

T-52-31-00



# DM54ALS245A/DM74ALS245A

## Octal TRI-STATE® Bus Transceiver

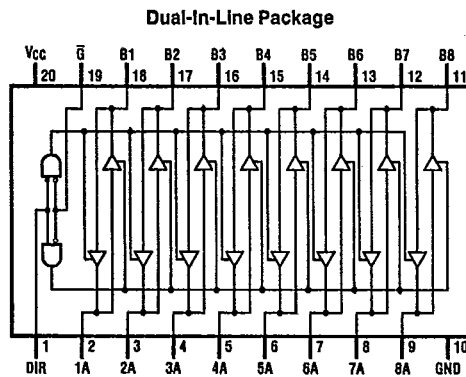
### General Description

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 ( $\bar{G}$ ) 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
- Low output impedance to drive terminated transmission lines to 133Ω
- Switching response specified into 500Ω/50 pF
- Specified to interface with CMOS at  $V_{OH} = V_{CC} - 2V$
- PNP inputs to reduce input loading
- Switching specifications guaranteed over full temperature and  $V_{CC}$  range

### Connection Diagram



TL/F/6213-1

Order Number DM54ALS245AJ, DM74ALS245AWM, DM74ALS245AWN or DM74ALS245ASJ  
See NS Package Number J20A, M20B, M20D 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

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



245A

T-52-31

**Absolute Maximum Ratings**

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

Supply Voltage 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

Typical  $\theta_{JA}$   
 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	DM54ALS245A			DM74ALS245A			Units
		Min	Typ	Max	Min	Typ	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5	5.5	4.5	5	5.5	V
V <sub>IH</sub>	High Level Input Voltage	2			2			V
V <sub>IL</sub>	Low Level Input Voltage			0.7			0.8	V
I <sub>OH</sub>	High Level Output Current			-12			-15	mA
I <sub>OL</sub>	Low Level Output Current			12			24	mA
T <sub>A</sub>	Operating Free Air Temperature	-55		125	0		70	°C

**Electrical Characteristics**

over recommended operating free air temperature range. All typical values are measured at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V <sub>IK</sub>	Input Clamp Voltage	V <sub>CC</sub> = 4.5V, I <sub>IN</sub> = -18 mA			-1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = 4.5V, I <sub>OH</sub> = -3 mA	2.4	3.2		V
		V <sub>CC</sub> = 4.5V, I <sub>OH</sub> = Max	2	2.3		V
		I <sub>OH</sub> = -0.4 mA, V <sub>CC</sub> = 4.5V to 5.5V	V <sub>CC</sub> - 2			V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = 4.5V		0.25	0.4	V
		54/74ALS I <sub>OL</sub> = 12 mA		0.35	0.5	V
I <sub>I</sub>	Input Current at Max Input Voltage	V <sub>CC</sub> = 5.5V			0.1	mA
		V <sub>IN</sub> = 7V Control Inputs V <sub>IN</sub> = 5.5V A or B Ports			0.1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 2.7V			20	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 0.4V			-0.1	mA
I <sub>O</sub>	Output Drive Current	V <sub>CC</sub> = 5.5V, V <sub>OUT</sub> = 2.25V	-30		-112	mA
I <sub>CC</sub>	54ALS245A Supply Current	V <sub>CC</sub> = 5.5V		30	48	mA
		Outputs High		38	60	mA
		TRI-STATE		38	63	mA
I <sub>CC</sub>	74ALS245A Supply Current	V <sub>CC</sub> = 5.5V		30	45	mA
		Outputs High		36	55	mA
		TRI-STATE		38	58	mA

T-52-31

245A

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

Symbol	Parameter	Circuit Configuration	DM54ALS245A		DM74ALS245A		Units
			Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay Time High-to-Low Level Output		1	19	3	10	ns
t <sub>PHL</sub>	Propagation Delay Time High-to-Low Level Output		1	14	3	10	ns
t <sub>PZL</sub>	Output Enable Time to Low Level		2	29	5	20	ns
t <sub>PZH</sub>	Output Enable Time to High Level		2	30	5	20	ns
t <sub>PLZ</sub>	Output Disable Time from Low Level		2	30	4	15	ns
t <sub>PHZ</sub>	Output Disable Time from High Level		2	14	2	10	ns

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

Note 2: Switching characteristic conditions are V<sub>CC</sub> = 4.5V to 5.5V, R<sub>L</sub> = 500Ω, C<sub>L</sub> = 50 pF.

2