

December 1986 Revised February 2000

DM7407

Hex Buffers with High Voltage Open-Collector Outputs

General Description

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

Pull-Up Resistor Equations

$$R_{MAX} = \frac{V_{O} \text{ (Min)} - V_{OH}}{N_{1} \text{ (I}_{OH}) + N_{2} \text{ (I}_{IH})}$$

$$\mathsf{R}_{\mathsf{MIN}} = \frac{\mathsf{V}_{\mathsf{O}}\left(\mathsf{Max}\right) - \mathsf{V}_{\mathsf{OL}}}{\mathsf{I}_{\mathsf{OL}} - \mathsf{N}_{\mathsf{3}}\left(\mathsf{I}_{\mathsf{IL}}\right)}$$

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

 $N_3 \ (I_{IL}) = total \ maximum \ input \ low \ current \ for$

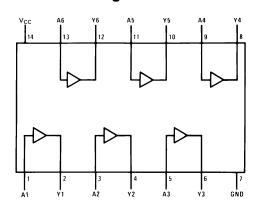
all inputs tied to pull-up resistor

Ordering Code:

Order Number	Package Number	Package Description				
DM7407M	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow				
DM7407N	N14A	14-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



Function Table

H = HIGH Logic Level L = LOW Logic Level

Absolute Maximum Ratings(Note 1)

7V Supply Voltage 5.5V Input Voltage Output Voltage 30V Operating Free Air Temperature Range 0°C to $+70^{\circ}\text{C}$

 $-65^{\circ}C$ to $+150^{\circ}C$

Storage Temperature Range

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 tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	Min	Nom	Max	Units
V _{CC}	Supply Voltage	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			V
V _{IL}	Low Level Input Voltage			0.8	V
V _{ОН}	High Level Output Voltage			30	V
OL	Low Level Output Current			40	mA
T _A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

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

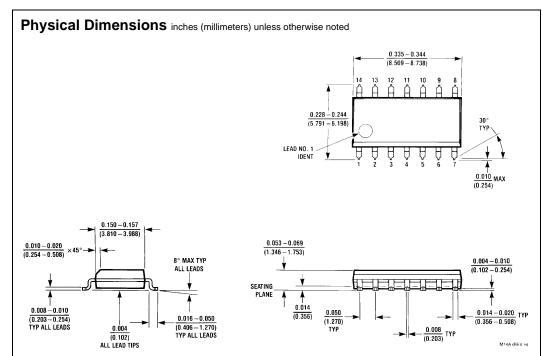
Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
VI	Input Clamp Voltage	$V_{CC} = Min, I_I = -12 \text{ mA}$			-1.5	V
I _{CEX}	HIGH Level Output Current	$V_{CC} = Min, V_O = 30V$ $V_{IH} = Min$			250	μА
V _{OL}	LOW Level Output Voltage	$V_{CC} = Min, I_{OL} = Max$ $V_{IL} = Max$			0.7	٧
	Land Owner & Manufact Vallage	I _{OL} = 16 mA, V _{CC} = Min			0.4	A
Ц	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	μΑ
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		29	41	mA
I _{CCL}	Supply Current with Outputs LOW	V _{CC} = Max		21	30	mA

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

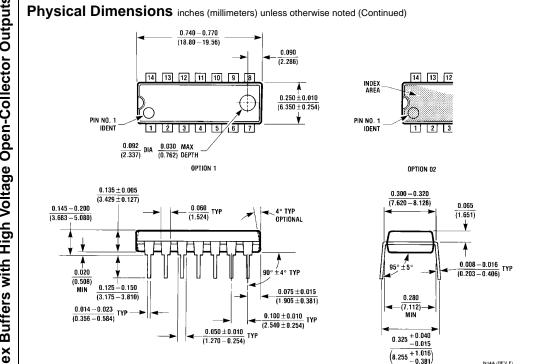
Switching Characteristics

at $V_{CC} = 5V$ and $T_A = 25^{\circ}C$

Symbol	Parameter	Conditions	Min	Max	Units
t _{PLH}	Propagation Delay Time	C _L = 15 pF		10	ns
	LOW-to-HIGH Level Output	$R_L = 110\Omega$			
t _{PHL}	Propagation Delay Time			30	ns
	HIGH-to-LOW Level Output			30	115



14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow Package Number M14A



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

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