

DM7405

Hex Inverters with 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.

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

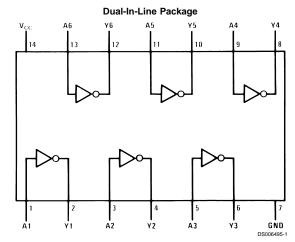
 $\rm N_3~(I_{\rm IL})$ = total maximum input low current for all inputs tied to pull-up resistor

Pull-Up Resistor Equations

$$\mathsf{R}_{\mathsf{MAX}} = \frac{\mathsf{V}_{\mathsf{CC}}\left(\mathsf{Min}\right) - \mathsf{V}_{\mathsf{OH}}}{\mathsf{N}_{\mathsf{1}}\left(\mathsf{I}_{\mathsf{OH}}\right) \, + \, \mathsf{N}_{\mathsf{2}}\left(\mathsf{I}_{\mathsf{IH}}\right)}$$

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

Connection Diagram



Order Number DM5405J, DM5405W or DM7405N See Package Number J14A, N14A or W14B

Function Table

H = High Logic Level L = Low Logic Level Absolute Maximum Ratings (Note 1) Operating Free Air Temperature Range

 Supply Voltage
 7V
 DM54
 -55°C to +125°C

 Input Voltage
 5.5V
 DM74
 0°C to +70°C

 Output Voltage
 7V
 Storage Temperature Range
 -65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	DM5405		DM7405			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			5.5			5.5	V
I _{OL}	Low Level Output Current			16			16	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)

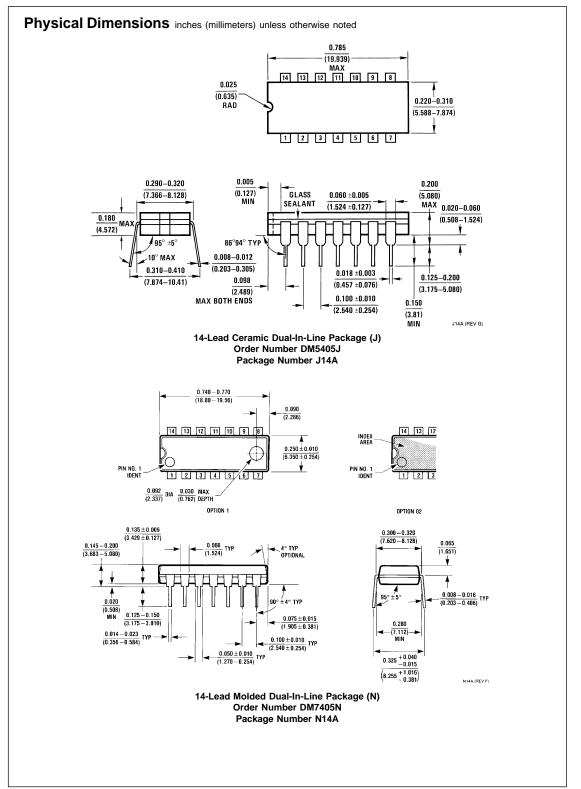
Symbol	Parameter	Conditions	Min	Тур	Max	Units
				(Note 2)		
V _I	Input Clamp Voltage	V_{CC} = Min, I_{I} = -12 mA			-1.5	V
I _{CEX}	High Level Output	V_{CC} = Min, V_{O} = 5.5V			250	μA
	Current	V _{IL} = Max				
V _{OL}	Low Level Output	V _{CC} = Min, I _{OL} = Max		0.2	0.4	V
	Voltage	V _{IH} = Min				
I _I	Input Current @ Max	$V_{CC} = Max, V_I = 5.5V$			1	mA
	Input Voltage					
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	V _{CC} = Max		6	12	mA
	Outputs High					
I _{CCL}	Supply Current with	V _{CC} = Max		18	33	mA
	Outputs Low					

Switching Characteristics

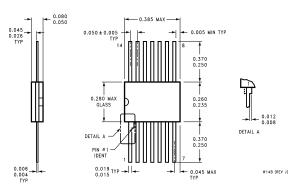
at V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

Symbol	Parameter	Conditions	Min	Max	Units
t _{PLH}	Propagation Delay Time	C _L = 15 pF		55	ns
	Low to High Level Output	$R_L = 4 k\Omega (t_{PLH})$			
t _{PHL}	Propagation Delay Time	$R_L = 400\Omega (t_{PHL})$		15	ns
	High to Low Level Output				

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



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



14-Lead Ceramic Flat Package (W) Order Number DM5405W Package Number W14B

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