

## DM74ALS253

### 3-STATE Dual 1 of 4 Line Data Selector/Multiplexer

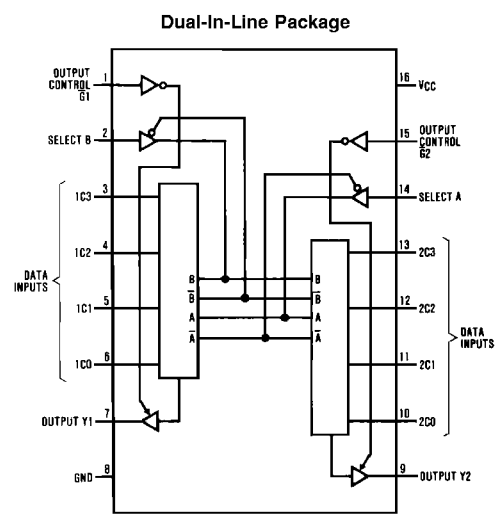
#### General Description

This Data Selector/Multiplexer contains full on-chip decoding to select one-of-four data sources as a result of a unique two-bit binary code at the Select Inputs. Each of the two Data Selector/Multiplexer circuits have their own separate Data and Output Control inputs and a non-inverting 3-STATE output buffer. The Output Control inputs, when at the high level, place the corresponding output in the high impedance Off state. In order to prevent bus access conflicts, output disable times are shorter than output enable times. The Select input buffers incorporate internal overlap features to ensure that select input changes do not cause invalid output transients.

#### Features

- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Switching performance is guaranteed over full temperature and  $V_{CC}$  supply range
- Pin and functional compatible with LS family counterpart
- Improved output transient handling capability
- Output control circuitry incorporates power-up 3-STATE feature

#### Connection Diagram



DS006215-1

Order Number DM74ALS253M or DM74ALS253N  
See Package Number M16A or N16A

#### Function Table

Select Inputs		Data Inputs				Output Control	Output
B	A	C0	C1	C2	C3	$\bar{G}$	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, $V_{CC}$	7V	DM74ALS	0°C to +70°C
Input Voltage	7V	Storage Temperature Range	-65°C to +150°C
Voltage Applied to Disabled Output	5.5V	Typical $\theta_{JA}$	
Operating Free Air Temperature Range		N Package	78.0°C/W
		M Package	107.0°C/W

## Recommended Operating Conditions

Symbol	Parameter	DM74ALS253			Units
		Min	Nom	Max	
$V_{CC}$	Supply Voltage	4.5	5	5.5	V
$V_{IH}$	High Level Input Voltage	2			V
$V_{IL}$	Low Level Input Voltage			0.8	V
$I_{OH}$	High Level Output Current			-2.6	mA
$I_{OL}$	Low Level Output Current			24	mA
$T_A$	Free Air Operating Temperature	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. All typical values are measured at  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ .

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{IK}$	Input Clamp Voltage	$V_{CC} = 4.5V$ , $I_{IN} = -18\text{ mA}$			-1.5	V
$V_{OH}$	High Level Output Voltage	$V_{CC} = 4.5V$ , $I_{OH} = \text{Max}$	2.4	3.2		V
		$I_{OH} = 400\ \mu A$ , $V_{CC} = 4.5V\text{ to }5.5V$	$V_{CC} - 2$			V
$V_{OL}$	Low Level Output Voltage	$V_{CC} = 4.5V$		0.25	0.4	V
		$I_{OL} = 12\text{ mA}$ $I_{OL} = 24\text{ mA}$		0.35	0.5	V
$I_i$	Input Current at Max Input Voltage	$V_{CC} = 5.5V$ , $V_{IN} = 7V$			0.1	mA
$I_{IH}$	High Level Input Current	$V_{CC} = 5.5V$ , $V_{IN} = 2.7V$			20	$\mu A$
$I_{IL}$	Low Level Input Current	$V_{CC} = 5.5V$ , $V_{IN} = 0.4V$			-0.1	mA
$I_O$	Output Drive Current	$V_{CC} = 5.5V$ , $V_{OUT} = 2.25V$	-30		-112	mA
$I_{OZH}$	Off-State Output Current, High Bias	$V_{CC} = 5.5V$ , $V_{OUT} = 2.7V$			20	$\mu A$
$I_{OZL}$	Off-State Output Current, Low Bias	$V_{CC} = 5.5V$ , $V_{OUT} = 0.4V$			-20	$\mu A$
$I_{CC}$	Supply Current	$V_{CC} = 5.5V$	Output High	6.5	12	mA
			Output Low	6.5	12	
			Output Disabled	7.5	14	

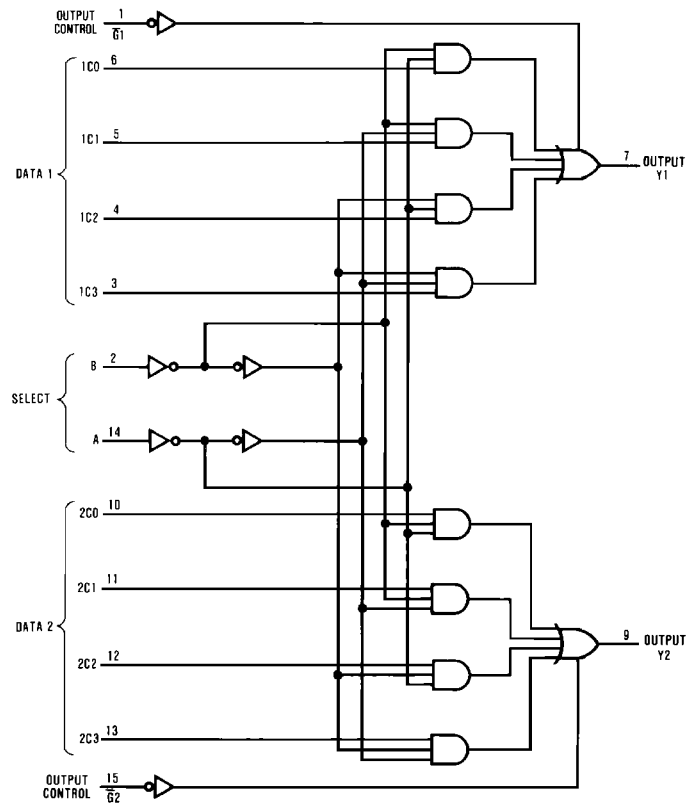
## Switching Characteristics

over recommended operating free air temperature range. All typical values are measured at  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ . (Note 2)

Symbol	Parameter	From (Input) To (Output)	Conditions	DM74ALS253		Units
				Min	Max	
$t_{PLH}$	Propagation Delay Time Low to High Level Output	Select to Y	$V_{CC} = 4.5V$ to $5.5V$ $C_L = 50$ pF $R_L = 500\Omega$	5	21	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	Select to Y		5	21	ns
$t_{PLH}$	Propagation Delay Time Low to High Level Output	Data to Y		2	10	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	Data to Y		3	14	ns
$t_{PZH}$	Output Enable Time to High Level Output	Output Control to Y		3	14	ns
$t_{PZL}$	Output Enable Time to Low Level Output	Output Control to Y		4	16	ns
$t_{PHZ}$	Output Disable Time from High Level Output	Output Control to Y		2	10	ns
$t_{PLZ}$	Output Disable Time from Low Level Output	Output Control to Y		2	14	ns

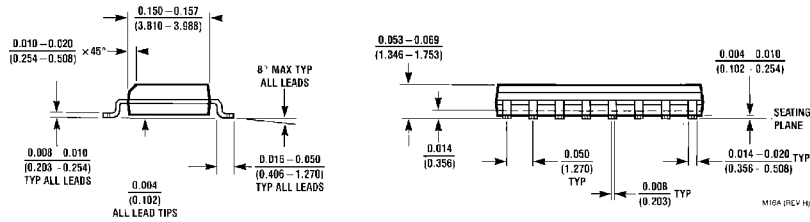
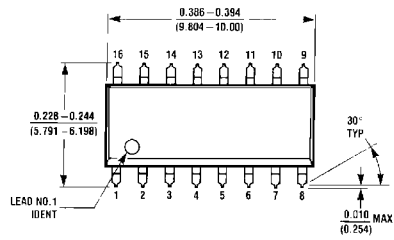
**Note 2:** See Section 1 for test waveforms and output load.

# Logic Diagram

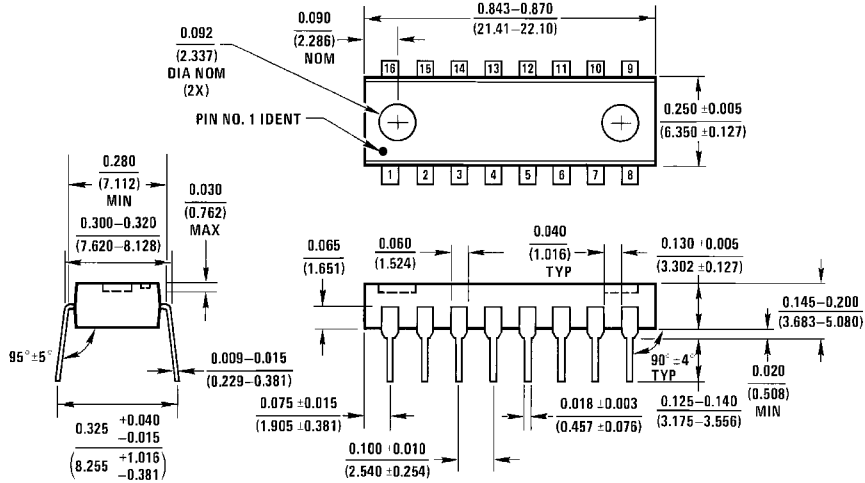


DS0052.15-2

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



**S.O. Package (M)**  
**Order Number DM74ALS253M**  
**Package Number M16A**



**Molded Dual-In-Line Package (N)**  
**Order Number DM74ALS253N**  
**Package Number N16A**

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