FAIRCHILD

SEMICONDUCTOR ™

April 1984
Revised February 2000

DM74ALS157 • DM74ALS158
Quad 1-of-2 Line Data Selector/Multiplexer

General Description

These data selectors/multiplexers contain inverters and drivers to supply full on-chip data selection to the four output gates. A separate strobe input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs. The ALS157 presents true data whereas the ALS158 presents inverted data to minimize propagation delay time.

Features

■ Switching specifications at 50 pF

■ Switching specifications guaranteed over full temperature and V_{CC} range

■ Advanced oxide-isolated, ion-implanted Schottky TTL process

■ Functionally and pin for pin compatible with Schottky and low power Schottky TTL counterpart

■ Improved AC performance over Schottky and low power Schottky counterparts

■ Expand any data input point

■ Multiplex dual data buses

■ General four functions of two variables (one variable is common)

■ Source programmable counters

Ordering Code:

Order Number	Package Number	Package Description
DM74ALS157M	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
DM74ALS157SJ	M16D	16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
DM74ALS157N	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
DM74ALS158N	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
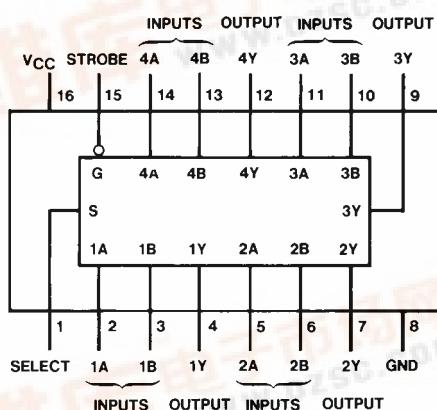
Function Table

Inputs				Output Y	
Strobe	Select	A	B	DM74ALS157	DM74ALS158
H	X	X	X	L	H
L	L	L	X	L	H
L	L	H	X	H	L
L	H	X	L	L	H
L	H	X	H	H	L

H = HIGH Level
L = LOW Level
X = Don't Care

DM74ALS157 • DM74ALS158 Quad 1-of-2 Line Data Selector/Multiplexer

Logic Diagrams

DM74ALS157
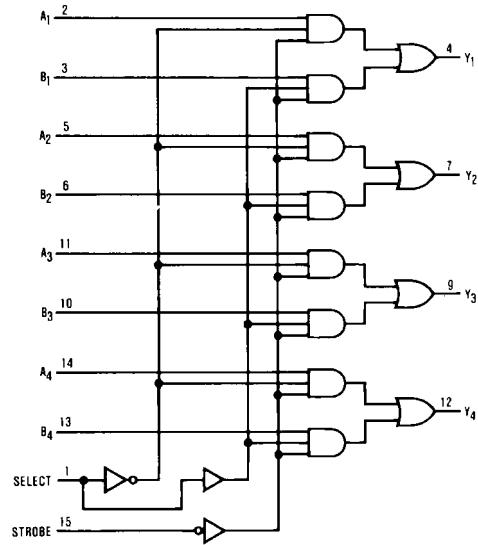
DM74ALS158
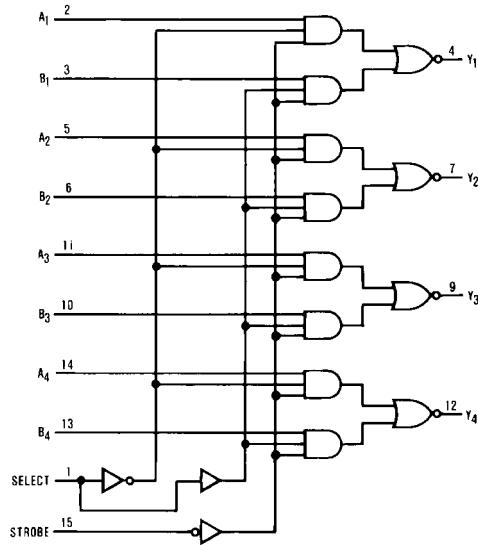
Absolute Maximum Ratings(Note 1)

Supply Voltage   7V

Input Voltage   7V

Operating Free Air Temperature Range   0°C to +70°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_{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			−0.4	mA
I_{OL}	LOW Level Output Current			8	mA
T_A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

over recommended operating free air temperature range. All typical values are measured at $V_{CC} = 5V$, $T_A = 25°C$.

Symbol	Parameter	Conditions		Min	Typ	Max	Units
V_{IK}	Input Clamp Voltage	$V_{CC} = 4.5V$, $I_I = -18$ mA				−1.2	V
V_{OH}	HIGH Level Output Voltage	$I_{OH} = -0.4$ mA, $V_{CC} = 4.5V$ to 5.5V		$V_{CC} - 2$			V
V_{OL}	LOW Level Output Voltage	$V_{CC} = 4.5V$	$I_{OL} = 4$ mA		0.25	0.4	V
			$I_{OL} = 8$ mA		0.35	0.5	V
I_I	Input Current @ Maximum Input Voltage	$V_{CC} = 5.5V$, $V_{IH} = 7V$				0.1	mA
I_{IH}	HIGH Level Input Current	$V_{CC} = 5.5V$, $V_{IH} = 2.7V$				20	µA
I_{IL}	LOW Level Input Current	$V_{CC} = 5.5V$, $V_{IL} = 0.4V$				−0.1	mA
I_O	Output Drive Current	$V_{CC} = 5.5V$	$V_O = 2.25V$	−30		−112	mA
I_{CC}	Supply Current	$V_{CC} = 5.5V$	DM74ALS157		6	11	mA
		All Inputs = 4.5V	DM74ALS158		5	10	mA

Switching Characteristics

over recommended operating free air temperature range.

Symbol	Parameter	From (Input) To (Output)	Conditions	DM74ALS157		DM74ALS158		Units
				Min	Max	Min	Max	
t_{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	Data to Y	$V_{CC} = 4.5V$ to 5.5V $C_L = 50$ pF $R_L = 500\Omega$	3	14	3	15	ns
t_{PHL}	Propagation Delay Time HIGH-to-LOW Level Output			2	12	1	8	ns
t_{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	Strobe to Y		6	20	5	18	ns
t_{PHL}	Propagation Delay Time HIGH-to-LOW Level Output			4	13	5	18	ns
t_{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	Select to Y		7	24	5	19	ns
t_{PHL}	Propagation Delay Time HIGH-to-LOW Level Output			4	14	5	18	ns

Physical Dimensions inches (millimeters) unless otherwise noted

0.386 − 0.394
(9.804 − 10.00)

16 15 14 13 12 11 10 9

0.228 − 0.244
(5.791 − 6.198)

30°
TYP

LEAD NO.1
IDENT

1   2   3   4   5   6   7   8

0.010 MAX
(0.254)

0.150 − 0.157
(3.810 − 3.988)

0.010 − 0.020
(0.254 − 0.508) × 45°

8° MAX TYP
ALL LEADS

0.008 − 0.010
(0.203 − 0.254)
TYP ALL LEADS

0.004
(0.102)
ALL LEAD TIPS

0.016 − 0.050
(0.406 − 1.270)
TYP ALL LEADS

0.053 − 0.069
(1.346 − 1.753)

0.004 − 0.010
(0.102 − 0.254)

SEATING
PLANE

0.014
(0.356)

0.050
(1.270)
TYP

0.008
(0.203) TYP

0.014 − 0.020
(0.356 − 0.508) TYP

M16A (REV H)
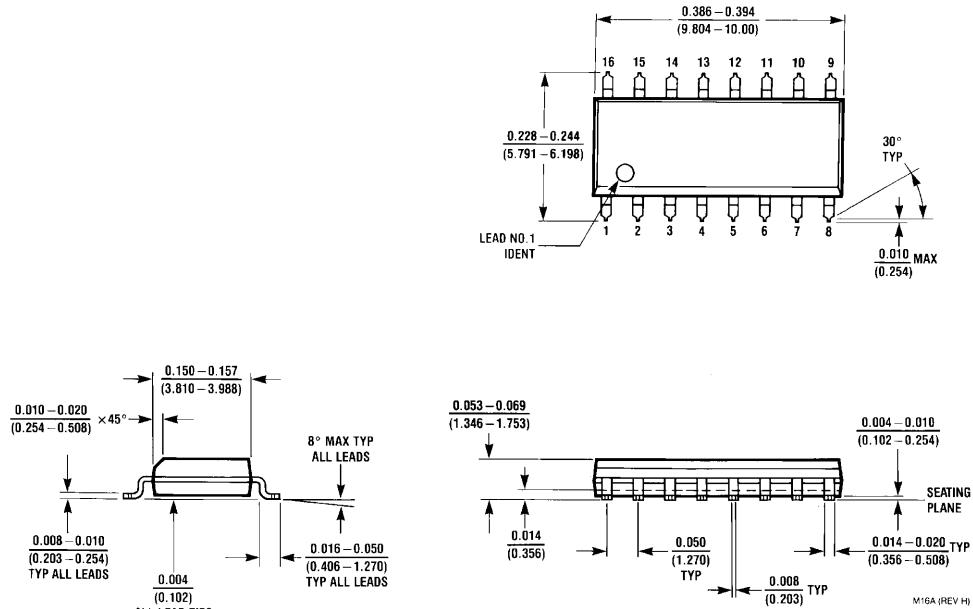
16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
Package Number M16A

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

10.2±0.1

-A-

0.47 TYP

16   9

7.8

5.3±0.1

-B-

3.9

0.2 | C | B | A
ALL LEAD TIPS

PIN #1 IDENT.

1   8

LAND PATTERN RECOMMENDATION

16   15   10   9

5.01 TYP

9.27 TYP

(2.13 TYP)

1   2   7   8

1.27 TYP   0.6 TYP

2.1 MAX.

ALL LEAD TIPS

0.1 | C

1.8±0.1

-C-

0.15±0.05

1.27 TYP

0.35-0.51

⊕ | 0.12 Ⓜ | C | A
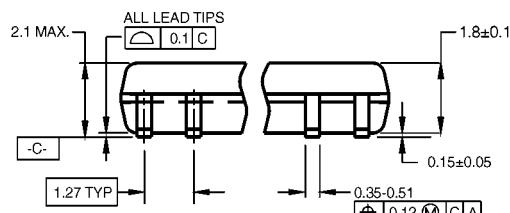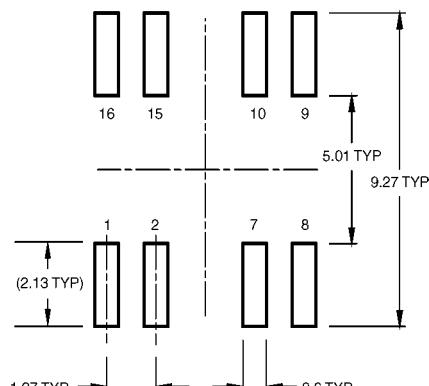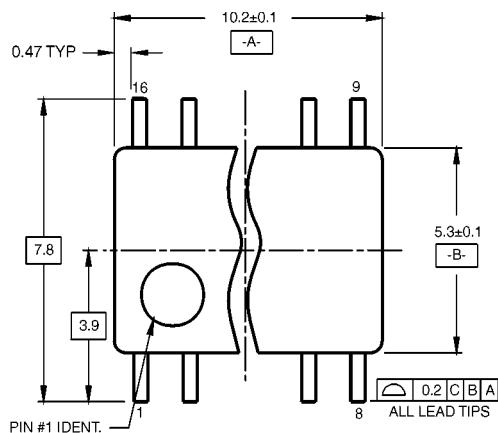
DIMENSIONS ARE IN MILLIMETERS
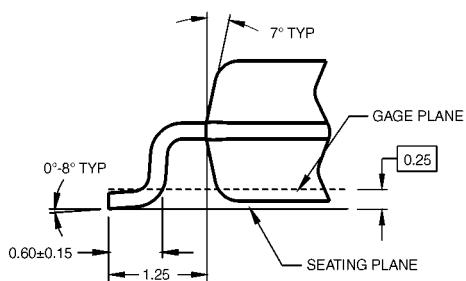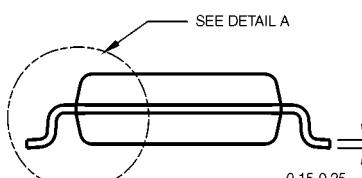
NOTES:
A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
B. DIMENSIONS ARE IN MILLIMETERS.
C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M16DRevB1

SEE DETAIL A

0.15-0.25

7° TYP

GAGE PLANE

0.25

0°-8° TYP

0.60±0.15

SEATING PLANE

1.25

DETAIL A

16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
Package Number M16D

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)
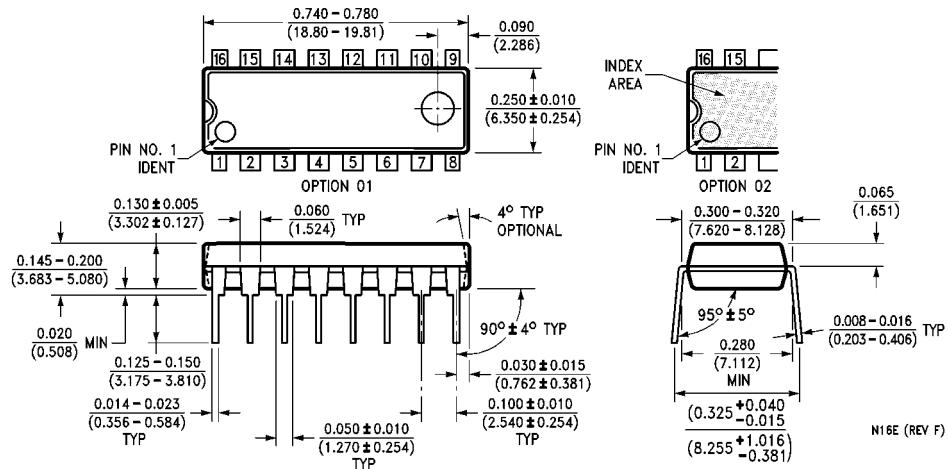
16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
Package Number N16E

LIFE SUPPORT POLICY

www.fairchildsemi.com