

# DM7414

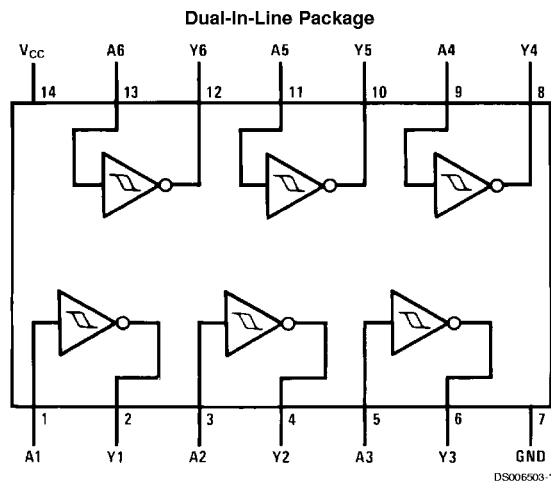
## Hex Inverter with Schmitt Trigger Inputs

### General Description

This device contains six independent gates each of which performs the logic INVERT function. Each input has hysteresis

which increases the noise immunity and transforms a slowly changing input signal to a fast changing, jitter free output.

### Connection Diagram



Order Number DM5414J, DM5414W or DM7414N  
See Package Number J14A, N14A or W14B

### Function Table

$$Y = \bar{A}$$

Input	Output
A	Y
L	H
H	L

H = High Logic Level  
L = Low Logic Level

## Absolute Maximum Ratings (Note 1)

Supply Voltage	7V	DM54	-55°C to +125°C
Input Voltage	5.5V	DM74	0°C to +70°C
Operating Free Air Temperature Range		Storage Temperature Range	-65°C to +150°C

## Recommended Operating Conditions

Symbol	Parameter	DM5414			DM7414			Units
		Min	Nom	Max	Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V <sub>T+</sub>	Positive-Going Input Threshold Voltage (Note 2)	1.5	1.7	2	1.5	1.7	2	V
V <sub>T-</sub>	Negative-Going Input Threshold Voltage (Note 2)	0.6	0.9	1.1	0.6	0.9	1.1	V
HYS	Input Hysteresis (Note 2)	0.4	0.8		0.4	0.8		V
I <sub>OH</sub>	High Level Output Current			-0.8			-0.8	mA
I <sub>OL</sub>	Low Level Output Current			16			16	mA
T <sub>A</sub>	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 3)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -12 mA			-1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max V <sub>I</sub> = V <sub>T-,Min</sub>	2.4	3.4		V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max V <sub>I</sub> = V <sub>T+,Max</sub>		0.2	0.4	V
I <sub>T+</sub>	Input Current at Positive-Going Threshold	V <sub>CC</sub> = 5V, V <sub>I</sub> = V <sub>T+</sub>		-0.43		mA
I <sub>T-</sub>	Input Current at Negative-Going Threshold	V <sub>CC</sub> = 5V, V <sub>I</sub> = V <sub>T-</sub>		-0.56		mA
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5V			1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.4V			40	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V			-1.2	mA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max				mA
		(Note 4)	DM54	-18		-55
			DM74	-18		-55
I <sub>CCH</sub>	Supply Current with Outputs High	V <sub>CC</sub> = Max		22	36	mA
I <sub>CCL</sub>	Supply Current with Outputs Low	V <sub>CC</sub> = Max		39	60	mA

**Note 2:** V<sub>CC</sub> = 5V

**Note 3:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

**Note 4:** Not more than one output should be shorted at a time.

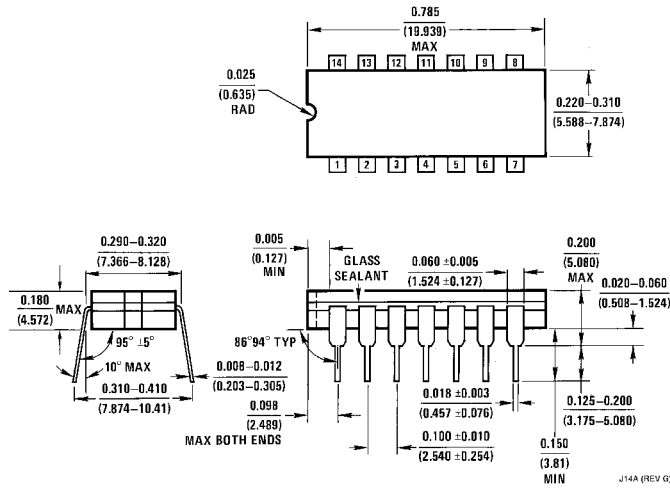
### Switching Characteristics

at  $V_{CC} = 5V$  and  $T_A = 25^{\circ}C$  (for Test Waveforms and Output Load)

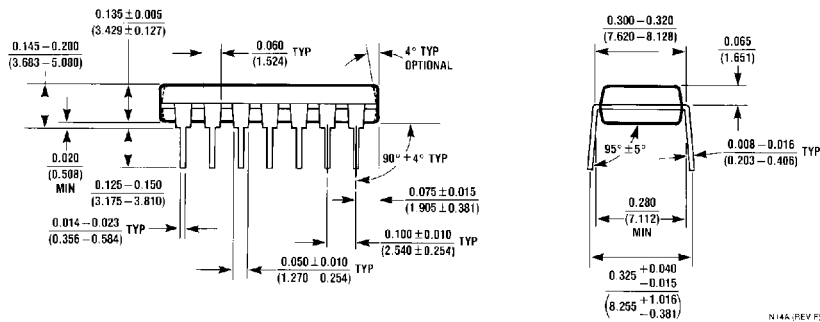
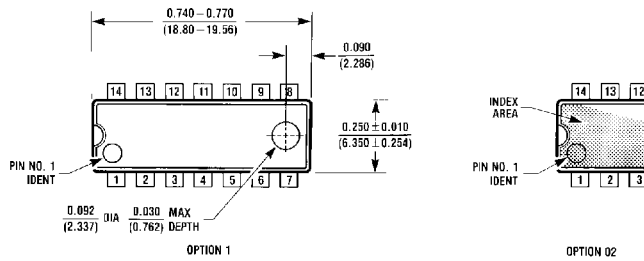
Symbol	Parameter	Conditions	Min	Max	Units
$t_{PLH}$	Propagation Delay Time Low to High Level Output	$C_L = 15\text{ pF}$ $R_L = 400\Omega$		22	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output			22	ns



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

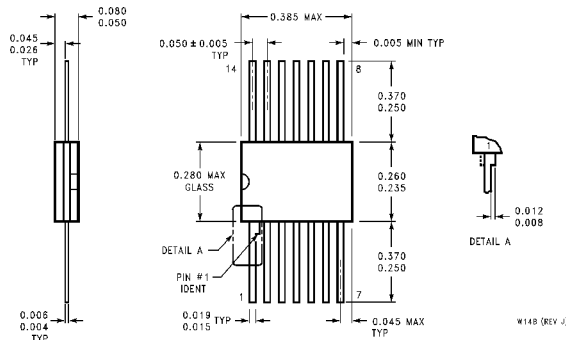


**14-Lead Ceramic Dual-In-Line Package (J)**  
**Order Number DM5414J**  
**Package Number J14A**



**14-Lead Molded Dual-In-Line Package (N)**  
**Order Number DM7414N**  
**Package Number N14A**

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



**14-Lead Ceramic Flat Package (W)**  
**Order Number DM5414W**  
**Package Number W14B**

W14B (REV J)

**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.

**Fairchild Semiconductor Corporation Americas**  
 Customer Response Center  
 Tel: 1-888-522-5372

**Fairchild Semiconductor Europe**  
 Fax: +49 (0) 1 80-530 85 86  
 Email: europe.support@nsc.com  
 Deutsch Tel: +49 (0) 8 141-35-0  
 English Tel: +44 (0) 1 793-85-68-56  
 Italy Tel: +39 (0) 2 57 5631

**Fairchild Semiconductor Hong Kong Ltd.**  
 13th Floor, Straight Block,  
 Ocean Centre, 5 Canton Rd.  
 Tsimshatsui, Kowloon  
 Hong Kong  
 Tel: +852 2737-7200  
 Fax: +852 2314-0061

**National Semiconductor Japan Ltd.**  
 Tel: 81-3-5620-6175  
 Fax: 81-3-5620-6179

[www.fairchildsemi.com](http://www.fairchildsemi.com)