



**National
Semiconductor**

PRELIMINARY

**DM54ALS1621/DM74ALS1621,
DM54ALS1622/DM74ALS1622**

Octal Open Collector Output Bus Transceivers

General Description

These advanced low power Schottky devices contain 8 pairs of log elements configured as octal bus transceivers. They are 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 (\bar{G} BA 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 ALS1621 and ALS1622 the capability to store data by simultaneous enabling of \bar{G} BA 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.

Pull-Up Resistor Equations

$$R_{MAX} = \frac{V_{CC} (Min) - V_{OH}}{N_1 (I_{OH}) + N_2 (I_{IH})}$$

$$R_{MIN} = \frac{V_{CC} (Max) - V_{OL}}{I_{OL} - N_3 (I_{IL})}$$

Where: $N_1 (I_{OH})$ = total maximum output high current for all outputs tied to pull-up resistor
 $N_2 (I_{IH})$ = total maximum input high current for all inputs tied to pull-up resistor
 $N_3 (I_{IL})$ = total maximum input low current for all inputs tied to pull-up resistor

Features

- Low power versions of 'ALS621, 622
- Advanced oxide-isolated, ion implanted Schottky process
- Choice of true or inverting logic
- Open collector outputs on A and B buses
- PNP input design reduces input loading
- Local bus-latch capability
- Switching response specified into 500Ω/50 pF
- Switching specification guaranteed over full temperature and V_{CC} range
- Low output impedance to drive terminated transmission lines to 133Ω

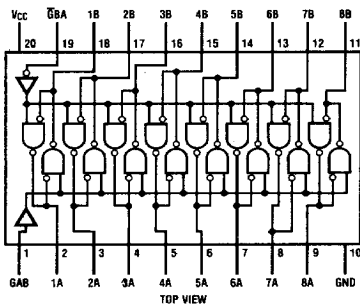
Absolute Maximum Ratings (Note 1)

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 Diagrams

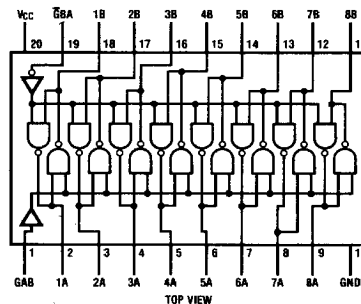
Dual-In-Line Packages



TL/F/6265-1

54ALS1621 (J)

74ALS1621 (J, N)



TL/F/6265-2

54ALS1622 (J)

74ALS1622 (J, N)

This document contains information on a product under development. NSC reserves the right to change or discontinue this product without notice.

Recommended Operating Conditions

Symbol	Parameter	DM54ALS1621 DM74ALS1622			DM74ALS1621 DM74ALS1622			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
V _{OH}	High Level Output Voltage			5.5			5.5	V
I _{OL}	Low Level Output Current			8			16	mA
	DM74ALS1621-1 and DM74ALS1622-1 Options Only						24	mA
T _A	Operating Free Air Temperature Range	-55		125	0		70	°C

Electrical Characteristics

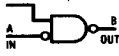
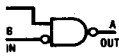
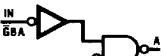
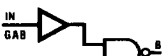




over recommended operating free air temperature range.

All typical values are measured at V_{CC} = 5V, T_A = 25°C.

Symbol	Parameter	Conditions	DM54ALS1621 DM54ALS1622			DM74ALS1621 DM74ALS1622			Units	
			Min	Typ	Max	Min	Typ	Max		
V _{IK}	Input Clamp Voltage	V _{CC} = 4.5V, I _{IN} = -18 mA			-1.5			-1.5	V	
I _{OH}	High Level Output	V _{CC} = 4.5V, V _{OH} = 5.5V			0.1			0.1	mA	
V _{OL}	Low Level Output Voltage	V _{CC} = 4.5V	I _{OL} = 8 mA		0.25	0.4		0.25	0.4	V
			I _{OL} = 16 mA					0.35	0.5	
			For 74ALS-1 Option Only I _{OL} = 24 mA					0.35	0.5	
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			20			20	μA	
I _{IL}	Low Level Input Current	V _{CC} = 5.5V, V _{IN} = 0.4V			-0.1			-0.1	mA	
I _{CC}	DM54/74ALS1621 Supply Current	V _{CC} = 5.5V	Outputs High		11			11	mA	
			Outputs Low		16			16		
I _{CC}	DM54/74ALS1622 Supply Current	V _{CC} = 5.5V	Outputs High		13			13	mA	
			Outputs Low		18			18		

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

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

Symbol	Parameter	Circuit Configuration	DM54ALS1621 DM54ALS1622			DM74ALS1621 DM74ALS1622			Units
			Min	Typ	Max	Min	Typ	Max	
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1621		22			22		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1621		14			14		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1621		22			22		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1621		14			14		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1621		33			33		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1621		24			24		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1621		33			33		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1621		24			24		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1622		25			25		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1622		13			13		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1622		25			25		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1622		13			13		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1622		31			31		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1622		28			28		ns
t_{PLH}	Propagation Delay Time, Low to High Level Output	 ALS1622		31			31		ns
t_{PHL}	Propagation Delay Time, High to Low Level Output	ALS1622		28			28		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.

Function Table

Enable Inputs		Operation	
GBA	GAB	ALS1622	ALS1621
L	L	\bar{B} Data to A Bus	B Data to A Bus
H	H	\bar{A} Data to B Bus	A Data to B Bus
H	L	Hi	Hi
L	H	\bar{B} Data to A Bus \bar{A} Data to B Bus	B Data to A Bus A Data to B Bus