

DM54ALS1623/DM74ALS1623 Octal TRI-STATE® Bus Transceiver

General Description

This advanced low power Schottky device contains 8 pairs of TRI-STATE log elements configured as an octal bus transceiver. It is designed for use in memory, micro-processor systems and in asynchronous bidirectional data buses. Data transmission from the A bus to the B bus or from the B bus to the A bus is selectively controlled by ($\overline{\text{GBA}}$ and GAB) the enable inputs. These inputs are also used to disable the devices so that the buses are effectively isolated.

The dual-enable configuration gives the ALS1623 the capability to store data by simultaneous enabling of $\overline{\text{GBA}}$ and GAB . Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled and all other data sources to the two sets of bus lines are at high impedance, both sets of bus lines will remain at their last logic states.

Features

- Low power version of ALS623
- Advanced oxide-isolated, ion implanted Schottky process

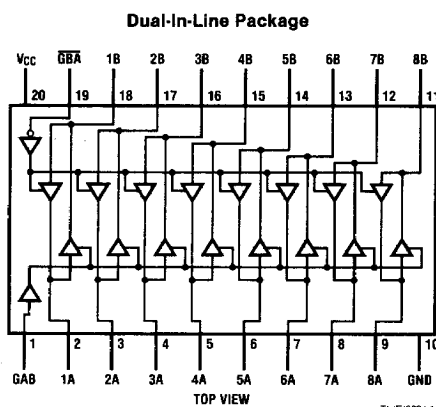
- TRI-STATE outputs on A and B buses
- PNP input design reduces input loading
- Local bus-latch capability
- Switching response specified into 500 Ω /50 pF load
- Switching specifications guaranteed over full temperature and V_{CC} range
- Low output impedance to drive terminated transmission lines to 133 Ω

Absolute Maximum Ratings (Note 1)

Supply Voltage, V_{CC}	7V
Input Voltage	7V
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	+300°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.

Connection Diagram



54ALS1623 (J)

74ALS1623 (J, N)

Function Table

Enable Inputs		Operation
$\overline{\text{GBA}}$	GAB	
L	L	B Data to A Bus
H	H	A Data to B Bus
H	L	Hi-Z
L	H	B Data to A Bus A Data to B Bus

Recommended Operating Conditions

Symbol	Parameter	DM54ALS1623			DM74ALS1623			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			0.8			0.8	V
I_{OH}	High Level Output Current			-12			-15	mA
I_{OL}	Low Level Output Current			8			16	mA
	DM74ALS1623-1						24	mA
T_A	Operating Free Air Temperature	-55		125	0		70	°C

Electrical Characteristics over recommended operating free air temperature range.

All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.

Symbol	Parameter	Conditions	DM54ALS1623			DM74ALS1623			Units
			Min	Typ	Max	Min	Typ	Max	
V_{IK}	Input Clamp Voltage	$V_{CC} = 4.5V$, $I_{IN} = -18\text{ mA}$			-1.5			-1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = 4.5V$, $I_{OH} = -3\text{ mA}$	2.4	3.2		2.4	3.2		V
		$V_{CC} = 4.5V$, $I_{OH} = \text{Max}$	2			2			V
		$I_{OH} = -0.4\text{ mA}$, $V_{CC} = 4.5V\text{ to }5.5V$	$V_{CC} - 2$			$V_{CC} - 2$			V
V_{OL}	Low Level Output Voltage	$V_{CC} = 4.5V$, $I_{OL} = 8\text{ mA}$		0.25	0.4		0.25	0.4	V
		$I_{OL} = 16\text{ mA}$					0.35	0.5	V
		For 74ALS-1 Option Only					0.35	0.5	V
		$I_{OL} = 24\text{ mA}$							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	$V_{CC} = 5.5V$, $V_{IN} = 2.7V$, A or B Ports			20			20	mA
		Control Inputs			20			20	mA
I_{IL}	Low Level Input Current	$V_{CC} = 5.5V$, $V_{IN} = 0.4V$, A or B Ports			-0.1			-0.1	mA
		Control Inputs			-0.1			-0.1	mA
I_O	Output Drive Current	$V_{CC} = 5.5V$, $V_{OUT} = 2.25V$	-30		-112	-30		-112	mA
I_{CC}	Supply Current	$V_{CC} = 5.5V$, Outputs High		11			11		mA
		Outputs Low		18			18		mA
		TRI-STATE		13			13		mA

Switching Characteristics over recommended operating free air temperature range (Note 1).All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.

Symbol	Parameter	Circuit Configuration	DM54ALS1623			DM74ALS1623			Units
			Min	Typ	Max	Min	Typ	Max	
t_{PLH}	Propagation Delay Time, Low to High Level Output			8			8		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output			8			8		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output			8			8		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output			8			8		ns
t_{PZL}	Output Enable Time to Low Level			21			21		ns
t_{PZH}	Output Enable Time to High Level			18			18		ns
t_{PLZ}	Output Disable Time from Low Level			13			13		ns
t_{PHZ}	Output Disable Time from High Level			12			12		ns
t_{PZL}	Output Enable Time to Low Level			21			21		ns
t_{PZH}	Output Enable Time to Low Level			18			18		ns
t_{PLZ}	Output Disable Time from Low Level			13			13		ns
t_{PHZ}	Output Disable Time from High Level			12			12		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.**Note 3:** $I_{OL} = 24$ mA for -1 option.