# FAIRCHILD

SEMICONDUCTOR

# DM74LS257B 3-STATE Quad 2-Data Selectors/Multiplexers

### **General Description**

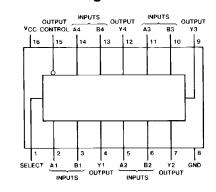
These Schottky-clamped high-performance multiplexers feature 3-STATE outputs that can interface directly with data lines of bus-organized systems. With all but one of the common outputs disabled (at a high impedance state), the low impedance of the single enabled output will drive the bus line to a HIGH or LOW logic level. To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the output enable circuitry is designed such that the output disable times are shorter than the output enable times.

This 3-STATE output feature means that n-bit (paralleled) data selectors with up to 258 sources can be implemented

**Ordering Code:** 

Order Number	Package Number	Package Description
DM74LS257BM	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
DM74LS257BN	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
Devices also available	in Tape and Reel. Specify	by appending the suffix letter "X" to the ordering code.

#### **Connection Diagram**



#### **Function Table**

	Inputs	5		Output Y
Output Control	Select	Α	в	LS257
Н	Х	Х	Х	Z
L	L	L	Х	L
L	L	н	Х	Н
L	Н	х	L	L
L	н	х	н	н
GH Level W Level	X = Don Z = High	't Care Impedanc	e (off)	1

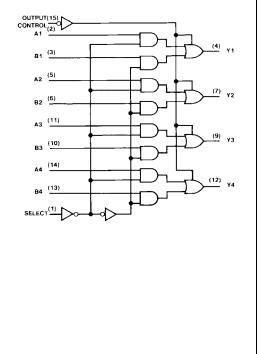


Features

performance

high-performance systems

■ Typical power dissipation: 50 mW



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for data buses. It also permits the use of standard TTL reg-

■ 3-STATE versions LS157 and LS158 with same pinouts

Schottky-clamped for significant improvement in A-C

isters for data retention throughout the system.

Provides bus interface from multiple sources in

Average propagation delay from data input 12 ns

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## Absolute Maximum Ratings(Note 1)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	$0^{\circ}C$ to $+70^{\circ}C$
Storage Temperature Range	-65°C to +150°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 tables 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	Min	Nom	Max	Units
V <sub>CC</sub>	Supply Voltage	4.75	5	5.25	V
V <sub>IH</sub>	HIGH Level Input Voltage	2			V
V <sub>IL</sub>	LOW Level Input Voltage			0.8	V
I <sub>OH</sub>	HIGH Level Output Current			-2.6	mA
I <sub>OL</sub>	LOW Level Output Current			24	mA
T <sub>A</sub>	Free Air Operating Temperature	0		70	°C

## **DC Electrical Characteristics**

Symbol	Parameter	Conditions		Min	Typ (Note 2)	Max	Units	
VI	Input Clamp Voltage	$V_{CC} = Min, I_I = -18 \text{ mA}$				-1.5	V	
V <sub>он</sub>	HIGH Level Output Voltage	V <sub>IL</sub> = Max, V <sub>IH</sub> = Min		2.4	3.1		V	
V <sub>OL</sub>	LOW Level Output	V <sub>IL</sub> = Max, V <sub>IH</sub> = Min			0.35	0.5	v	
	Voltage	I <sub>OL</sub> = 12 mA, V <sub>CC</sub> = Min			0.25	0.4	v	
1	Input Current @ Max	V <sub>CC</sub> = Max,	Select			0.2		
	Input Voltage	V <sub>1</sub> = 7V	Other			0.1	mA	
I <sub>IH</sub>	HIGH Level Input	V <sub>CC</sub> = Max,	Select			40	۵	
	Current	$V_{I} = 2.7V$	Other			20	μΑ	
IL	LOW Level Input	V <sub>CC</sub> = Max,	Select			-0.8		
	Current	$V_{I} = 0.4V$	Other			-0.4	mA	
I <sub>OZH</sub>	OFF-State Output Current with	$V_{CC} = Max, V_O = 2.7V$				20		
	HIGH Level Output Voltage Applied	$V_{IH} = Min, V_{IL} = Max$				20	μA	
OZL	OFF-State Output Current with	$V_{CC} = Max, V_O = 0.4V$				20		
	LOW Level Output Voltage Applied	V <sub>IH</sub> = Min, V <sub>IL</sub> = Max			-20	μA		
os	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 3)		-20		-100	mA	
ССН	Supply Current with Outputs HIGH	V <sub>CC</sub> = Max (Note 4)			5.9	10	mA	
CCL	Supply Current with Outputs LOW	V <sub>CC</sub> = Max (Note 4)			9.2	16	mA	
ccz	Supply Current with Outputs Disabled	V <sub>CC</sub> = Max (Note 4)			12	19	mA	

Note 2: All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> =  $\overline{25^{\circ}C}$ .

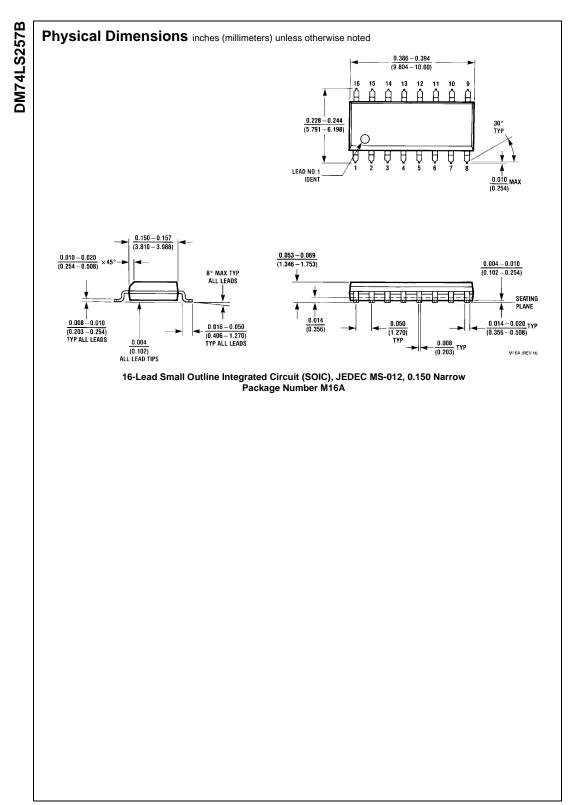
Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Note 4: I<sub>CC</sub> is measured with all outputs open and all possible inputs grounded, while achieving the stated output conditions.

$V_{CC} = 5V$ and $T_A = 25^{\circ}C$			<b>RL</b> = 667Ω				T
Symbol	Parameter	From (Input) To (Output)	C <sub>L</sub> = 45 pF		C <sub>L</sub> = 150 pF		Units
			Min	Мах	Min	Max	_
t <sub>PLH</sub>	Propagation Delay Time LOW-to-HIGH Level Output	Data to Output		18		27	ns
t <sub>PHL</sub>	Propagation Delay Time HIGH-to-LOW Level Output	Data to Output		18		27	ns
t <sub>PLH</sub>	Propagation Delay Time LOW-to-HIGH Level Output	Select to Output		28		35	ns
t <sub>PHL</sub>	Propagation Delay Time HIGH-to-LOW Level Output	Select to Output		35		42	ns
t <sub>PZH</sub>	Output Enable Time to HIGH Level Output	Output Control to Y		15		27	ns
t <sub>PZL</sub>	Output Enable Time to LOW Level Output	Output Control to Y		28		38	ns
t <sub>PHZ</sub>	Output Disable Time from HIGH Level Output (Note 5)	Output Control to Y		28			ns
t <sub>PLZ</sub>	Output Disable Time from LOW Level Output (Note 5)	Output Control to Y		25			ns

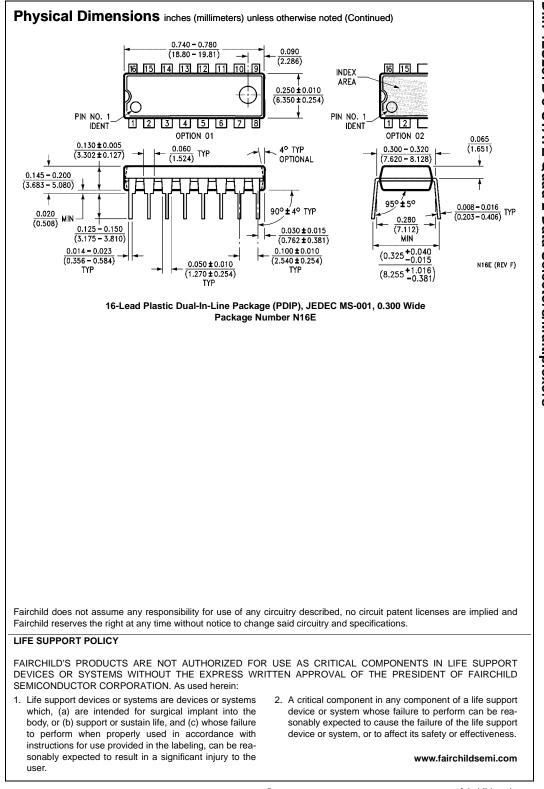
Note 5:  $C_L = 5 \text{ pF}$ 

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4



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