

DM74ALS245A Octal TRI-STATE® Bus Transceiver

General Description

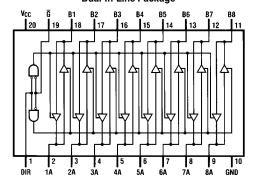
This advanced low power Schottky device contains 8 pairs of TRI-STATE logic elements configured as octal bus transceivers. These circuits are designed for use in memory, microprocessor systems and in asynchronous bidirectional data buses. Two way communication between buses is controlled by the (DIR) input. Data transmits either 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 $\overline{\rm (G)}$ enable input which causes outputs to enter the high impedance mode so that the buses are effectively isolated.

Features

- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Non-inverting logic output
- Glitch free bus during power up and down
- TRI-STATE outputs independently controlled on A and B buses
- \blacksquare Low output impedance to drive terminated transmission lines to 133 $\!\Omega$
- Switching response specified into 500 \Omega/50 pF
- \blacksquare Specified to interface with CMOS at $V_{OH} = V_{CC} 2V$
- PNP inputs to reduce input loading
- \blacksquare Switching specifications guaranteed over full temperature and V_{CC} range

Connection Diagram

Dual-In-Line Package



TL/F/6213-1

Order Number DM74ALS245MSA, DM74ALS245AWM, DM74ALS245AN or DM74ALS245ASJ See NS Package Number M20B, M20D, MQA20 or N20A

Function Table

| Control Inputs | | Operation | | |
|-------------------|-----|-----------------|--|--|
| G | DIR | | | |
| L | L | B Data to A Bus | | |
| L | Н | A Data to B Bus | | |
| Н | Х | Hi-Z | | |

H = High Logic Level

 $\mathsf{L} = \mathsf{Low} \; \mathsf{Logic} \; \mathsf{Level}$

X = Either High or Low Logic Level

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Absolute Maximum Ratings

 Supply Voltage
 7V

 Input Voltage
 7V

 Control Inputs
 7V

 I/O Ports
 5.5V

Operating Free Air Temperature Range
DM74ALS
0°C to +70°C

Storage Temperature Range -65°C to +150°C

Typical $\theta_{\rm JA}$ N Package 53.0°C/W M Package 72.0°C/W

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 | DM74ALS245A | | | Units |
|-----------------|-----------------------------------|-------------|-----|------------|--------|
| | | Min | Тур | Max | Office |
| V _{CC} | Supply Voltage | 4.5 | 5 | 5.5 | ٧ |
| V_{IH} | High Level Input Voltage | 2 | | | ٧ |
| V_{IL} | Low Level Input Voltage | | | 0.8 | ٧ |
| I _{OH} | High Level Output Current | | | -15 | mA |
| I _{OL} | Low Level Output Current | | | 24 | mA |
| T _A | Operating Free Air Temperature | 0 | | 70 | °C |

Electrical Characteristics

over recommended operating free air temperature range. All typical values are measured at $V_{CC}=5V$, $T_A=25^{\circ}C$.

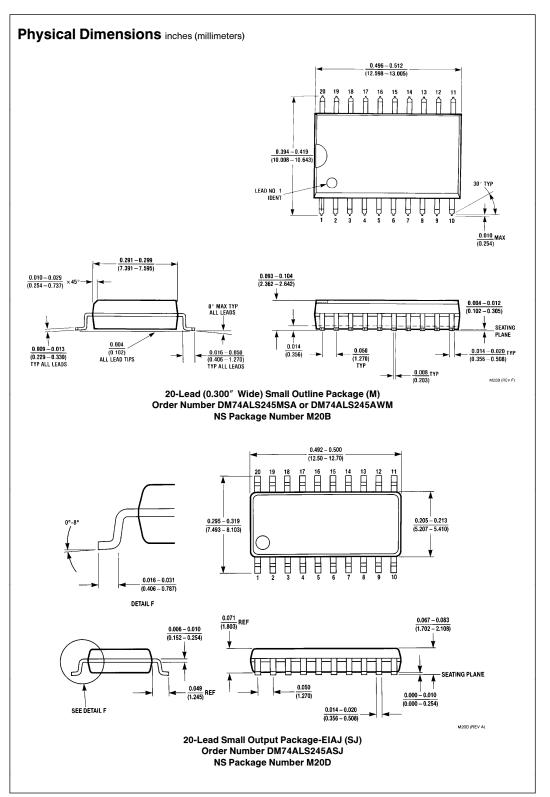
| | <u> </u> | | • • • • | | | . , , | | |
|-----------------|---------------------------|--|-------------------------|----------------|---------------------|-------|-------|------|
| Symbol | Parameter | Conditions | | Min | Тур | Max | Units | |
| V _{IK} | Input Clamp Voltage | $V_{CC} = 4.5V, I_{IN} = -18 \text{ mA}$ | | | | | -1.5 | V |
| V _{OH} | High Level Output Voltage | $V_{CC} = 4.5V, I_{OH} = -3 \text{ mA}$ | | | 2.4 | 3.2 | | V |
| | | $V_{CC} = 4.5V$, $I_{OH} = Max$ | | | 2 | 2.3 | | V |
| | | $I_{OH} = -0.4 \text{ mA}, V_{CC} = 4.5 \text{V to } 5.5 \text{V}$ | | | V _{CC} – 2 | | | V |
| V _{OL} | Low Level Output Voltage | $V_{CC} = 4.5V$ | I _{OL} = 24 mA | | | 0.35 | 0.5 | V |
| -I _I | Input Current at Max | $V_{CC} = 5.5V$ | $V_{IN} = 7V$ | Control Inputs | | | 0.1 | mA |
| | Input Voltage | age | V _{IN} = 5.5V | A or B Ports | | | 0.1 | IIIA |
| I _{IH} | High Level Input Current | $V_{CC} = 5.5V, V_{IN} = 2.7V$ | | | | 20 | μΑ | |
| I _{IL} | Low Level Input Current | $V_{CC} = 5.5V, V_{IN} = 0.4V$ | | | | -0.1 | mA | |
| l _o | Output Drive Current | $V_{CC} = 5.5V, V_{OUT} = 2.25V$ | | | -30 | | -112 | mA |
| Icc | Supply Current | $V_{CC} = 5.5V$ | Outputs High | | | 30 | 45 | mA |
| | | | Outputs Low | | | 36 | 55 | mA |
| | | | TRI-STATE | | | 38 | 58 | mA |

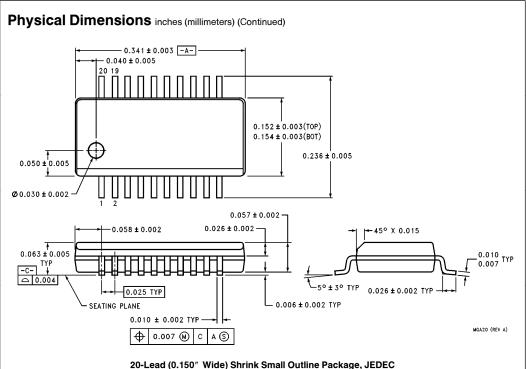
Switching Characteristics over recommended operating free air temperature range (Notes 1 and 2)

| Symbol | Parameter | Circuit | DM74AL | Units | |
|------------------|--|--------------------|--------|-------|---------|
| | | Configuration | Min | Max | - Cillo |
| t _{PLH} | Propagation Delay Time Low-to-High Level Output | | 3 | 10 | ns |
| t _{PHL} | Propagation Delay Time High-to-Low Level Output | IN A OR B OB A OUT | 3 | 10 | ns |
| t _{PZL} | Output Enable Time to Low Level | | 5 | 20 | ns |
| t _{PZH} | Output Enable Time to High Level | A OR B DUT | 5 | 20 | ns |
| t _{PLZ} | Output Disable Time from Low Level | | 4 | 15 | ns |
| t _{PHZ} | Output Disable Time from High Level | | 2 | 10 | ns |

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

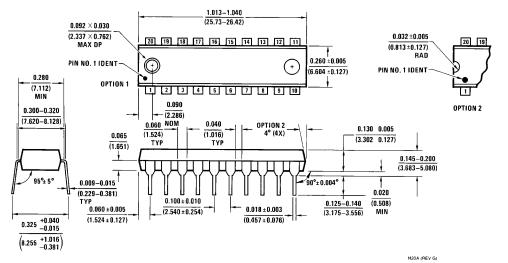
Note 2: Switching characteristic conditions are V_{CC} = 4.5V to 5.5V, R_L = 500 Ω , C_L = 50 pF.





20-Lead (0.150" Wide) Shrink Small Outline Package, JEDEC NS Package Number MQA20

Physical Dimensions inches (millimeters) (Continued)



Molded Dual-In-Line Package (N) Order Number DM74ALS245AN NS Package Number N20A

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