FAIRCHILD SEMICONDUCTOR™

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DM7416
Hex Inverting Buffers with High Voltage Open-Collector Outputs

General Description

This device contains six independent gates each of which performs the logic INVERT function. The open-collector outputs require external pull-up resistors for proper logical operation.

Pull-Up Resistor Equations

$$R_{MAX} = \frac{V_O\,(Min) - V_{OH}}{N_1\,(I_{OH}) + N_2\,(I_{IH})}$$

$$R_{MIN} = \frac{V_O\,(Max) - V_{OL}}{I_{OL} - N_3\,(I_{IL})}$$

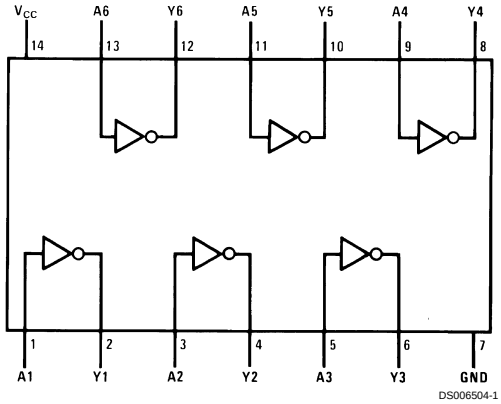
Where: $N_1\,(I_{OH})$ = total maximum output high current for all outputs tied to pull-up resistor

$N_2\,(I_{IH})$ = total maximum input high current for all inputs tied to pull-up resistor

$N_3\,(I_{IL})$ = total maximum input low current for all inputs tied to pull-up resistor

Connection Diagram

Dual-In-Line Package



Order Number DM5416J, DM5416W or DM7416N
See Package Number J14A, N14A or W14B

Function Table

$Y = \overline{A}$

Input	Output
A	Y
L	H
H	L

H = High Logic Level
L = Low Logic Level

Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Output Voltage	15V

Operating Free Air Temperature Range	
DM54	−55˚C to +125˚C
DM74	0˚C to +70˚C
Storage Temperature Range	−65˚C to +150˚C

Recommended Operating Conditions

Symbol	Parameter	DM5416			DM7416			Units
		Min	Nom	Max	Min	Nom	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			2			V
V_{IL}	Low Level Input Voltage			0.8			0.8	V
V_{OH}	High Level Output Voltage			15			15	V
I_{OL}	Low Level Output Current			30			40	mA
T_A	Free Air Operating Temperature	−55		125	0		70	˚C

Note 1: *The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.*

Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −12 mA			−1.5	V
I_{CEX}	High Level Output Current	V_{CC} = Min, V_O = 15V V_{IL} = Max			250	µA
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max V_{IH} = Min			0.7	V
		I_{OL} = 16 mA, V_{CC} = Min			0.4	
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 5.5V			1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.4V			40	µA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V			−1.6	mA
I_{CCH}	Supply Current with Outputs High	V_{CC} = Max		30	48	mA
I_{CCL}	Supply Current with Outputs Low	V_{CC} = Max		27	51	mA

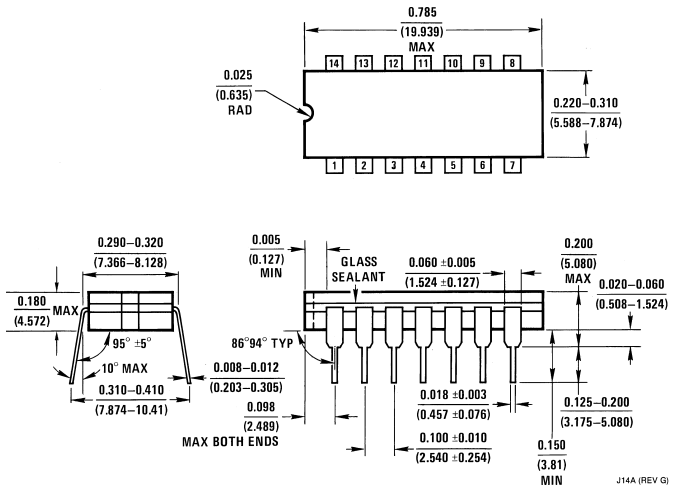
Switching Characteristics

at V_{CC} = 5V and T_A = 25˚C

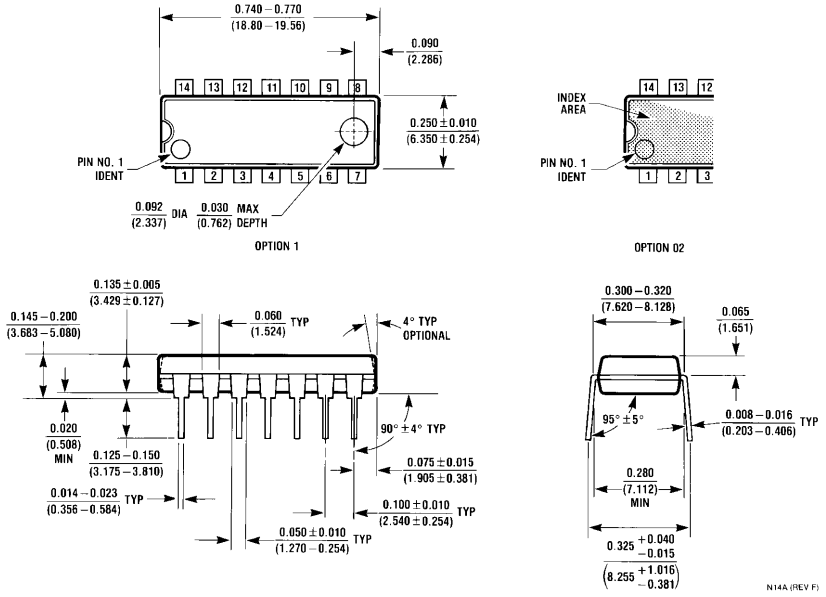
Symbol	Parameter	Conditions	Min	Max	Units
t_{PLH}	Propagation Delay Time Low to High Level Output	C_L = 15 pF R_L = 110Ω		15	ns
t_{PHL}	Propagation Delay Time High to Low Level Output			23	ns

Note 2: All typicals are at V_{CC} = 5V, T_A = 25˚C.

Physical Dimensions inches (millimeters) unless otherwise noted

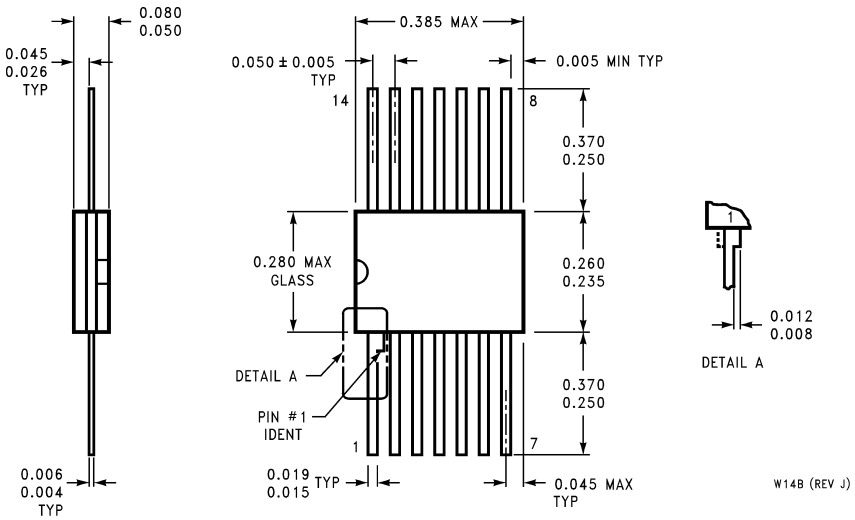


14-Lead Ceramic Dual-In-Line Package (J)
Order Number DM5416J
Package Number J14A



14-Lead Molded Dual-In-Line Package (N)
Order Number DM7416N
Package Number N14A

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



14-Lead Ceramic Flat Package (W)
Order Number DM5416W
Package Number W14B

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