

## DM74ALS1240A Octal 3-STATE Bus Driver

### General Description

These octal 3-STATE bus drivers are designed to provide the designer with flexibility in implementing a bus interface with memory, microprocessor, or communication systems, and are low power dissipation versions of the DM74ALS240A and DM74ALS241A. The output 3-STATE gating control is organized into two separate groups of four buffers. The DM74ALS1240A control inputs symmetrically enable the respective outputs when set logic LOW. The 3-STATE circuitry contains a feature that maintains the buffer outputs in 3-STATE (high impedance state) during power supply ramp-up or ramp-down. This eliminates bus glitching problems that arise during power-up and power-down.

### Features

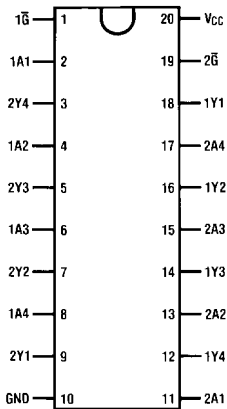
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Switching response specified into 500Ω and 50 pF load
- Switching response specifications guaranteed over full temperature and  $V_{CC}$  supply range
- PNP input design reduces input loading
- Low power dissipation version
- Low level drive current: 74ALS = 16 mA

### Ordering Code:

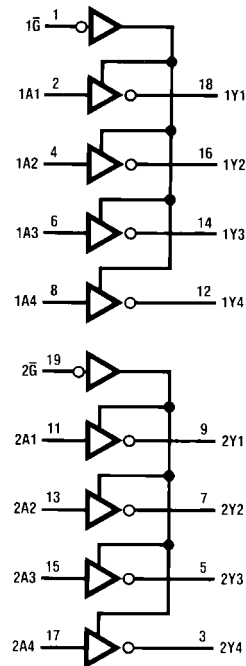
Order Number	Package Number	Package Description
DM74ALS1240AWM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide

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

### Connection Diagram



### Logic Diagram



### Function Table

Input		Output
G	A	Y
L	L	H
L	H	L
H	X	Z

H = HIGH Level Logic State  
L = LOW Level Logic State  
X = Don't Care (Either LOW or HIGH Level Logic State)  
Z = High Impedance (OFF) State

**Absolute Maximum Ratings**(Note 1)

Supply Voltage	7V
Input Voltage	7V
Voltage Applied to Disabled Output	5.5V
Operating Free Air Temperature Range	0°C to +70°C
Storage Temperature Range	-65°C to +150°C
Typical $\theta_{JA}$	
N Package	60.5°C/W
M Package	78.0°C/W

**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	Typ	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			-15	mA
$I_{OL}$	LOW Level Output Current			16	mA
$T_A$	Operating Free Air Temperature	0		70	°C

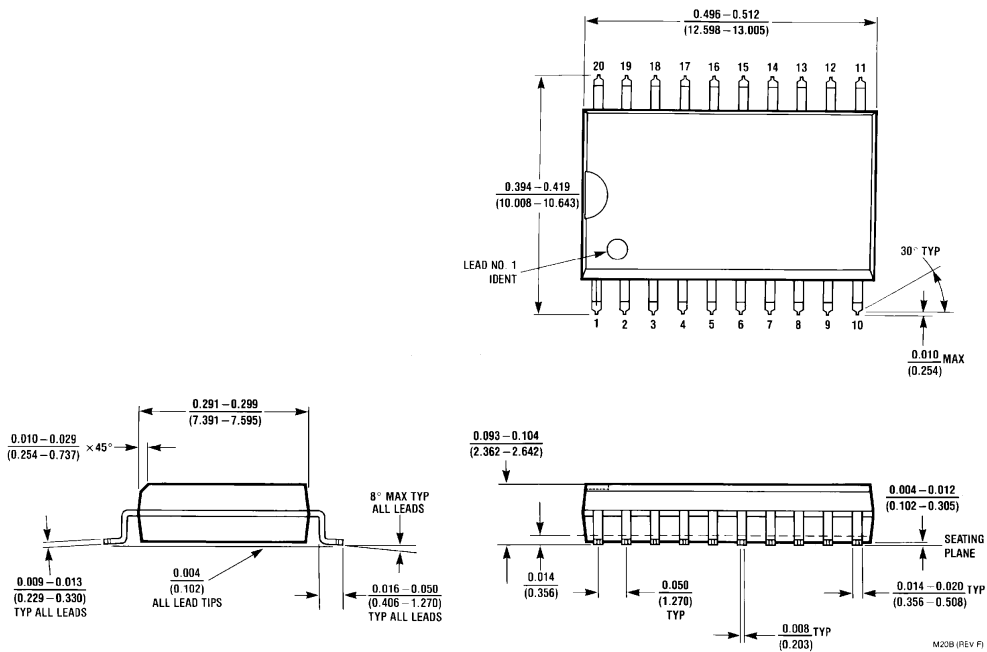
**Electrical Characteristics**

over recommended operating free air temperature range (unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{IK}$	Input Clamp Voltage	$V_{CC} = 4.5V, I_I = -18\text{ mA}$			-1.2	V
$V_{OH}$	HIGH Level Output Voltage	$V_{CC} = 4.5V\text{ to }5.5V$	$I_{OH} = -0.4\text{ mA}$	$V_{CC} - 2$		V
		$V_{CC} = 4.5V$	$I_{OH} = -3\text{ mA}$	2.4		V
			$I_{OH} = \text{Max}$	2		V
$V_{OL}$	LOW Level Output Voltage	$V_{CC} = 4.5V$	$I_{OL} = 12\text{ mA}$	0.25	0.4	V
			$I_{OL} = 24\text{ mA}$	0.35	0.5	V
$I_I$	Input Current at Maximum Input Voltage	$V_{CC} = 5.5V, V_I = 7V$			0.1	mA
$I_{IH}$	HIGH Level Input Current	$V_{CC} = 5.5V, V_I = 2.7V$			20	$\mu\text{A}$
$I_{IL}$	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
$I_{OZH}$	HIGH Level 3-STATE Output Current	$V_{CC} = 5.5V, V_O = 2.7V$			20	$\mu\text{A}$
$I_{OZL}$	LOW Level 3-STATE Output Current	$V_{CC} = 5.5V, V_O = 0.4V$			-20	$\mu\text{A}$
$I_{CC}$	Supply Current	$V_{CC} = 5.5V$	Outputs HIGH	5	8	mA
			Outputs LOW	8	14	mA
		Outputs 3-STATE	8	13	mA	

<b>Switching Characteristics</b>						
over recommended operating free air temperature range						
Symbol	Parameter	From (Input)	To (Output)	V <sub>CC</sub> = 4.5V to 5.5V, C <sub>L</sub> = 50 pF, R1 = 500Ω, R2 = 500Ω, T <sub>A</sub> = Min to Max		Units
				Min	Max	
t <sub>PLH</sub>	Propagation Delay Time LOW-to-HIGH Level Output	A	Y	2	13	ns
t <sub>PHL</sub>	Propagation Delay Time HIGH-to-LOW Level Output			2	13	ns
t <sub>PZH</sub>	Output Enable Time to HIGH Level Output	$\bar{G}$	Y	4	20	ns
t <sub>PZL</sub>	Output Enable Time to LOW Level Output			6	22	ns
t <sub>PHZ</sub>	Output Disable Time from HIGH Level Output	$\bar{G}$	Y	2	10	ns
t <sub>PLZ</sub>	Output Disable Time from LOW Level Output			3	13	ns

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



**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide  
Package Number M20B**

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