

September 1986 Revised February 2000

DM74ALS244A Octal 3-STATE Bus Driver

General Description

This octal 3-STATE bus driver is designed to provide the designer with flexibility in implementing a bus interface with memory, microprocessor, or communication systems. This device offers 64-extended temperature Grade product guaranteeing performance from -40°C to $+85^{\circ}\text{C}$. The output 3-STATE gating control is organized into two separate groups of four buffers, and both control inputs 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

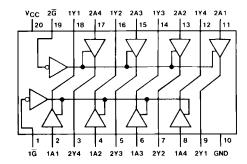
- Advanced low power oxide-isolated ion-implanted Schottky TTL process
- Functional and pin compatible with the 74LS counterpart
- Improved switching performance with less power dissipation compared with the 74LS counterpart
- \blacksquare Switching response specified into 500 $\!\Omega$ and 50 pF load
- Switching response specifications guaranteed over full temperature and V_{CC} supply range
- PNP input design reduces input loading

Ordering Code:

Order Number	r Number Package Number Package Description					
DM74ALS244AWM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide				
DM74ALS244ASJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide				
DM74ALS244AMSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide				
DM74ALS244AN	N20A	20-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

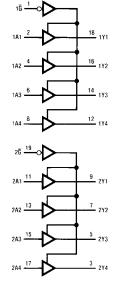


Function Table

Inp	out	Output
G	Α	Y
L	L	L
L	Н	Н
Н	Х	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

Logic Diagram



Absolute Maximum Ratings(Note 1)

7V Input Voltage 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 θ_{JA}

Supply Voltage, V_{CC}

N Package 60.5°C/W

79.8°C/W M Package

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	Тур	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
Гон	HIGH Level Output Current			-15	mA
I _{OL}	LOW Level Output Current			24	mA
T _A	Operating Free-Air Temperature	0		70	°C

7V

Electrical Characteristics

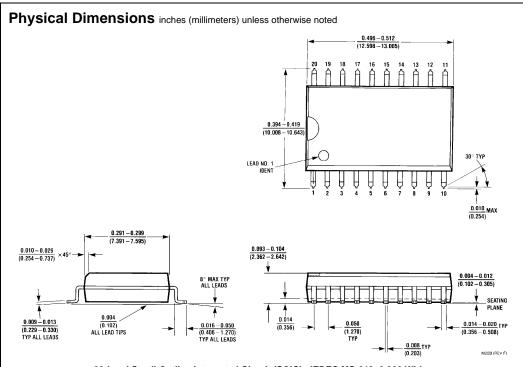
over recommended operating free air temperature (unless otherwise specified)

Symbol	Parameter	$\label{eq:conditions} V_{CC} = 4.5 \text{V, } I_I = -18 \text{ mA}$		Min	Тур	Max	Units
V _{IK}	Input Clamp Voltage					-1.5	V
V _{OH}	HIGH Level	V _{CC} = 4.5V to 5.5V	$I_{OH} = -0.4 \text{ mA}$	V _{CC} -2			V
	Output Voltage	V _{CC} = 4.5V	$I_{OH} = -3 \text{ mA}$	2.4			V
			I _{OH} = Max	2			V
V _{OL}	LOW Level	V _{CC} = 4.5V	•		0.35	0.5	V
	Output Voltage	$I_{OL} = 24 \text{ mA}$			0.35	0.5	V
II	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	μΑ
I _{IL}	LOW Level Input Current	$V_{CC} = 5.5V, V_{IL} = 0.4V$				-0.1	mA
Io	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	μΑ
I _{OZL}	LOW Level 3-STATE Output Current	$V_{CC} = 5.5V, V_{O} = 0.4V$				-20	μΑ
Icc	Supply Current	V _{CC} = 5.5V			9	15	mA
		Outputs HIGH			9	15	IIIA
		Outputs LOW			15	24	mA
		Outputs 3-STATE			17	27	mA

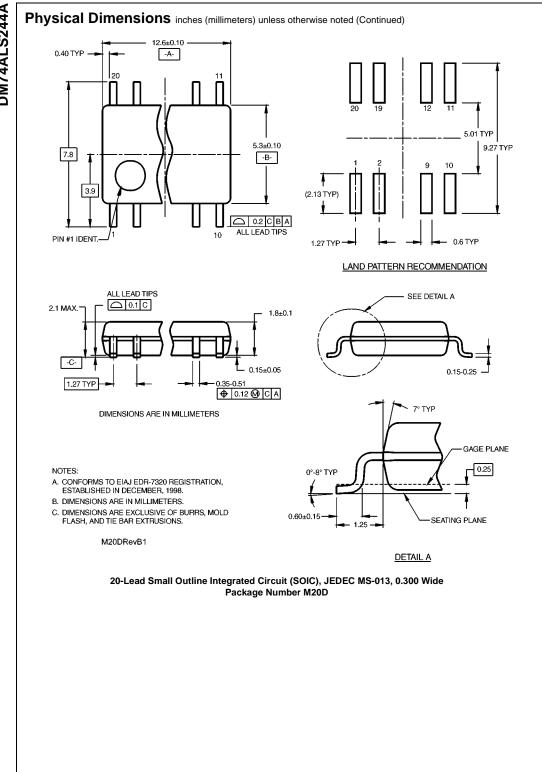
Switching Characteristics

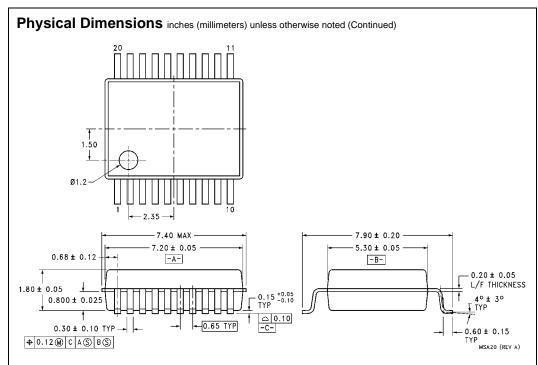
over recommended operating free-air temperature range

Symbol	Parameter	Conditions	From (Input)	To (Output)	Min	Max	Units
t _{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	$V_{CC} = 4.5V \text{ to } 5.5V,$ $C_{L} = 50 \text{ pF},$	А	Y	3	10	ns
t _{PHL}	Propagation Delay Time HIGH-to-LOW Level Output	$R1 = 500\Omega,$ $R2 = 500\Omega,$	А	Y	3	10	ns
t _{PZH}	Output Enable Time to HIGH Level Output	T _A = Min to Max	G	Υ	3	20	ns
t _{PZL}	Output Enable Time to LOW Level Output		G	Y	3	20	ns
t _{PHZ}	Output Disable Time from HIGH Level Output		G	Y	2	10	ns
t _{PLZ}	Output Disable Time from LOW Level Output		G	Υ	1	13	ns

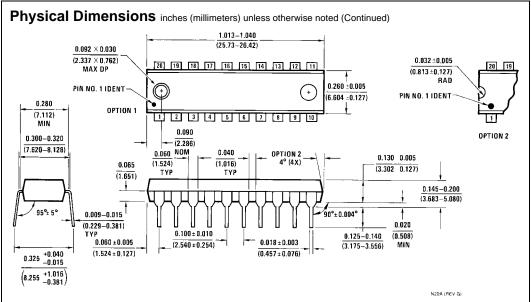


20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide Package Number M20B





20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide Package Number MSA20



20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N20A

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