

## DM74ALS257, DM74ALS258 3-STATE Quad 1-of-2-Line Data Selector/Multiplexer

### Features

- Switching specifications at 50pF
- 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
- 3-STATE buffer-type outputs drive bus lines directly
- Expand any data input point
- Multiplex dual data buses
- General four functions of two variables (one variable is common)
- Source programmable counters

### General Description

These data selectors/multiplexers contain inverters and drivers to supply full on-chip data selection to the four 3-STATE outputs that can interface directly with data lines of bus-organized systems. A 4-bit word selected from one of two sources is routed to the four outputs. The DM74ALS257 presents true data whereas the DM74ALS258 presents inverted data to minimize propagation delay time.

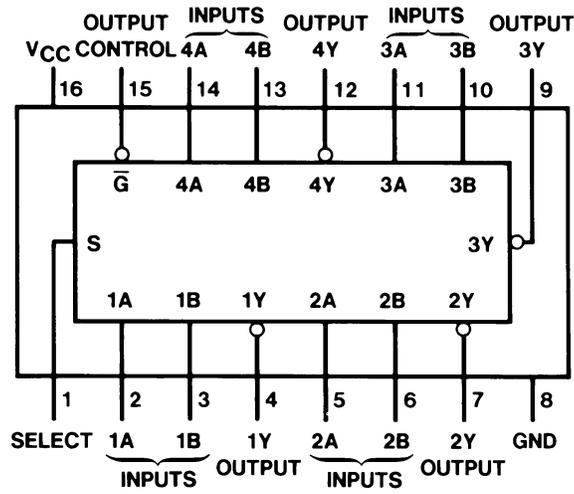
This 3-STATE output feature means that n-bit (paralleled) data selectors with up to 258 sources can be implemented for data buses. It also permits the use of standard TTL registers for data retention throughout the system.

### Ordering Information

Order Number	Package Number	Package Description
DM74ALS257M	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
DM74ALS257SJ	M16D	16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
DM74ALS258M	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering number.

## Connection Diagram

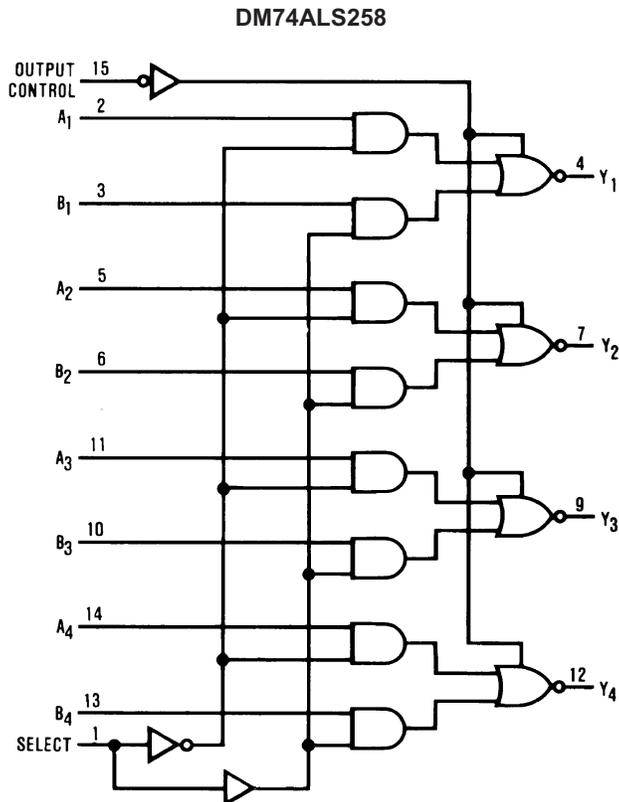
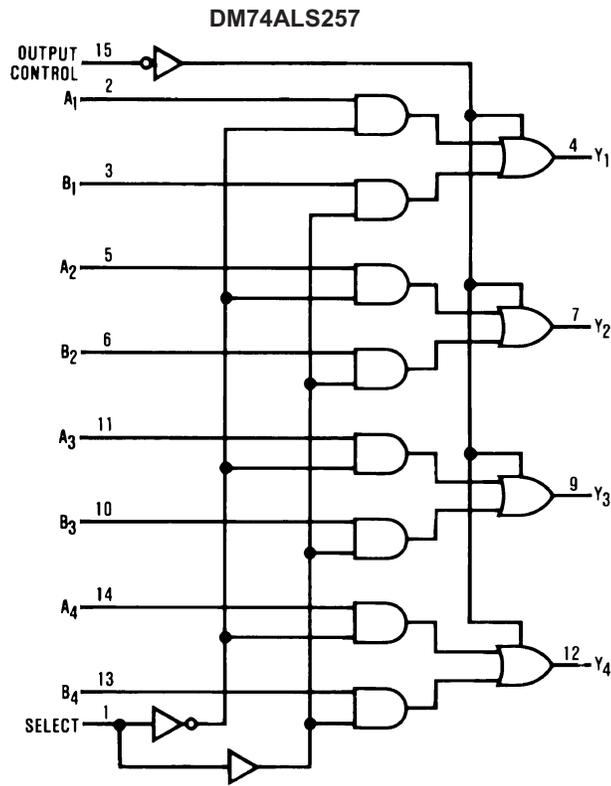


## Function Table

Inputs				Output Y	
Output Control	Select	A	B	DM74ALS257	DM74ALS258
H	X	X	X	Z	Z
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  
 Z = High Impedance (OFF)

Logic Diagrams



## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating
$V_{CC}$	Supply Voltage	7V
$V_I$	Input Voltage	7V
	Voltage Applied to Disabled Output	5.5V
$T_A$	Operating Free Air Temperature Range	0°C to +70°C
$T_{STG}$	Storage Temperature Range	-65°C to +150°C
$\theta_{JA}$	Typical Thermal Resistance	102.0°C/W

## Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

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			-2.6	mA
$I_{OL}$	LOW Level Output Current			24	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  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ .

Symbol	Parameter		Conditions	Min.	Typ.	Max.	Units		
$V_{IK}$	Input Clamp Voltage		$V_{CC} = 4.5V$ , $I_I = -18mA$			-1.5	V		
$V_{OH}$	HIGH Level Output Voltage		$V_{CC} = 4.5V$	$I_{OH} = -2.6mA$	2.4	3.3	V		
				$I_{OH} = -0.4mA$	$V_{CC} - 2$				
$V_{OL}$	LOW Level Output Voltage		$V_{CC} = 4.5V$	$I_{OL} = 12mA$		0.25	0.4	V	
				$I_{OL} = 24mA$		0.35	0.5		
$I_I$	Input Current at 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	$\mu A$		
$I_{IL}$	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		
$I_{OZH}$	OFF-State Output Current, HIGH Level Voltage Applied		$V_{CC} = 5.5V$ , $V_O = 2.7V$			20	$\mu A$		
$I_{OZL}$	OFF-State Output Current, LOW Level Voltage Applied		$V_{CC} = 5.5V$ , $V_O = 0.4V$			-20	$\mu A$		
$I_{CCH}$	Supply Current	DM74ALS257	$V_{CC} = 5.5V$ , Outputs OPEN	Outputs HIGH		3	6	mA	
		DM74ALS258				2.5	4		
$I_{CCL}$	Supply Current	DM74ALS257		$V_{CC} = 5.5V$ , Outputs OPEN	Outputs LOW		8	12	mA
		DM74ALS258					7	11	
$I_{CCZ}$	Supply Current	DM74ALS257	$V_{CC} = 5.5V$ , Outputs OPEN		Outputs Disabled		9	14	mA
		DM74ALS258					8	13	

**Switching Characteristics DM74ALS257**

Over recommended operating free air temperature range.

Symbol	Parameter	Conditions	From	To	Min.	Max.	Units
$t_{PLH}$	Propagation Delay Time, LOW-to-HIGH Level Output	$V_{CC} = 4.5V$ to $5.5V$ , $C_L = 50pF$ , $R_L = 500\Omega$	Data	Any Y	2	10	ns
$t_{PHL}$	Propagation Delay Time, HIGH-to-LOW Level Output		Data	Any Y	2	12	ns
$t_{PLH}$	Propagation Delay Time, LOW-to-HIGH Level Output		Select	Any Y	4	18	ns
$t_{PHL}$	Propagation Delay Time, HIGH-to-LOW Level Output		Select	Any Y	5	22	ns
$t_{ZH}$	Output Enable Time to HIGH Level		Output Control	Any Y	4	16	ns
$t_{ZL}$	Output Enable Time to LOW Level		Output Control	Any Y	5	18	ns
$t_{HZ}$	Output Disable Time from HIGH Level		Output Control	Any Y	2	10	ns
$t_{LZ}$	Output Disable Time from LOW Level		Output Control	Any Y	3	15	ns

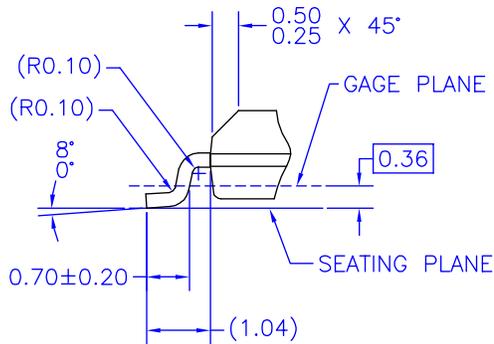
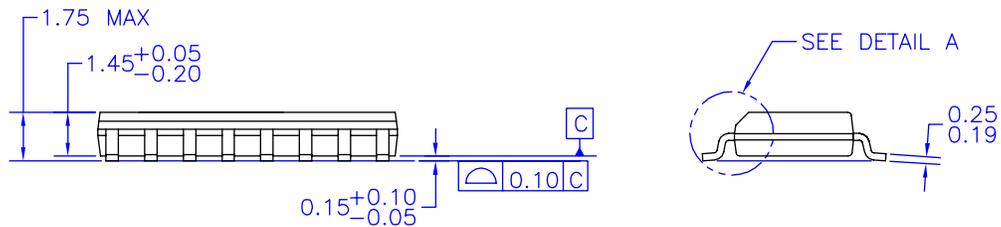
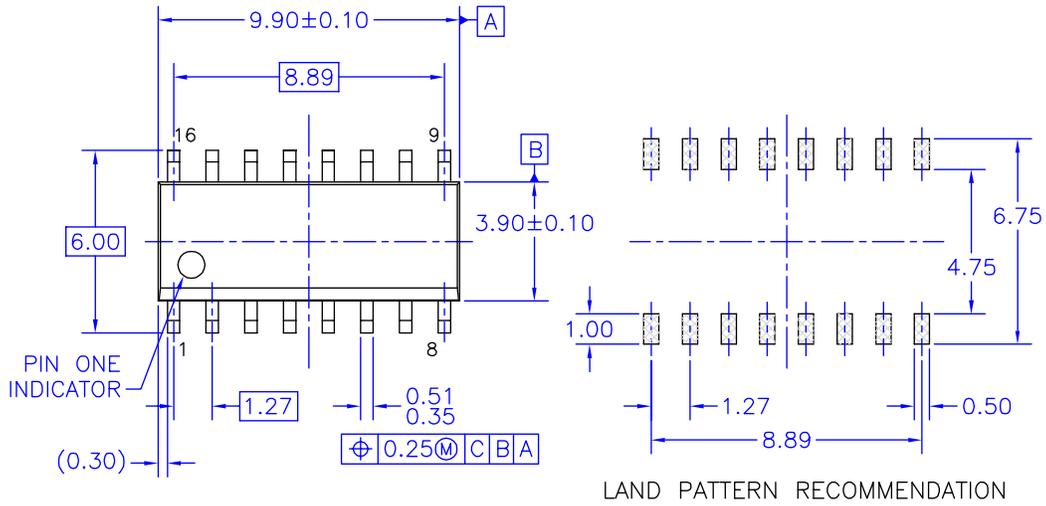
**Switching Characteristics DM74ALS258**

Over recommended operating free air temperature range.

Symbol	Parameter	Conditions	From	To	Min.	Max.	Units
$t_{PLH}$	Propagation Delay Time, LOW-to-HIGH Level Output	$V_{CC} = 4.5V$ to $5.5V$ , $C_L = 50pF$ , $R_L = 500\Omega$	Data	Any Y	2	8	ns
$t_{PHL}$	Propagation Delay Time, HIGH-to-LOW Level Output		Data	Any Y	2	7	ns
$t_{PLH}$	Propagation Delay Time, LOW-to-HIGH Level Output		Select	Any Y	3	20	ns
$t_{PHL}$	Propagation Delay Time, HIGH-to-LOW Level Output		Select	Any Y	5	25	ns
$t_{ZH}$	Output Enable Time to HIGH Level		Output Control	Any Y	5	18	ns
$t_{ZL}$	Output Enable Time to LOW Level		Output Control	Any Y	5	18	ns
$t_{HZ}$	Output Disable Time from HIGH Level		Output Control	Any Y	2	10	ns
$t_{LZ}$	Output Disable Time from LOW Level		Output Control	Any Y	3	18	ns

## Physical Dimensions

Dimensions are in millimeters unless otherwise noted.



**DETAIL A**  
SCALE: 2:1

NOTES: UNLESS OTHERWISE SPECIFIED

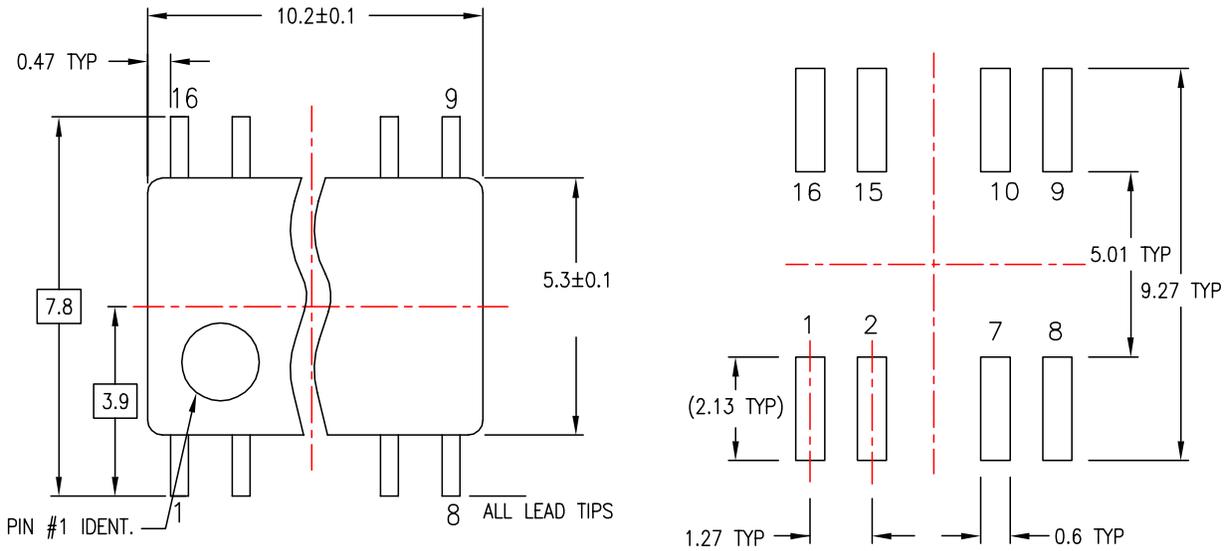
- A) THIS PACKAGE CONFORMS TO JEDEC MS-012, VARIATION AC, ISSUE C, DATED MAY 1990.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS.
- D) STANDARD LEAD FINISH:  
200 MICRONS / 5.08 MICRONS MIN.  
LEAD/TIN (SOLDER) ON COPPER.

M16AREVK

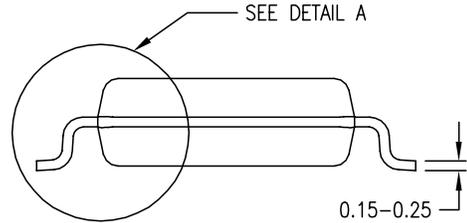
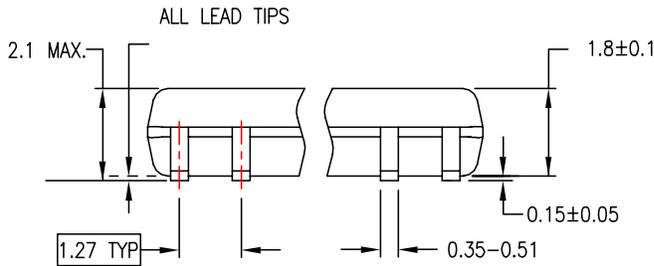
**Figure 1. 16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow Package Number M16A**

**Physical Dimensions** (Continued)

Dimensions are in millimeters unless otherwise noted.



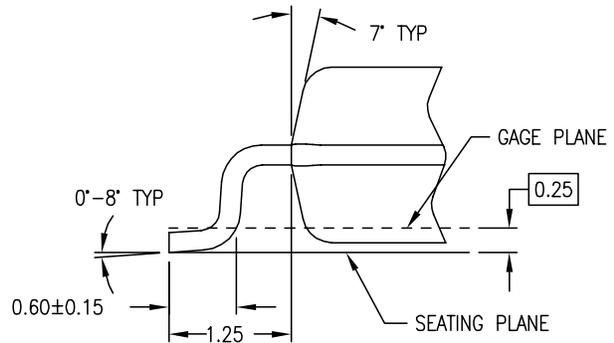
LAND PATTERN RECOMMENDATION



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.



DETAIL A

M16DREVC

**Figure 2. 16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide Package Number M16D**



## TRADEMARKS

The following are registered and unregistered trademarks and service marks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks

ACEx®	Green FPS™ e-Series™	Power-SPM™	SyncFET™
Build it Now™	GTO™	PowerTrench®	The Power Franchise®
CorePLUS™	<i>i-Lo</i> ™	Programmable Active Droop™	 ™
CROSSVOLT™	IntelliMAX™	QFET®	TinyBoost™
CTL™	ISOPLANAR™	QS™	TinyBuck™
Current Transfer Logic™	MegaBuck™	QT Optoelectronics™	TinyLogic®
EcoSPARK®	MICROCOUPLER™	Quiet Series™	TINYOPTO™
FACT Quiet Series™	MicroPak™	RapidConfigure™	TinyPower™
FACT®	Motion-SPM™	SMART START™	TinyPWM™
FAST®	OPTOLOGIC®	SPM®	TinyWire™
FastvCore™	OPTOPLANAR®	STEALTH™	μSerDes™
FPS™	PDP-SPM™	SuperFET™	UHC®
FRFET®	Power220®	SuperSOT™-3	UniFET™
Global Power Resource™	Power247®	SuperSOT™-6	VCX™
Green FPS™	POWEREDGE®	SuperSOT™-8	

## DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

## LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

- Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
- A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

## PRODUCT STATUS DEFINITIONS

### Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.

Rev. I28