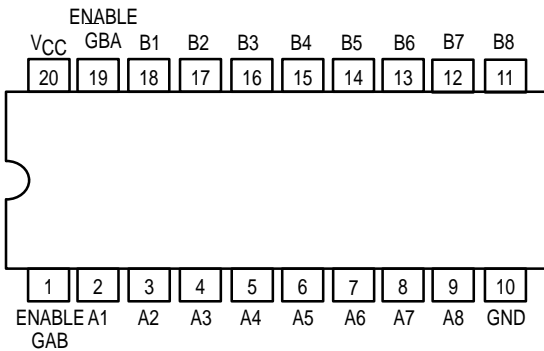




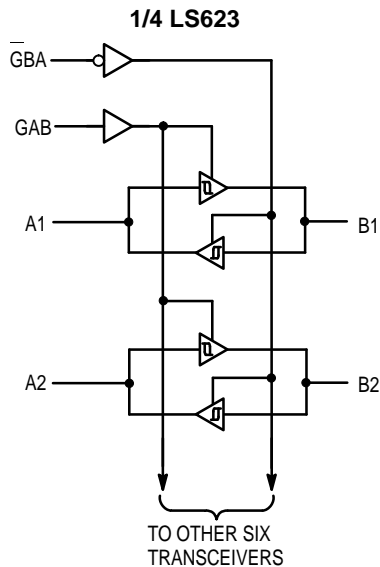
# OCTAL BUS TRANSCEIVER WITH 3-STATE OUTPUT

The SN54/74LS623 series is an octal bus transceiver designed for asynchronous two-way communication between data buses. Control function implementation allows maximum timing flexibility. Enable inputs may be used to disable the device so that buses are effectively isolated. Depending on the Logic Levels at the enable inputs, Data transmission is allowed from the A bus to the B bus or from the B bus to the A bus. The dual-enable configuration gives the LS623 the capability to store data by simultaneous enabling of GBA and GAB. Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled all other data sources to the two sets of bus lines (16 in all) will remain at their last states.

## CONNECTION DIAGRAM (TOP VIEW)

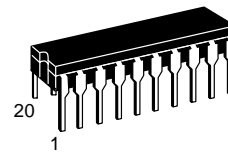


## BLOCK DIAGRAM

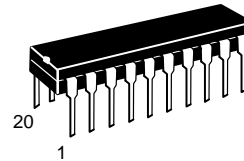


## SN54/74LS623

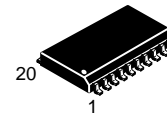
### OCTAL BUS TRANSCEIVER WITH 3-STATE OUTPUT LOW POWER SCHOTTKY



**J SUFFIX**  
CERAMIC  
CASE 732-03



**N SUFFIX**  
PLASTIC  
CASE 738-03



**DW SUFFIX**  
SOIC  
CASE 751D-03

## ORDERING INFORMATION

SN54LSXXXJ Ceramic  
SN74LSXXXN Plastic  
SN74LSXXXDW SOIC

## FUNCTION TABLE

| ENABLE INPUTS |     | OPERATION                           |
|---------------|-----|-------------------------------------|
| GBA           | GAB | LS623                               |
| L             | L   | B data to A bus                     |
| H             | H   | A data to B bus                     |
| H             | L   | Isolation                           |
| L             | H   | B data to A bus,<br>A data to B bus |

H = HIGH Level, L = LOW Level, X = Irrelevant

# SN54/74LS623

## GUARANTEED OPERATING RANGES

| Symbol          | Parameter                           |          | Min         | Typ        | Max         | Unit |
|-----------------|-------------------------------------|----------|-------------|------------|-------------|------|
| V <sub>CC</sub> | Supply Voltage                      | 54<br>74 | 4.5<br>4.75 | 5.0<br>5.0 | 5.5<br>5.25 | V    |
| T <sub>A</sub>  | Operating Ambient Temperature Range | 54<br>74 | -55<br>0    | 25<br>25   | 125<br>70   | °C   |
| I <sub>OH</sub> | Output Current — High               | 54, 74   |             |            | -3.0        | mA   |
|                 |                                     | 54<br>74 |             |            | -12<br>-15  | mA   |
| I <sub>OL</sub> | Output Current — Low                | 54       |             |            | 12          | mA   |
|                 |                                     | 74       |             |            | 24          | mA   |

## DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

| Symbol                           | Parameter                      |                     | Limits |       |      | Unit | Test Conditions   |
|----------------------------------|--------------------------------|---------------------|--------|-------|------|------|---|
|                                  |                                |                     | Min    | Typ   | Max  |      |   |
| V <sub>IH</sub>                  | Input HIGH Voltage             |                     | 2.0    |       |      | V    | Guaranteed Input HIGH Voltage for All Inputs  |
| V <sub>IL</sub>                  | Input LOW Voltage              | 54                  |        |       | 0.5  | V    | Guaranteed Input LOW Voltage for All Inputs   |
|                                  |                                | 74                  |        |       | 0.6  |      |   |
| V <sub>T+</sub> -V <sub>T-</sub> | Hysteresis                     |                     | 0.2    | 0.4   |      | V    | V <sub>CC</sub> = MIN   |
| V <sub>IK</sub>                  | Input Clamp Diode Voltage      |                     |        | -0.65 | -1.5 | V    | V <sub>CC</sub> = MIN, I <sub>IN</sub> = -18 mA   |
| V <sub>OH</sub>                  | Output HIGH Voltage            | 54, 74              | 2.4    | 3.4   |      | V    | V <sub>CC</sub> = MIN, I <sub>OH</sub> = ± 3.0 mA   |
|                                  |                                | 54, 74              | 2.0    |       |      | V    | V <sub>CC</sub> = MIN, I <sub>OH</sub> = MAX  |
| V <sub>OL</sub>                  | Output LOW Voltage             | 54, 74              |        | 0.25  | 0.4  | V    | I <sub>OL</sub> = 12 mA   |
|                                  |                                | 74                  |        | 0.35  | 0.5  | V    | I <sub>OL</sub> = 24 mA   |
|                                  |                                |                     |        |       |      |      | V <sub>CC</sub> = V <sub>CC</sub> MIN,<br>V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>per Truth Table |
| I <sub>OZH</sub>                 | Output Off Current HIGH        |                     |        |       | 20   | μA   | V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 2.7 V   |
| I <sub>OZL</sub>                 | Output Off Current LOW         |                     |        |       | -400 | μA   | V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 4.0 V   |
| I <sub>IH</sub>                  | Input HIGH Current             | A, or B, GBA or GAB |        |       | 20   | μA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2.7 V  |
|                                  |                                | GAB or GAB          |        |       | 0.1  | mA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 7.0 V  |
|                                  |                                | A or B              |        |       | 0.1  | mA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 5.5 V  |
| I <sub>IL</sub>                  | Input LOW Current              |                     |        |       | -0.4 | mA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.4 V  |
| I <sub>OS</sub>                  | Short Circuit Current (Note 1) |                     | -40    |       | -225 | mA   | V <sub>CC</sub> = MAX   |
| I <sub>CC</sub>                  | Power Supply Current           |                     |        |       |      | mA   | V <sub>CC</sub> = MAX   |
|                                  | Total Output HIGH              |                     |        |       | 70   |      |   |
|                                  | Total Output LOW               |                     |        |       | 90   |      |   |
|                                  | Total at HIGH Z                |                     |        |       | 95   |      |   |

Note 1: Not more than one output should be shorted at a time, nor for more than 1 second.

# SN54/74LS623

## AC CHARACTERISTICS (T<sub>A</sub> = 25°C, V<sub>CC</sub> = 5.0 V)

| Symbol                               | Parameter                       | Limits |           |          | Unit | Test Conditions                                   |
|--------------------------------------|---------------------------------|--------|-----------|----------|------|---|
|                                      |                                 | Min    | Typ       | Max      |      |   |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | Propagation Delay<br>A to B     |        | 8.0<br>11 | 15<br>15 | ns   | C <sub>L</sub> = 45 pF,<br>R <sub>L</sub> = 667 Ω |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | Propagation Delay<br>B to A     |        | 8.0<br>11 | 15<br>15 | ns   |   |
| t <sub>PZL</sub><br>t <sub>PZH</sub> | Output Enable Time<br>GBA to A  |        | 31<br>26  | 40<br>40 | ns   |   |
| t <sub>PZL</sub><br>t <sub>PZH</sub> | Output Enable Time<br>GAB to B  |        | 31<br>26  | 40<br>40 | ns   |   |
| t <sub>PLZ</sub><br>t <sub>PHZ</sub> | Output Disable Time<br>GBA to A |        | 15<br>15  | 25<br>25 | ns   | C <sub>L</sub> = 5.0 pF                           |
| t <sub>PLZ</sub><br>t <sub>PHZ</sub> | Output Disable Time<br>GAB to B |        | 15<br>15  | 25<br>25 | ns   |   |