DM5416/DM7416 Hex Inverting Buffers with High Voltage Open-Collector Outputs

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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

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

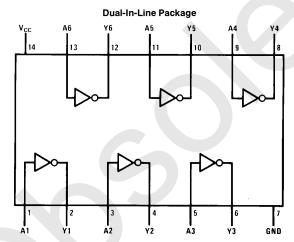
$$R_{MIN} = \frac{V_{O} (Max) - V_{OL}}{I_{OL} - N_{3} (I_{IL})}$$

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



Order Number DM5416J, DM5416W or DM7416N See NS Package Number J14A, N14A or W14B TL/F/6504-1

Function Table

$\mathbf{Y}=\overline{\mathbf{A}}$				
Input Output				
Α	Υ			
L	Н			
Н	L			

H = High Logic LevelL = Low Logic Level

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

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

Note: 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.

Recommended Operating Conditions

Symbol	Parameter	DM5416		DM7416			Units	
		Min	Nom	Max	Min	Nom	Max	Oilits
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
l _{OL}	Low Level Output Current			30			40	mA
T _A	Free Air Operating Temperature	-55		125	0		70	°C

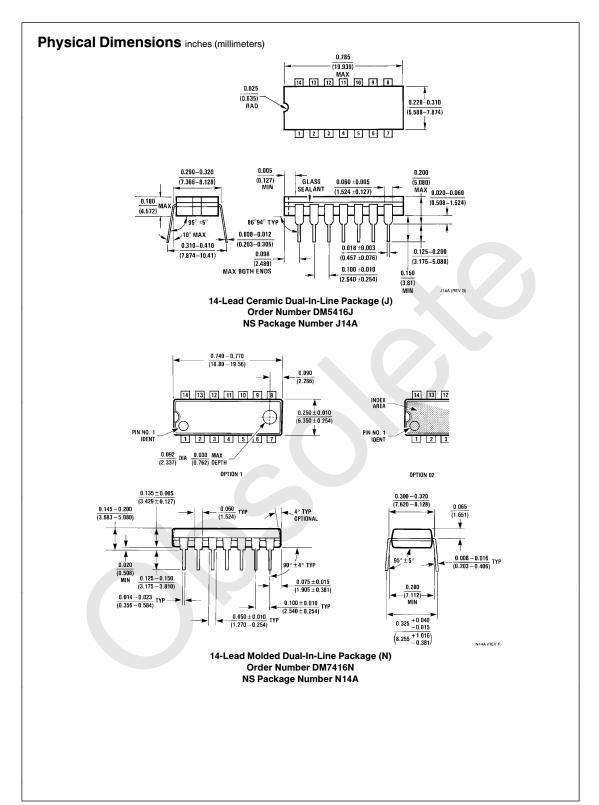
Electrical Characteristics over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
VI	Input Clamp Voltage	$V_{CC} = Min, I_I = -12 \text{ mA}$			-1.5	٧
ICEX	High Level Output Current	$V_{CC} = Min, V_O = 15V$ $V_{IL} = Max$			250	μΑ
V _{OL}	Low Level Output Voltage	$V_{CC} = Min, I_{OL} = Max$ $V_{IH} = Min$			0.7	V
		$I_{OL} = 16 \text{ mA}, V_{CC} = \text{Min}$			0.4	
l _l	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
Іссн	Supply Current with Outputs High	V _{CC} = Max		30	48	mA
ICCL	Supply Current with Outputs Low	V _{CC} = Max		27	51	mA

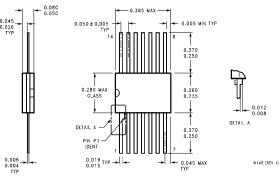
$\textbf{Switching Characteristics} \text{ at V}_{CC} = 5 \text{V and T}_{A} = 25 ^{\circ}\text{C (See Section 1 for Test Waveforms and Output Load)}$

Symbol	Parameter	Conditions	Min	Max	Units
t _{PLH}	Propagation Delay Time Low to High Level Output	$C_L = 15 pF$ $R_L = 110\Omega$		15	ns
t _{PHL}	Propagation Delay Time High to Low Level Output			23	ns

Note 1: All typicals are at $V_{CC}=5V$, $T_A=25^{\circ}C$.



Physical Dimensions inches (millimeters) (Continued)



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

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