

## DM74ALS645A Octal Bus Transceivers

### General Description

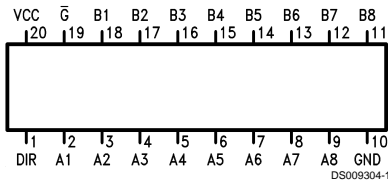
These octal bus transceivers are designed for asynchronous two-way communication between data buses. These devices transmit data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction control (DIR) input. The enable input (G) can be used to disable the device so the busses are effectively isolated.

- Switching performance is guaranteed over full temperature and  $V_{CC}$  supply range
- Switching performance specified at 50 pF
- PNP input design reduces input loading

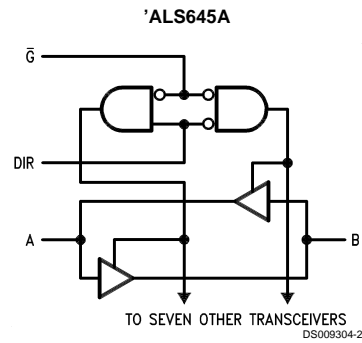
### Features

- Advanced Oxide-isolated Ion-implanted Schottky TTL process

### Connection and Logic Diagrams



Order Number DM74ALS645AWM or DM74ALS645AN  
See Package Number 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	Isolation

Low = Low Logic Level  
High = High Logic Level  
X = Either Low or High Logic Level

### Absolute Maximum Ratings (Note 1)

Supply Voltage	7V	DM74ALS	0°C to +70°C
Input Voltage; Control Inputs	7V	Storage Temperature Range	-65°C to +150°C
I/O ports	5.5V	Typical $\theta_{JA}$	
Operating Free Air Temperature Range		N Package	53.0°C/W
		M Package	72.0°C/W

### Recommended Operating Conditions

Symbol	Parameter	DM74ALS645A			Units
		Min	Typ	Max	
$V_{CC}$	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			24	mA
$T_A$	Operating Free Air Temperature Range	0		70	°C

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

### Electrical Characteristics

Over Recommended Free Air Temperature Range

Symbol	Parameter	Test Conditions	DM74ALS645A			Units	
			Min	Typ	Max		
$V_{IC}$	Input Clamp Voltage	$V_{CC} = \text{Min}, I_I = -18 \text{ mA}$			-1.5	V	
$V_{OH}$	High Level Output Voltage	$V_{CC} = 4.5 \text{ to } 5.5\text{V}$	$I_{OH} = -0.4 \text{ mA}$	$V_{CC} - 2$		V	
		$V_{CC} = \text{Max}$	$I_{OH} = -3 \text{ mA}$	2.4	3.2		
			$I_{OH} = \text{Max}$	2			
$V_{OL}$	Low Level Output Voltage	$V_{CC} = \text{Min}$	$I_{OL} = 12 \text{ mA}$		0.25	0.4	V
			$I_{OL} = 24 \text{ mA}$		0.35	0.5	
$I_I$	Input Current at Maximum Input Voltage	$V_{CC} = \text{Max}$	I/O Ports, $V_I = 5.5\text{V}$			100	$\mu\text{A}$
			Control Inputs, $V_I = 7\text{V}$			100	
$I_{IH}$	High Level Input Current	$V_{CC} = \text{Max}, V_I = 2.7\text{V}$ (Note 2)				20	$\mu\text{A}$
$I_{IL}$	Low Level Input Current	$V_{CC} = \text{Max}, V_I = 0.4\text{V}$ (Note 2)				-100	$\mu\text{A}$
$I_O$	Output Drive Current	$V_{CC} = \text{Max}, V_O = 2.25\text{V}$		-30		-112	mA
$I_{CC}$	Supply Current	$V_{CC} = \text{Max}$	Outputs High		30	45	mA
			Outputs Low		36	55	
			Outputs Disabled		38	58	

**Note 2:** For I/O ports,  $I_{IH}$  and  $I_{IL}$  parameters include the 3-STATE output current ( $I_{OZL}$  and  $I_{OZH}$ ).

## Switching Characteristics

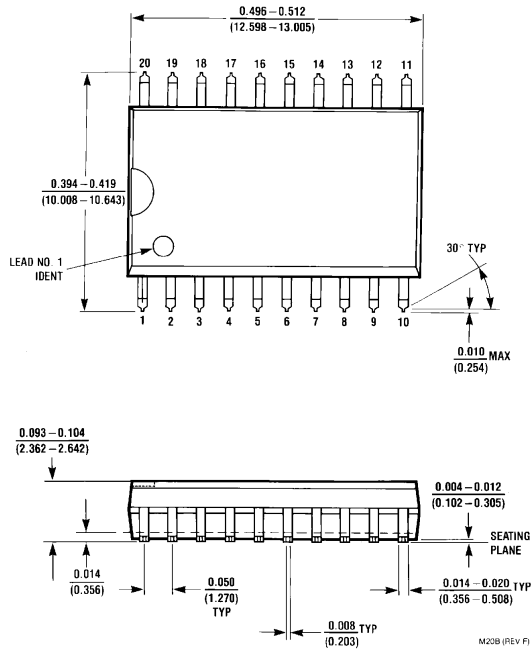
Over Recommended Operating Free Air Temperature Range (Note 3)

Symbol	Parameter	From (Input)	To (Output)	Conditions	DM74ALS645A		Units
					Min	Max	
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output	A or B	B or A	V <sub>CC</sub> = 4.5 to 5.5V, C <sub>L</sub> = 50 pF, R1 = R2 = 500Ω	3	10	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output	A or B	B or A		3	10	ns
t <sub>PZH</sub>	Output Enable Time to High Level Output	$\bar{G}$	A or B		5	20	ns
t <sub>PZL</sub>	Output Enable Time to Low Level Output	$\bar{G}$	A or B		5	20	ns
t <sub>PHZ</sub>	Output Disable Time from High Level Output	$\bar{G}$	A or B		2	10	ns
t <sub>PLZ</sub>	Output Disable Time from Low Level Output	$\bar{G}$	A or B		4	15	ns

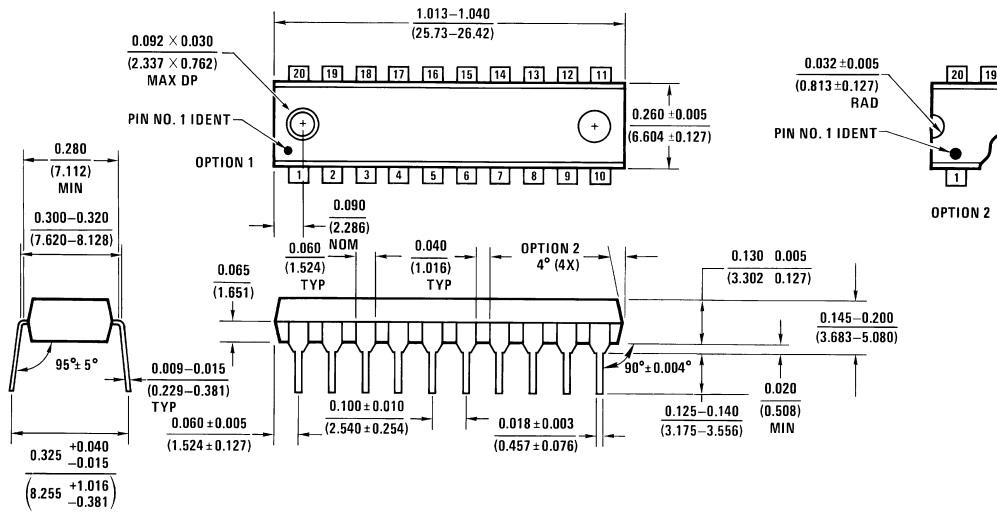
**Note 3:** See Section 5 for test waveforms and output load.



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



**SO Package (M)**  
**Order Number DM74ALS645A WM**  
**Package Number M20B**



**Molded Dual-In-Line Package (N)**  
**Order Number DM74ALS645AN**  
**Package Number N20A**

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