

Absolute Maximum Ratings (Note 1)

Supply Voltage

7V

Input Voltage

7V

Operating Free Air Temperature Range

DM54LS

DM74LS

Storage Temperature Range

–55°C to +125°C

0°C to +70°C

–65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	DM54LS251			DM74LS251			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			0.7			0.8	V
I_{OH}	High Level Output Current			–1			–2.6	mA
I_{OL}	Low Level Output Current			12			24	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	$V_{CC} = \text{Min}, I_I = -18 \text{ mA}$			–1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = \text{Min}, I_{OH} = \text{Max}$ $V_{IL} = \text{Max}, V_{IH} = \text{Min}$	DM54 2.4	3.4		V
V_{OL}	Low Level Output Voltage	$V_{CC} = \text{Min}, I_{OL} = \text{Max}$ $V_{IL} = \text{Max}, V_{IH} = \text{Min}$ $I_{OL} = 12 \text{ mA}, V_{CC} = \text{Min}$	DM54 DM74 DM74	0.25 0.35 0.25	0.4 0.5 0.4	V
I_I	Input Current @ Max Input Voltage	$V_{CC} = \text{Max}, V_I = 7 \text{ V}$			0.1	mA
I_{IH}	High Level Input Current	$V_{CC} = \text{Max}, V_I = 2.7 \text{ V}$			20	μA
I_{IL}	Low Level Input Current	$V_{CC} = \text{Max}, V_I = 0.4 \text{ V}$			–0.4	mA
I_{OZH}	Off-State Output Current with High Level Output Voltage Applied	$V_{CC} = \text{Max}, V_O = 2.7 \text{ V}$ $V_{IH} = \text{Min}, V_{IL} = \text{Max}$			20	μA
I_{OZL}	Off-State Output Current with Low Level Output Voltage Applied	$V_{CC} = \text{Max}, V_O = 0.4 \text{ V}$ $V_{IH} = \text{Min}, V_{IL} = \text{Max}$			–20	μA
I_{OS}	Short Circuit Output Current	$V_{CC} = \text{Max}$ (Note 3)	DM54 –20		–100 –100	mA
I_{CC1}	Supply Current	$V_{CC} = \text{Max}$ (Note 4)		6.1	10	mA
I_{CC2}	Supply Current	$V_{CC} = \text{Max}$ (Note 5)		7.1	12	mA

Note 2: All typicals are at $V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}$.

Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Note 4: I_{CC1} is measured with the outputs open, STROBE grounded, and all other inputs at 4.5V.

Note 5: I_{CC2} is measured with the outputs open and all inputs at 4.5V.

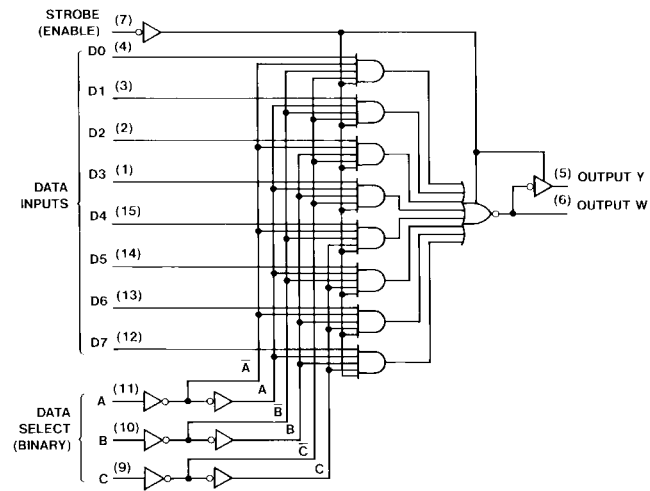
Switching Characteristics

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

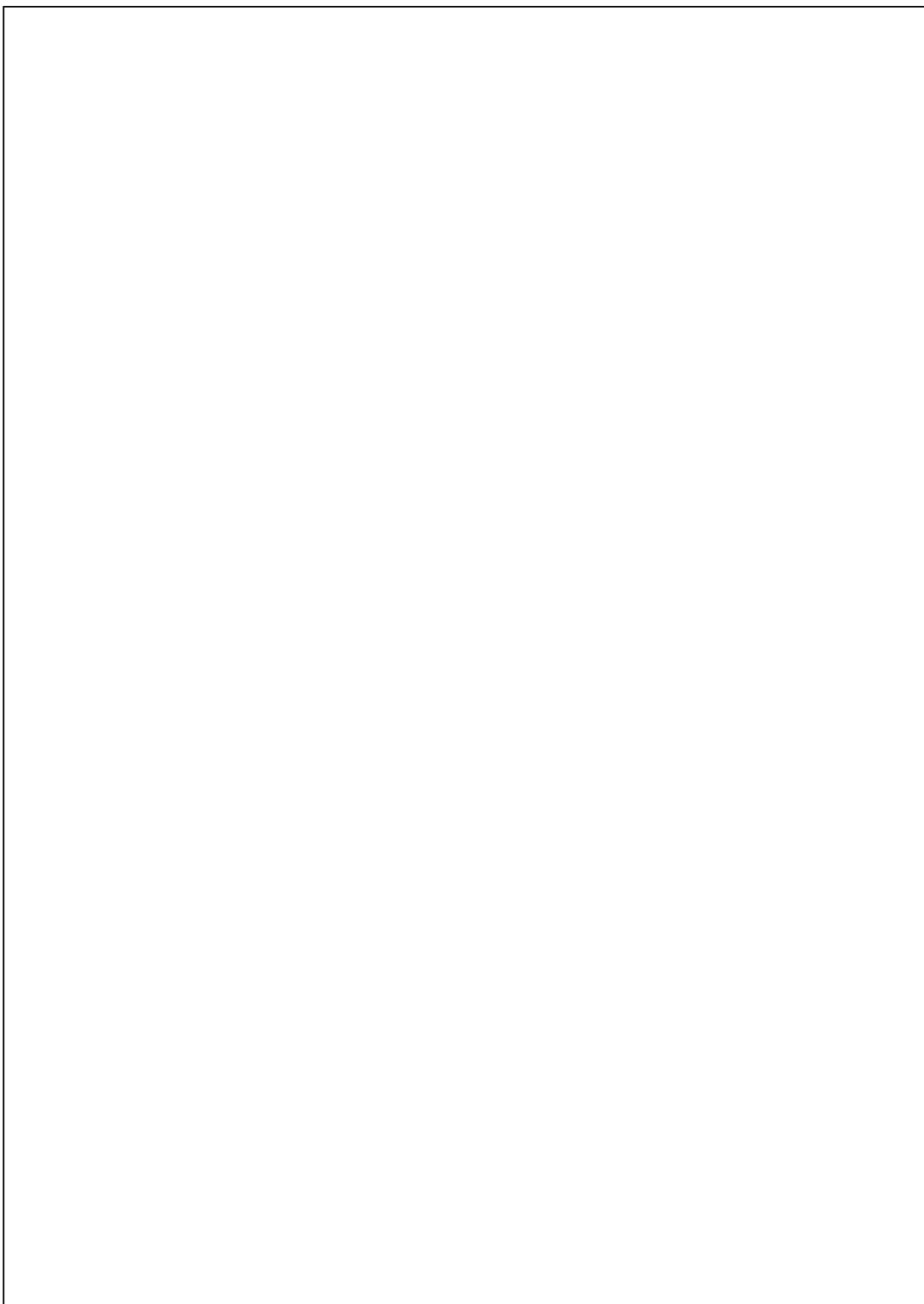
Symbol	Parameter	From (Input) to (Output)	R _L = 667Ω				Units
			C _L = 45 pF		C _L = 150 pF		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time Low to High Level Output	A, B, C (4 Levels) to Y		45		53	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	A, B, C (4 Levels) to Y		45		53	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	A, B, C (3 Levels) to W		33		38	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	A, B, C (3 Levels) to W		33		42	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	D to Y		28		35	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	D to Y		28		38	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	D to W		15		25	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	D to W		15		25	ns
t _{PZH}	Output Enable Time to High Level Output	Strobe to Y		45		60	ns
t _{PZL}	Output Enable Time to Low Level Output	Strobe to Y		40		51	ns
t _{PHZ}	Output Disable Time from High Level Output (Note 6)	Strobe to Y		45			ns
t _{PLZ}	Output Disable Time from Low Level Output (Note 6)	Strobe to Y		25			ns
t _{PZH}	Output Enable Time to High Level Output	Strobe to W		27		40	ns
t _{PZL}	Output Enable Time to Low Level Output	Strobe to W		40		47	ns
t _{PHZ}	Output Disable Time from High Level Output (Note 6)	Strobe to W		55			ns
t _{PLZ}	Output Disable Time from Low Level Output (Note 6)	Strobe to W		25			ns

Note 6: $C_L = 5\text{ pF}$

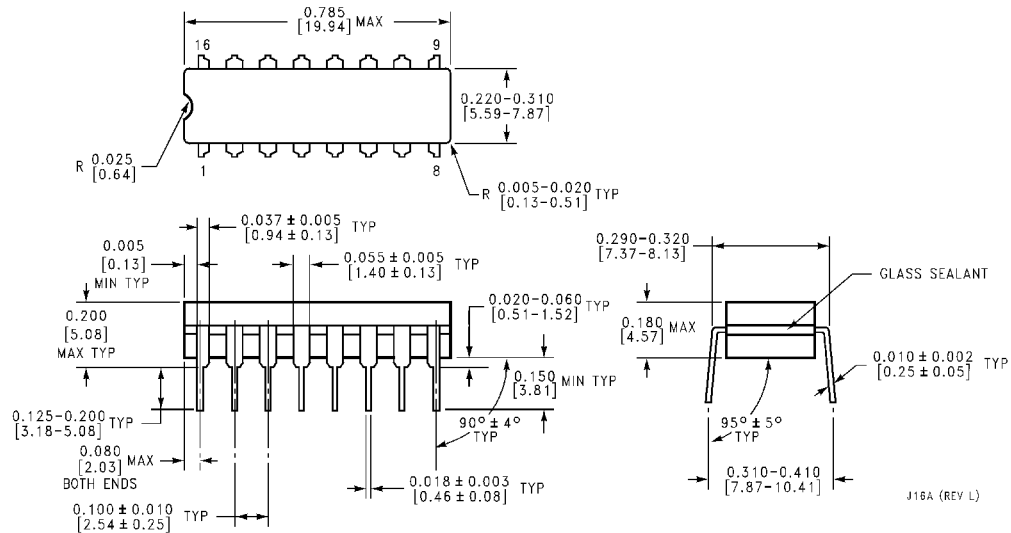
Logic Diagram



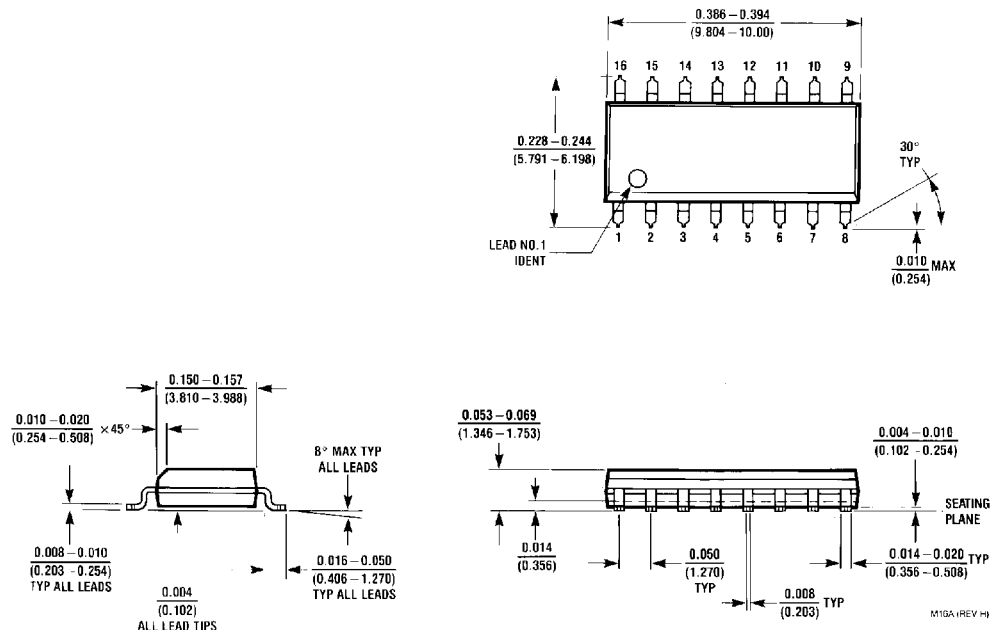
DS006415-2



Physical Dimensions inches (millimeters) unless otherwise noted

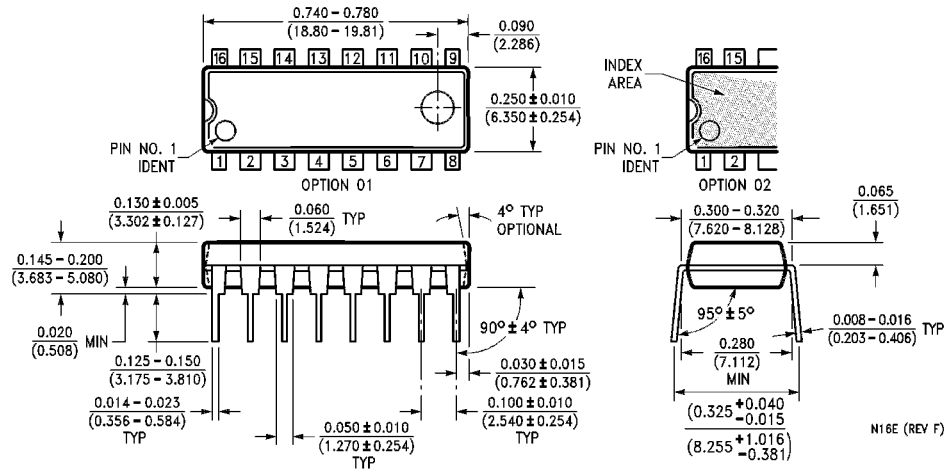


16-Lead Ceramic Dual-In-Line Package (J)
Order Number DM54LS251J
Package Number J16A

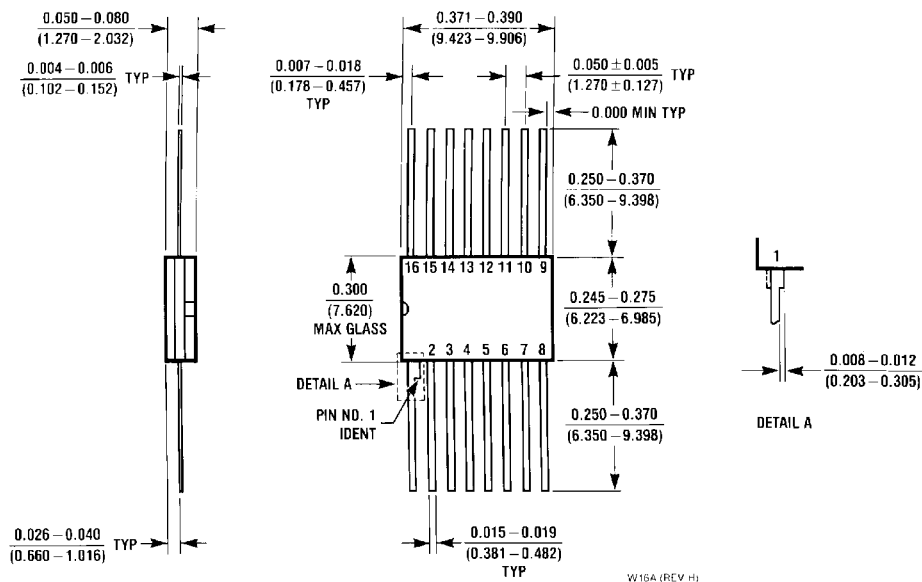


16-Lead Small Outline Molded Package (M)
Order Number DM74LS251M
Package Number M16A

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



Molded Dual-In-Line Package (N)
Order Number DM74LS251N
Package Number N16E



16-Lead Ceramic Flat Package (W)
Order Number DM54LS251W
Package Number W16A