

# DM54ALS679/DM74ALS679, DM54ALS680/DM74ALS680

## Address Comparators

### General Description

The 'ALS679 and 'ALS680 address comparators simplify addressing of memory boards and/or other peripheral devices. The four P inputs are normally hard wired with a preprogrammed address. An internal decoder determines what input information applied to the 12 A inputs must be low or high to cause a low state at the output (Y). For example, a positive-logic bit combination of 0111 (decimal 7) at the P input determines that inputs A1 through A7 must be low and that inputs A8 through A12 must be high to cause the output to go low. Equality of the address applied at the A inputs to the preprogrammed address is indicated by the output being low.

The 'ALS679 features an enable input ( $\bar{G}$ ). When  $\bar{G}$  is low, the device is enabled. When  $\bar{G}$  is high, the device is disabled and the output is high, regardless of the A and P inputs. The 'ALS680 features a transparent latch and a latch enable input (C). When C is high, the device is in the transparent mode. When C is low, the previous logical state of Y is latched.

### Features

- 'ALS679 is a 12-bit to 4-bit comparator with enable
- 'ALS680 is a 12-bit to 4-bit comparator with latch
- Switching specifications at 50 pF
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Switching specifications guaranteed over full temperature and  $V_{CC}$  range

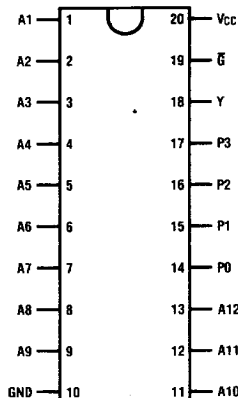
### Absolute Maximum Ratings (Note 1)

|                           |                   |
|---------------------------|-------------------|
| Supply Voltage            | 7V                |
| Input Voltage             | 7V                |
| Storage Temperature Range | - 65°C to + 150°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

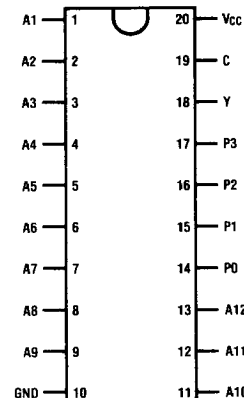


TOP VIEW

TL/F/6237-1

DM54ALS679 (J)

DM74ALS679 (J, N)



TOP VIEW

TL/F/6237-2

DM54ALS680 (J)

DM74ALS680 (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                            | DM54ALS679, 680 |     |     | DM74ALS679, 680 |     |      | 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              |                 |     | 0.8 |                 |     | 0.8  | V     |
| I <sub>OH</sub> | High Level Output Current            |                 |     | -1  |                 |     | -2.6 | mA    |
| I <sub>OL</sub> | Low Level Output Current             |                 |     | 12  |                 |     | 24   | mA    |
| T <sub>A</sub>  | 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<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

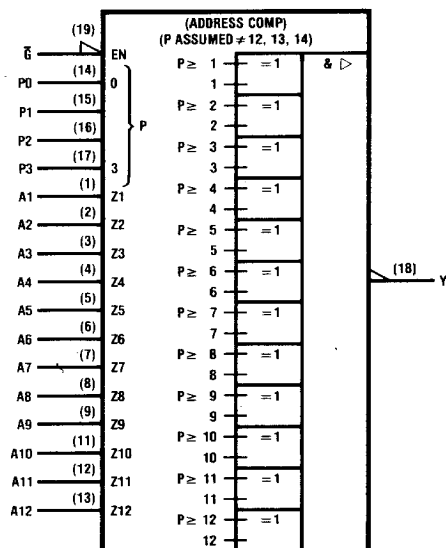
| Symbol          | Parameter                          | Conditions                                                    |                                 | Min                 | Typ  | Max  | Unit    |
|-----------------|------------------------------------|---------------------------------------------------------------|---------------------------------|---------------------|------|------|---------|
| V <sub>IK</sub> | Input Clamp Voltage                | V <sub>CC</sub> = 4.5V, I <sub>IN</sub> = -18mA               |                                 |                     |      | -1.5 | V       |
| V <sub>OH</sub> | High Level Output Voltage          | V <sub>CC</sub> = 4.5V, I <sub>OH</sub> = Max                 |                                 | 2.4                 | 3.2  |      | V       |
|                 |                                    | I <sub>OH</sub> = -400 $\mu$ A, V <sub>CC</sub> = 4.5 to 5.5V |                                 | V <sub>CC</sub> - 2 |      |      | V       |
| V <sub>OL</sub> | Low Level Output Voltage           | V <sub>CC</sub> = 4.5V                                        | 54ALS<br>I <sub>OL</sub> = 12mA |                     | 0.25 | 0.4  | V       |
|                 |                                    |                                                               | 74ALS<br>I <sub>OL</sub> = 24mA |                     | 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                  |                                 |                     |      | 0.1  | mA      |
| I <sub>IH</sub> | High Level Input Current           | V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 2.7V                |                                 |                     |      | 20   | $\mu$ A |
| 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> | Supply Current                     | V <sub>CC</sub> = 5.5V                                        | ALS679                          |                     | 12.6 | 28   | mA      |
|                 |                                    |                                                               | ALS680                          |                     | 13.4 |      |         |

## Function Table

| 'ALS679<br>G     | 'ALS680<br>C     | Inputs Common to 'ALS679 and 'ALS680 |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | Output<br>Y |
|------------------|------------------|--------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------|
|                  |                  | P3                                   | P2               | P1               | P0               | A1               | A2               | A3               | A4               | A5               | A6               | A7               | A8               | A9               | A10              | A11              | A12              |             |
| L<br>L<br>L<br>L | H<br>H<br>H<br>H | L<br>L<br>L<br>L                     | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>H<br>L<br>H | H<br>L<br>L<br>L | H<br>H<br>H<br>L | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | L<br>L<br>L<br>L |             |
| L<br>L<br>L<br>L | H<br>H<br>H<br>H | L<br>L<br>L<br>L                     | H<br>H<br>H<br>H | L<br>L<br>H<br>H | L<br>L<br>L<br>H | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | H<br>L<br>L<br>L | H<br>H<br>L<br>L | H<br>H<br>H<br>L | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | H<br>H<br>H<br>H | L<br>L<br>L<br>L |             |
| L<br>L<br>L<br>L | H<br>H<br>H<br>H | H<br>H<br>H<br>H                     | L<br>L<br>L<br>L | L<br>L<br>L<br>L | H<br>H<br>H<br>H | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | H<br>L<br>L<br>L | H<br>H<br>L<br>L | H<br>H<br>L<br>L | H<br>H<br>L<br>L | L<br>L<br>L<br>L |             |
| L<br>L<br>L<br>L | H<br>H<br>H<br>H | H<br>H<br>H<br>H                     | H<br>L<br>L<br>L | L<br>L<br>L<br>L | H<br>H<br>H<br>H | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | L<br>L<br>L<br>L | H<br>L<br>L<br>L | H<br>H<br>L<br>L | H<br>H<br>L<br>L | L*<br>L*<br>L*   |             |
| L                | H                | H                                    | H                | H                | H                | L                | L                | L                | L                | L                | L                | L                | L                | L                | L                | L                | L                |             |
| L                | H                | All Other Combinations               |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | H           |
| H                |                  | 'ALS679: Any Combination             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | H           |
|                  | L                | 'ALS680: Any Combination             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | Latched     |

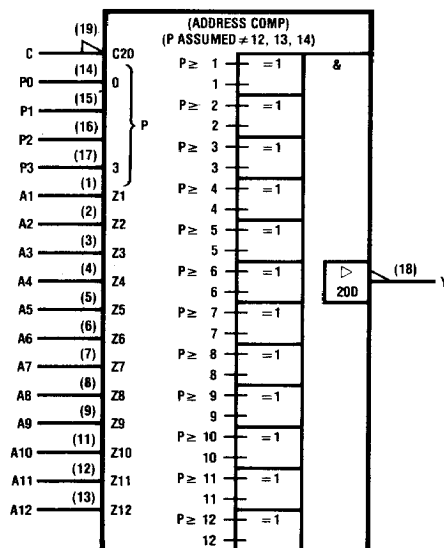
## Logic Symbols

'ALS679



TL/F/6237-3

**'ALS680**



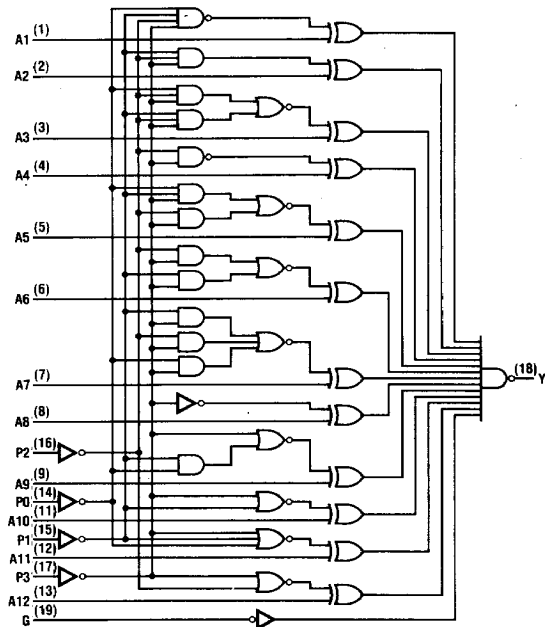
TL/F/6237-4

\* The three shaded rows of the function table show combinations that would normally not be used in address comparator applications. The logic symbols above are not valid for these combinations in which  $P = 12, 13$ , and  $14$ . If symbols valid for all combinations are required, starting with the fourth Exclusive-OR from the bottom, change  $P \geq 9$  to  $P = 9, 11/13, \dots, 15$ ,  $P \geq 10$  to  $P = 10/11/14/15$ , and  $P \geq 11$  to  $P = 11/15$ .

Pin numbers shown are for J and N packages.

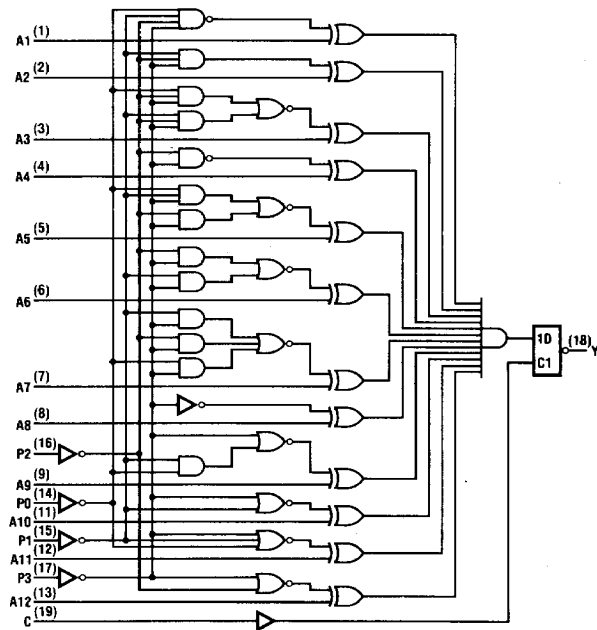
# Logic Diagrams (Positive Logic)

'ALS679



TL/F/6237-5

'ALS680



TL/F/6237-6

Pin numbers shown are for J and N packages.

