



## DM54ALS245A/DM74ALS245A Octal TRI-STATE® Bus Transceivers

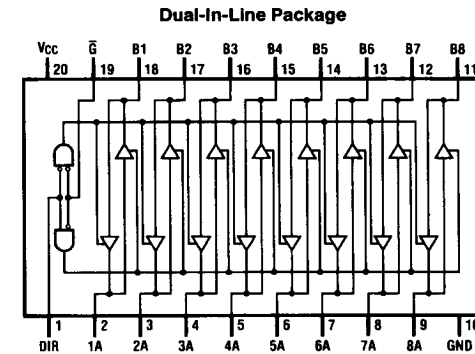
### General Description

This advanced low power Schottky device contains 8 pairs of TRI-STATE logic elements configured as octal bus transceivers. 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  $133\Omega$
- Switching response specified into  $500\Omega/50\text{ pF}$
- 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** or **DM74ALS245AWM, N**  
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

H = High Logic Level

L = Low Logic Level

X = Either High or Low Logic Level

## Absolute Maximum Ratings

If Military/Aerospace specified devices are required, 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

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	54/74ALS I <sub>OL</sub> = 12 mA		0.25	0.4	V
			74ALS I <sub>OL</sub> = 24 mA		0.35	0.5	V
I <sub>I</sub>	Input Current at Max Input Voltage	V <sub>CC</sub> = 5.5V	V <sub>IN</sub> = 7V	Control Inputs		0.1	mA
			V <sub>IN</sub> = 5.5V	A or B Ports		0.1	
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>	54ALS254A Supply Current	V <sub>CC</sub> = 5.5V	Outputs High		30	48	mA
			Outputs Low		38	60	mA
			TRI-STATE		38	63	mA
I <sub>CC</sub>	74ALS254A Supply Current	V <sub>CC</sub> = 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 Configuration	DM54ALS245A		DM74ALS245A		Units
			Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay Time High-to-Low Level Output		1	19	3	10	ns
$t_{PHL}$	Propagation Delay Time High-to-Low Level Output		1	14	3	10	ns
$t_{PZL}$	Output Enable Time to Low Level		2	29	5	20	ns
$t_{PZH}$	Output Enable Time to High Level		2	30	5	20	ns
$t_{PLZ}$	Output Disable Time from Low Level		2	30	4	15	ns
$t_{PHZ}$	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  $V_{CC} = 4.5V$  to  $5.5V$ ,  $R_L = 500\Omega$ ,  $C_L = 50$  pF.