

DM54ALS1245A/DM74ALS1245A TRI-STATE® Bus Transceivers

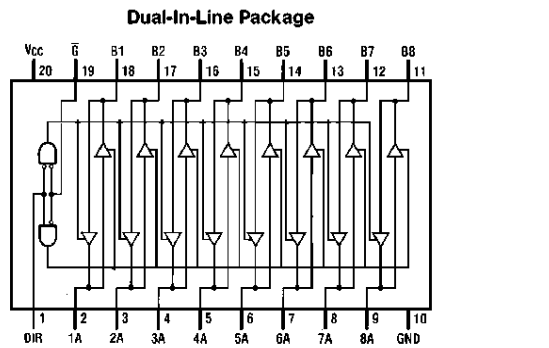
General Description

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, microprocessor 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 Ω
- Switching response specified into 500 Ω /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	$V_{CC} = 4.5V$, $I_{IN} = -18 mA$			-1.5			-1.5	V	
V_{OH}	High Level Output Voltage	$V_{CC} = 4.5V$, $I_{OH} = -3 mA$	2.4	3.2		2.4	3.2		V	
		$V_{CC} = 4.5V$, $I_{OH} = Max$	2	2.3		2	2.3		V	
		$I_{OH} = -0.4 mA$, $V_{OL} = 4.5V$ to $5.5V$	$V_{CC} - 2$			$V_{CC} - 2$			V	
V_{OL}	Low Level Output Voltage	$V_{CC} = 4.5V$	$I_{OL} = 8 mA$	0.25	0.4		0.25	0.4	V	
			$I_{OL} = 16 mA$				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	μA	
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

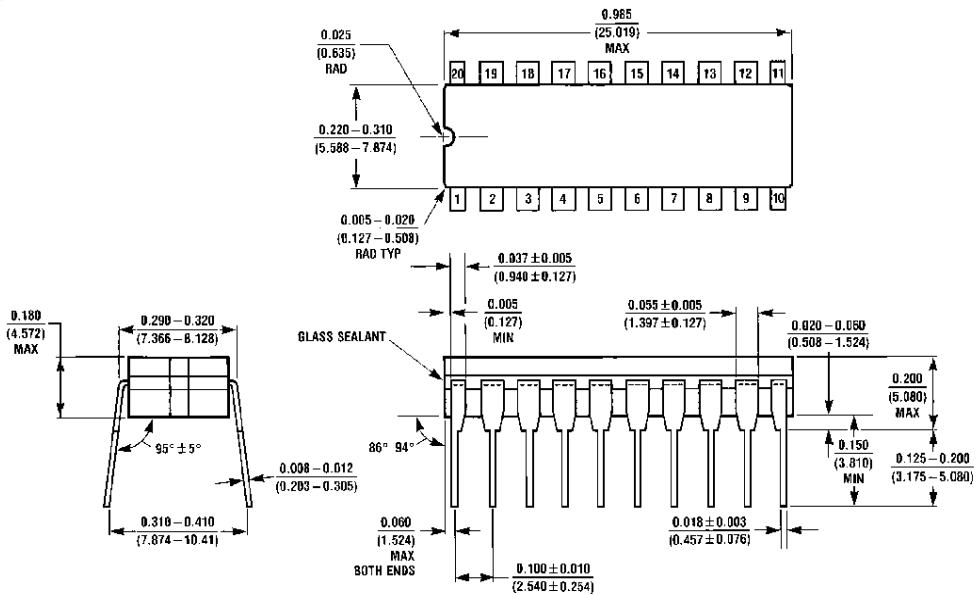
Switching Characteristics over recommended operating free air temperature range (Notes 1 and 2)

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

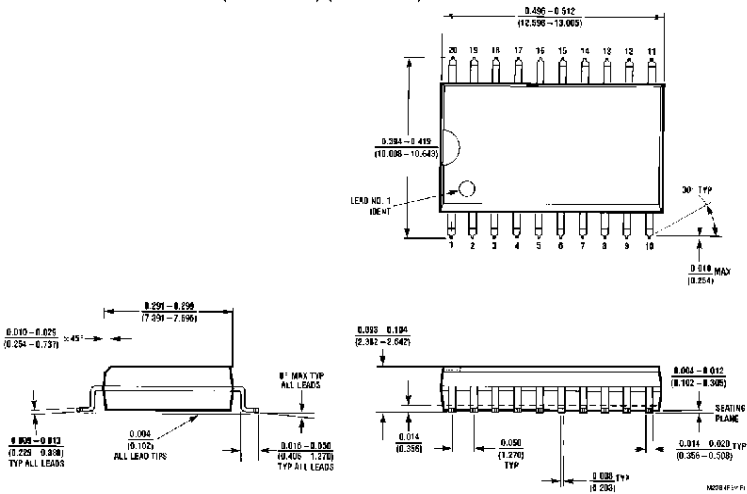
Note 1: See Section 5 for test waveforms and output load.

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

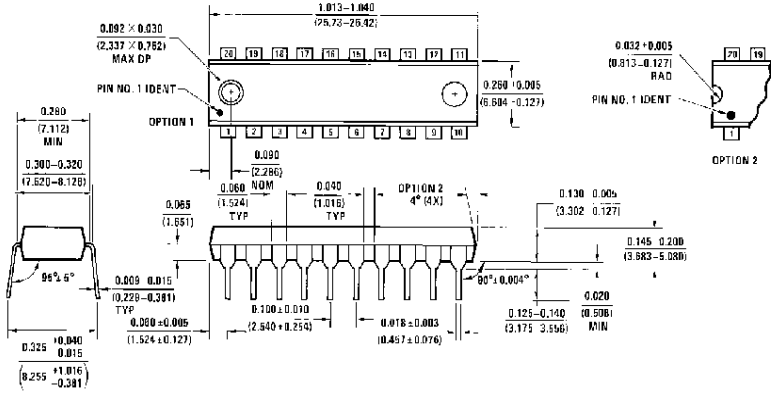
Physical Dimensions inches (millimeters)



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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