^{\circ}C$		$+25^{\circ}C$			$+85^{\circ}C$		
		V_O	V_{DD}	Min	Max	Min	Typ	Max	Min		Max
I_{CC}	Quiescent Device		5		3		0.03	3		42	μA
	Current		10		5		0.05	5		70	μA
P_D	Quiescent Device		5		15		0.15	15		210	μW
	Dissipation/Package		10		50		0.5	50		700	μW
V_{OL}	Output Voltage		5		0.01		0	0.01		0.05	V
	LOW Level		10		0.01		0	0.01		0.05	V
V_{OH}	HIGH Level		5	4.99		4.99	5		4.95		V
			10	9.99		9.99	10		9.95		V
V_{NL}	Noise Immunity (All Inputs)	$V_O \geq 1.5$	5	1.6		1.5	2.25		1.4		V
		$V_O \geq 3.0$	10	3.2		3	4.5		2.9		V
		$V_O \geq 3.5$	5	1.4		1.5	2.25		1.5		V
		$V_O \geq 7.0$	10	2.9		3	4.5		3		V
I_{DN}	Output Drive Current N-Channel (Note 3)	0.4	5	3.6		3			2.4		mA
		0.5	10	9.6		8			6.4		mA
		2.5	5	-1.5		-1.25			-1		mA
		9.5	10	-0.72		-0.6			-0.48		mA
I_{IN}	Input Current						10				pA

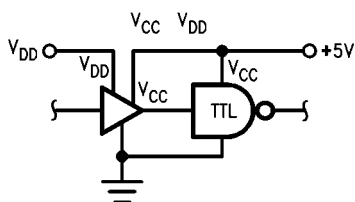
Note 3: I_{DN} and I_{DP} are tested one output at a time.

AC Electrical Characteristics (Note 4)
 $T_A = 25^\circ\text{C}$, $C_L = 15\text{ pF}$, unless otherwise noted. Typical Temperature coefficient for all values of $V_{DD} = 0.3\%/^\circ\text{C}$

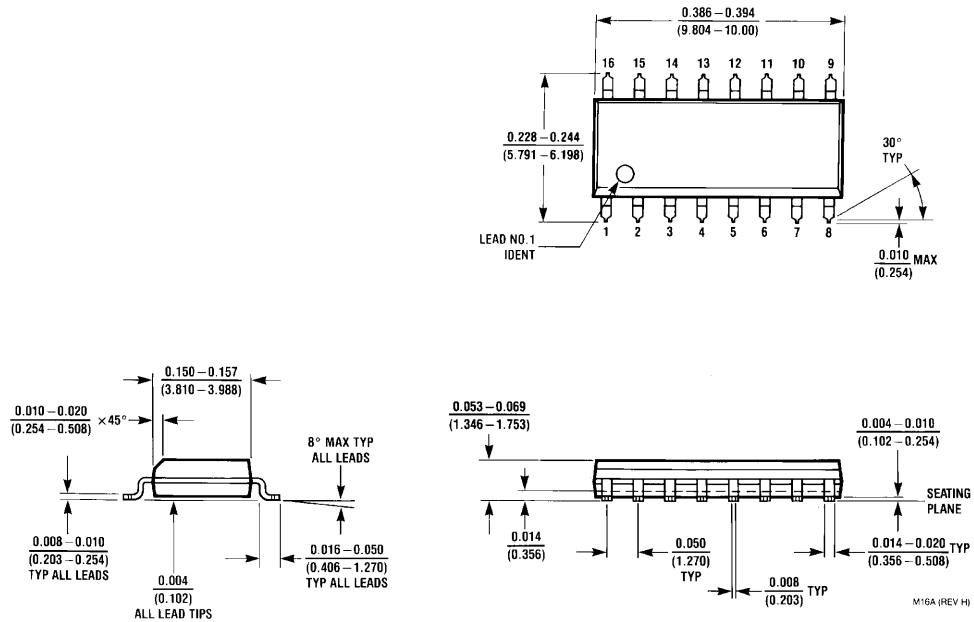
Symbol	Characteristics	Test Conditions		Limits			Units
			V_{DD} (Volts)	Min	Typ	Max	
t_{PHL}	Propagation Delay Time: HIGH-to-LOW Level (t_{PHL})	$V_{CC} = V_{DD}$	5	—	15	70	ns
t_{PLH}		$V_{DD} = 10\text{V}$ $V_{CC} = 5\text{V}$	10	—	10	40	
	LOW-to-HIGH Level (t_{PLH})	$V_{CC} = V_{DD}$	5	—	50	100	ns
		$V_{DD} = 10\text{V}$ $V_{CC} = 5\text{V}$	10	—	25	70	
t_{THL}	Transition Time: HIGH-to-LOW Level (t_{THL})	$V_{CC} = V_{DD}$	5	—	20	60	ns
t_{TLH}		$V_{CC} = V_{DD}$	10	—	16	50	
	LOW-to-HIGH Level (t_{TLH})	$V_{CC} = V_{DD}$	5	—	80	160	ns
	Input Capacitance (C_I)	Any Input	10	—	50	120	pF
				—	5	—	

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

Typical Application

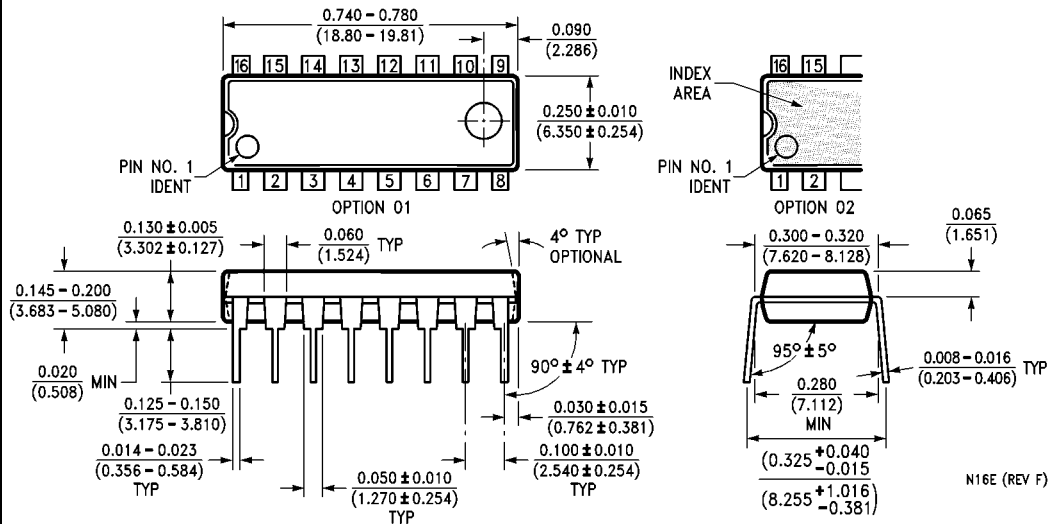


Physical Dimensions inches (millimeters) unless otherwise noted



**16-Line Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
Package Number M16A**

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



**16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide
Package Number N16E**

N16E (REV F)

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

www.fairchildsemi.com

This datasheet has been downloaded from:

www.DatasheetCatalog.com

Datasheets for electronic components.



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.