

## DM54ALS1245A/DM74ALS1245A TRI-STATE® Bus Transceivers

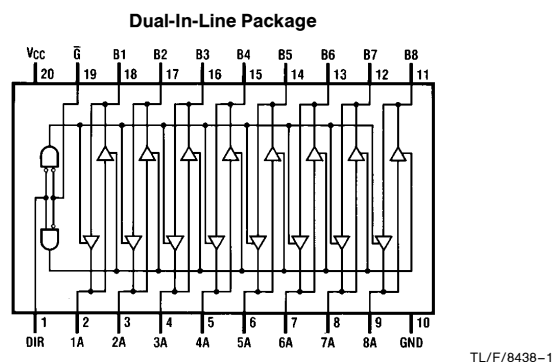
### General Description

This advanced low power Schottky device contains 8 pairs of TRI-STATE logic elements configured as octal bus transceivers. This circuit is designed for use in memory, micro-processor systems and in asynchronous bidirectional data buses. Two way communication between buses is controlled by the (DIR) input. Data either transmits from the A bus to the B bus or from the B bus to the A bus. Both the driver and receiver outputs can be disabled via the ( $\bar{G}$ ) enable input which causes outputs to enter the high impedance mode, so that the buses are effectively isolated. The TRI-STATE circuitry also contains a protection feature that prevents the buffer from glitching the bus during power-up or power-down.

### Features

- Low power version of ALS245A
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Low output impedance to drive terminated transmission lines to 133 $\Omega$
- Switching response specified into 500 $\Omega$ /50 pF
- Switching specifications guaranteed over full temperature and  $V_{CC}$  range

### Connection Diagram



Order Number DM54ALS1245AJ, DM74ALS1245AWM or DM74ALS1245AN  
See NS Package Number J20A, M20B or N20A

### Function Table

Control Inputs		Operation
$\bar{G}$	DIR	
L	L	B Data to A Bus
L	H	A Data to B Bus
H	X	Hi-Z

L = Low Logic Level, H = High Logic Level

X = Either Low or High Logic Level

Hi-Z = High Impedance (off) State

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## Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage, $V_{CC}$	7V
Input Voltage	
Control Inputs	7V
I/O Ports	5.5V

Operating Free Air Temperature Range	
DM54ALS	−55°C to +125°C
DM74ALS	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

Note: 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" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

## Recommended Operating Conditions


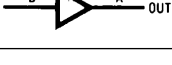

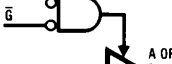
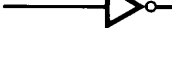
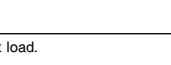
Symbol	Parameter	DM54ALS1245A			DM74ALS1245A			Units
		Min	Typ	Max	Min	Typ	Max	
$V_{CC}$	Supply Voltage	4.5	5	5.5	4.5	5	5.5	V
$V_{IH}$	High Level Input Voltage	2			2			V
$V_{IL}$	Low Level Input Voltage			0.7			0.8	V
$I_{OH}$	High Level Output Current			−12			−15	mA
$I_{OL}$	Low Level Output Current			8			16	mA
$T_A$	Operating Free Air Temperature Range	−55		125	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	DM54ALS1245A			DM74ALS1245A			Units
			Min	Typ	Max	Min	Typ	Max	
$V_{IK}$	Input Clamp Voltage	$V_{CC} = 4.5V$ , $I_{IN} = -18\text{ mA}$			−1.5			−1.5	V
$V_{OH}$	High Level Output Voltage	$V_{CC} = 4.5V$ , $I_{OH} = -3\text{ mA}$	2.4	3.2		2.4	3.2		V
		$V_{CC} = 4.5V$ , $I_{OH} = \text{Max}$	2	2.3		2	2.3		V
		$I_{OH} = -0.4\text{ mA}$ , $V_{OL} = 4.5V\text{ to }5.5V$	$V_{CC} - 2$			$V_{CC} - 2$			V
$V_{OL}$	Low Level Output Voltage	$V_{CC} = 4.5V$	$I_{OL} = 8\text{ mA}$	0.25	0.4		0.25	0.4	V
			$I_{OL} = 16\text{ mA}$				0.35	0.5	V
$I_I$	Input Current at Max Input Voltage	$V_{CC} = 5.5V$ , $V_{IN} = 7V$ ( $V_{IN} = 5.5V$ for A or B Ports)			0.1			0.1	mA
$I_{IH}$	High Level Input Current	$V_{CC} = 5.5V$ , $V_{IN} = 2.7V$			20			20	$\mu A$
$I_{IL}$	Low Level Input Current	$V_{CC} = 5.5V$ , $V_{IN} = 0.4V$			−0.1			−0.1	mA
$I_O$	Output Drive Current	$V_{CC} = 5.5V$ , $V_O = 2.25V$	−30		−112	−30		−112	mA
$I_{CC}$	Supply Current	$V_{CC} = 5.5V$	Outputs High	21	33		21	30	mA
			Outputs Low	23	36		23	33	mA
			TRI-STATE	25	40		25	36	mA

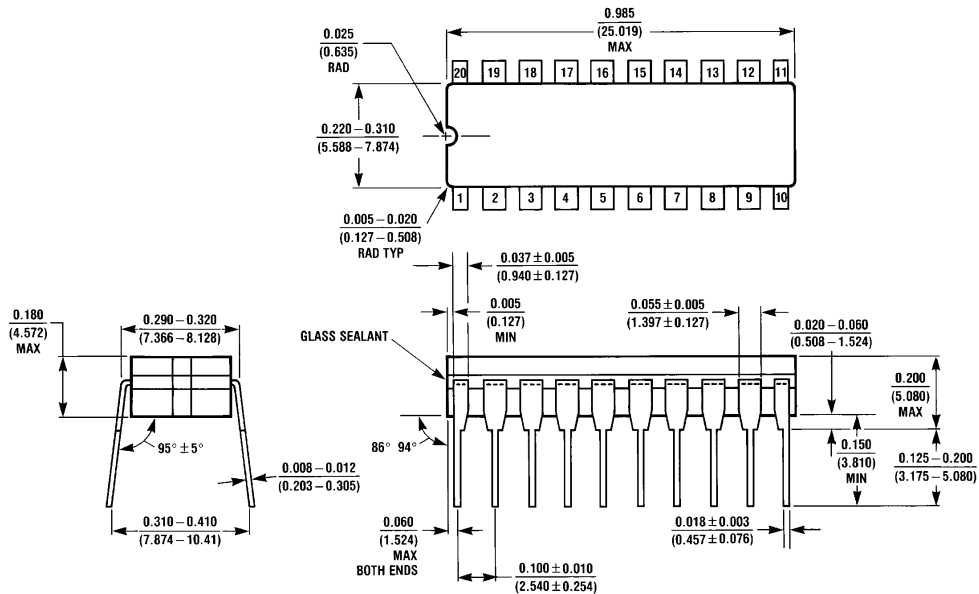
## Switching Characteristics over recommended operating free air temperature range (Notes 1 and 2)

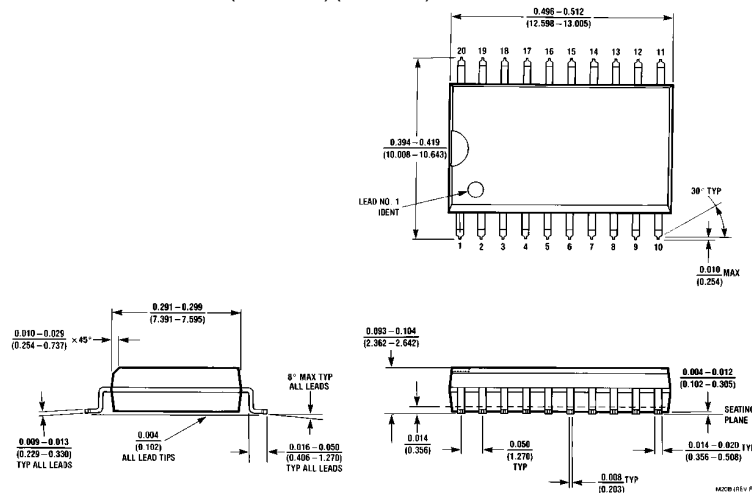
Symbol	Parameter	Circuit Configuration	DM54ALS1245A		DM74ALS1245A		Units
			Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay Time Low to High Level Output		2	19	2	13	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output		2	15	2	13	ns
$t_{PZL}$	Output Enable Time to Low Level Output		8	29	8	25	ns
$t_{PZH}$	Output Enable Time to High Level Output		8	30	8	25	ns
$t_{PLZ}$	Output Disable Time from Low Level Output		3	30	3	18	ns
$t_{PHZ}$	Output Disable Time from High Level Output		2	14	2	12	ns

**Note 1:** See Section 5 for test waveforms and output load.

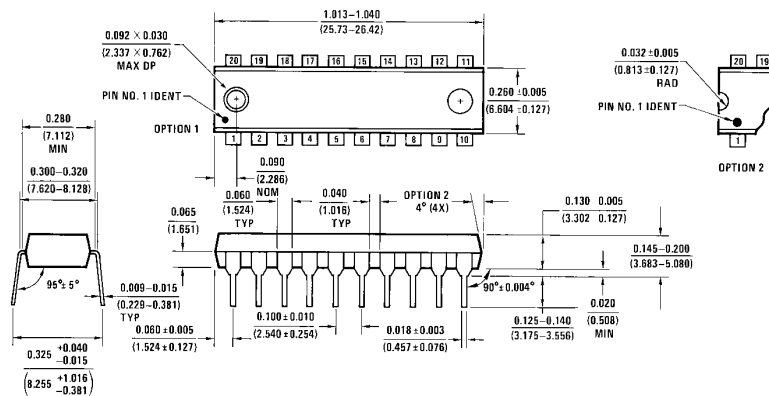
**Note 2:** Switching characteristic conditions are  $V_{CC} = 4.5V$  to  $5.5V$ ,  $R_L = 500\Omega$ ,  $C_L = 50$  pF.

## Physical Dimensions inches (millimeters)



**Physical Dimensions** inches (millimeters) (Continued)

**S.O. Package (M)**  
**Order Number DM74ALS1245AWM**  
**NS Package Number M20B**



**Molded Dual-In-Line Package (N)**  
**Order Number DM74ALS1245AN**  
**NS Package Number N20A**

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