

## DM74S253 Dual 3-STATE 1 of 4 Line Data Selectors/Multiplexers

### General Description

Each of these Schottky-clamped data selectors/multiplexers contains inverters and drivers to supply fully complementary, on-chip, binary decoding data selection to the AND-OR gates. Separate output control inputs are provided for each of the two four-line sections.

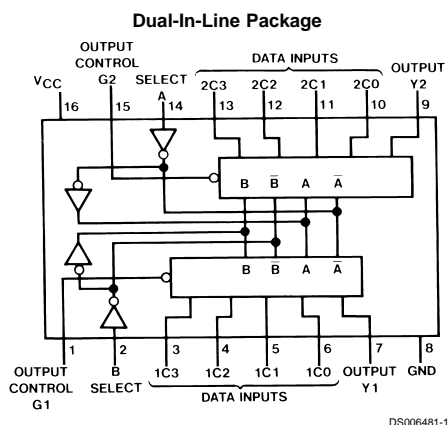
The 3-STATE outputs can interface directly with data lines of bus-organized systems. With all but one of the common outputs disabled (at a high impedance state), the low impedance of the single enable output will drive the bus line to a high or low logic level.

- Schottky-diode-clamped transistors
- Permits multiplexing from N lines to 1 line
- Performs parallel-T-serial conversion
- Strobe/output control
- High fan-out totem-pole outputs
- Typical propagation delay
  - From data to output 6 ns
  - From select to output 12 ns
- Typical power dissipation 275 mW

### Features

- 3-STATE version of S153 with same pin-out

### Connection Diagram



Order Number DM54S253J, DM54S253W or  
DM74S253N  
Package Number J16A, N16E or W16A

### Function Table

Select Inputs		Data Inputs				Output Control	Output
B	A	C0	C1	C2	C3	G	Y
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

Address inputs A and B are common to both sections.  
H = High Level, L = Low Level, X = Don't Care, Z = High Impedance

**Absolute Maximum Ratings** (Note 1)

Supply Voltage	7V	DM54S	-55°C to +125°C
Input Voltage	5.5V	DM74S	0°C to +70°C
Operating Free Air Temperature Range		Storage Temperature Range	-65°C to +150°C

**Recommended Operating Conditions**

Symbol	Parameter	DM54S253			DM74S253			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>IH</sub>	High Level Input Voltage	2			2			V
V <sub>IL</sub>	Low Level Input Voltage			0.8			0.8	V
I <sub>OH</sub>	High Level Output Current			-2			-6.5	mA
I <sub>OL</sub>	Low Level Output Current			20			20	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 (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA			-1.2	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max	DM54	2.4	3.4	V
		V <sub>IL</sub> = Max, V <sub>IH</sub> = Min	DM74	2.4	3.2	
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max V <sub>IH</sub> = Min, V <sub>IL</sub> = Max			0.5	V
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> = 2.7V			50	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.5V			-2	mA
I <sub>OZH</sub>	Off-State Output Current with High Level Output Voltage Applied	V <sub>CC</sub> = Max, V <sub>O</sub> = 2.4V V <sub>IH</sub> = Min, V <sub>IL</sub> = Max			50	μA
I <sub>OZL</sub>	Off-State Output Current with Low Level Output Voltage Applied	V <sub>CC</sub> = Max, V <sub>O</sub> = 0.5V V <sub>IH</sub> = Min, V <sub>IL</sub> = Max			-50	μA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 3)	DM54	-40	-100	mA
			DM74	-40	-100	
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = Max (Note 4)		55	70	mA

**Note 2:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°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<sub>CC</sub> is measured with all outputs open.

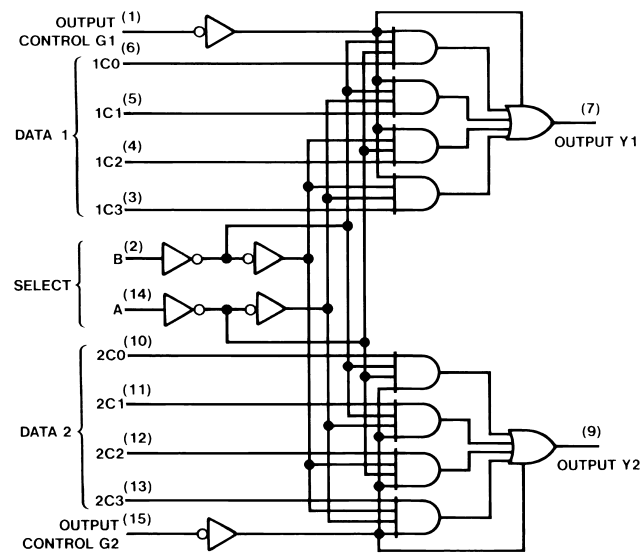
## Switching Characteristics

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

Symbol	Parameter	From (Input) To (Output)	$R_L = 280\Omega$				Units
			$C_L = 15\text{ pF}$		$C_L = 50\text{ pF}$		
			Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay Time Low to High Level Output	Data to Y		9		12	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	Data to Y		9		12	ns
$t_{PLH}$	Propagation Delay Time Low to High Level Output	Select to Y		18		21	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	Select to Y		18		21	ns
$t_{PZH}$	Output Enable Time to High Level Output	Output Control to Y		16.5		19.5	ns
$t_{PZL}$	Output Enable Time to Low Level Output	Output Control to Y		18		21	ns
$t_{PHZ}$	Output Disable Time to High Level Output (Note 5)	Output Control to Y		9.5			ns
$t_{PLZ}$	Output Disable Time to Low Level Output (Note 5)	Output Control to Y		15			ns

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

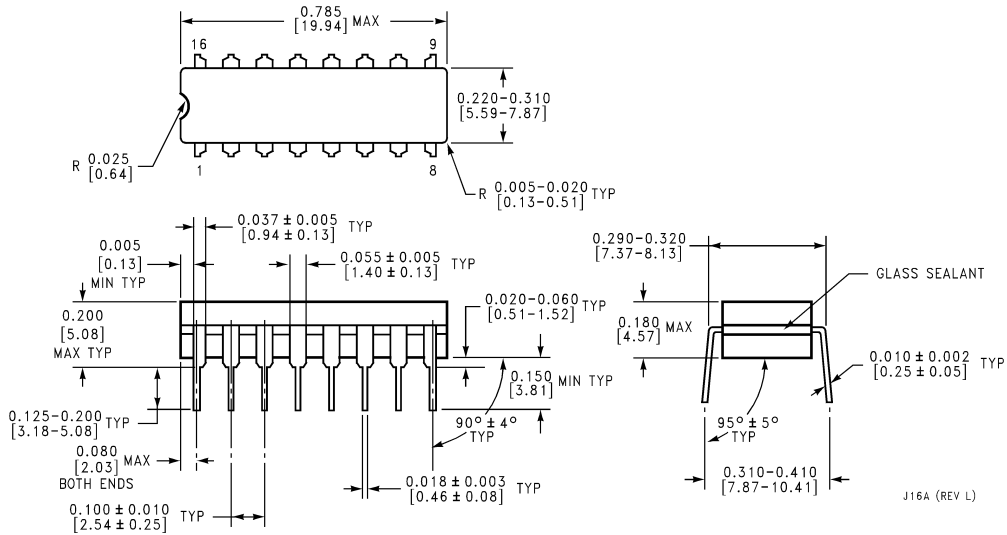
## Logic Diagram



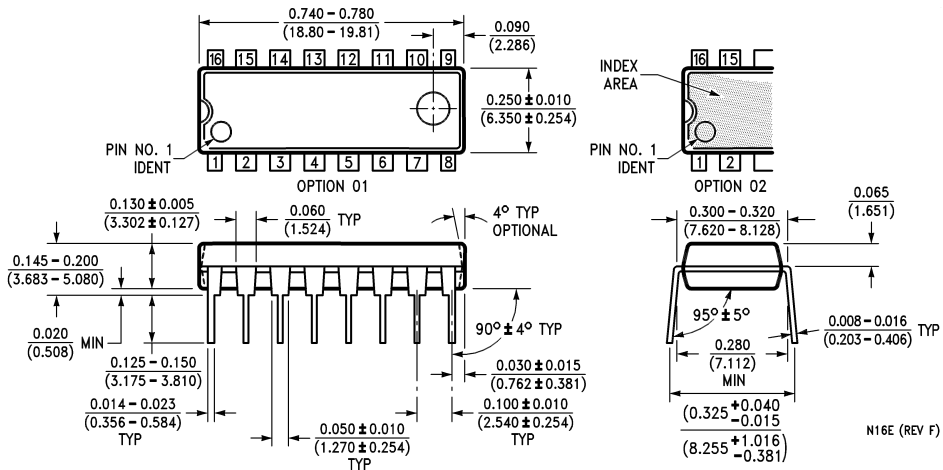
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**Physical Dimensions** inches (millimeters) unless otherwise noted

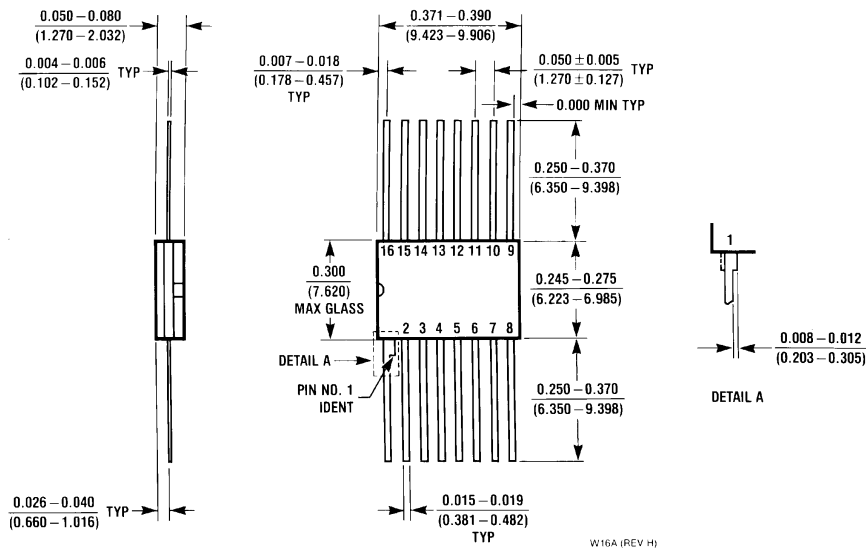


**16-Lead Ceramic Dual-In-Line Package (J)**  
**Order Number DM54S253J**  
**Package Number J16A**



**16-Lead Molded Dual-In-Line Package (N)**  
**Order Number DM74S253N**  
**Package Number N16E**

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



**16-Lead Ceramic Flat Package (W)**  
**Order Number DM54S253W**  
**Package Number W16A**

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