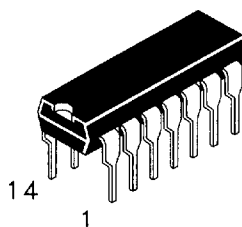


## Quad 2-Input Exclusive OR Gates

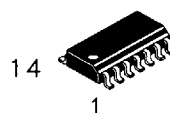
This device contains four independent gates, each of which performs the logic exclusive-OR function.

- AVG's LS operates over extended  $V_{CC}$  from 4.5 to 5.5 V
- AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and  $V_{CC}$  range
- Switching specifications for ALS at 50 pF
- AVG's ALS has the lowest speed power product (4pJ per gate typical) of all logic series

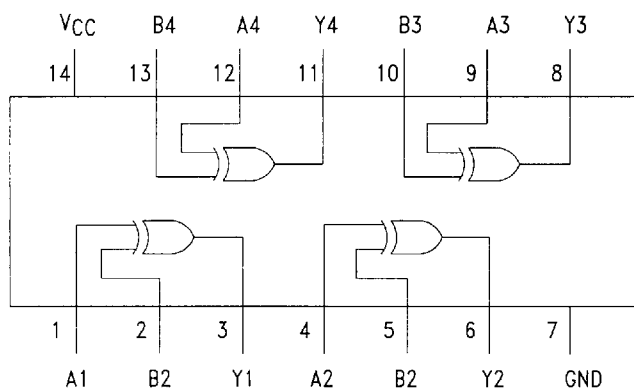
### DV74LS86 DV74ALS86



N Suffix  
Plastic DIP  
AVG-001 Case



D Suffix  
Plastic SOP  
AVG-002 Case



TRUTH TABLE

| Inputs |   | Output |
|--------|---|--------|
| A      | B | Y      |
| L      | L | L      |
| L      | H | H      |
| H      | L | H      |
| H      | H | L      |

H= High Logic Level  
L = Low Logic Level

### ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

| Symbol    | Parameter                 | LS86        | ALS86        | Unit |
|-----------|---------------------------|-------------|--------------|------|
| $V_{CC}$  | Supply Voltage            | 7.0         | 7.0          | V    |
| $V_{IN}$  | Input Voltage             | 7.0         | 7.0          | V    |
| $T_{STG}$ | Storage Temperature Range | -65 to +150 | -65 to + 150 | °C   |

### GUARANTEED OPERATING CONDITIONS

| Symbol   | Parameter                 | LS86       |      | ALS86       |      | Unit |
|----------|---------------------------|------------|------|-------------|------|------|
|          |                           | Min        | Max  | Min         | Max  |      |
| $V_{CC}$ | Supply Voltage            | 4.5        | 5.5  | 4.5         | 5.5  | V    |
| $V_{IH}$ | High Level Input Voltage  | 2.0        |      | 2.0         |      | V    |
| $V_{IL}$ | Low Level Input Voltage   |            | 0.8  |             | 0.8  | V    |
| $I_{OH}$ | High Level Output Current |            | -0.4 |             | -0.4 | mA   |
| $I_{OL}$ | Low Level Output Current  |            | 8.0  |             | 8.0  | mA   |
| $T_A$    | Ambient Temperature Range | -10 to +70 |      | -10 to + 70 |      | °C   |

**DC ELECTRICAL CHARACTERISTICS** over full operating conditions

| Symbol   | Parameter                 | Conditions                                                                       | LS86       |              |            | ALS86      |              |            | Unit                |
|----------|---------------------------|----------------------------------------------------------------------------------|------------|--------------|------------|------------|--------------|------------|---------------------|
|          |                           |                                                                                  | Min        | Typ          | Max        | Min        | Typ          | Max        |                     |
| $V_{IK}$ | Input Clamp Voltage       | $V_{CC} = \min, I_{IN} = -18 \text{ mA}$                                         |            |              | -1.5       |            |              | -1.5       | V                   |
| $V_{OH}$ | High Level Output Voltage | $V_{CC} = \min, I_{OH} = \max$                                                   | $V_{CC}-2$ | 3.5          |            | $V_{CC}-2$ |              |            | V                   |
| $V_{OL}$ | Low Level Output Voltage  | $V_{CC} = \min; I_{OL} = 4 \text{ mA}$<br>$V_{CC} = \min; I_{OL} = 8 \text{ mA}$ |            | 0.25<br>0.35 | 0.4<br>0.5 |            | 0.25<br>0.35 | 0.4<br>0.5 | V                   |
| $I_{IH}$ | High Level Input Current  | $V_{CC} = \max, V_{IN} = 2.7 \text{ V}$<br>$V_{CC} = \max, V_{IN} = 7 \text{ V}$ |            |              | 20<br>0.1  |            |              | 20<br>0.1  | $\mu\text{A}$<br>mA |
| $I_{IL}$ | Low Level Input Current   | $V_{CC} = \max, V_{IN} = 0.4 \text{ V}$                                          |            |              | -0.4       |            |              | -0.1       | mA                  |
| $I_O$    | Short Circuit Current     | $V_{CC} = \max, V_O = 2.25 \text{ V}$                                            | -20        |              | -110       | -30        |              | -112       | mA                  |
| $I_{CC}$ | Supply Current            | $V_{CC} = \max$                                                                  |            |              | 10         |            | 3.9          | 5.9        | mA                  |

**SWITCHING CHARACTERISTICS** over full operating conditions

| Symbol    | Parameter                           | LS86<br>$C_L = 15 \text{ pF}$ |     | ALS86<br>$C_L = 50 \text{ pF}$<br>$R_L = 500 \Omega$ |     | Unit |
|-----------|-------------------------------------|-------------------------------|-----|------------------------------------------------------|-----|------|
|           |                                     | Min                           | Max | Min                                                  | Max |      |
| $t_{PLH}$ | Propagation Delay, Other Input LOW  |                               | 23  | 3                                                    | 17  | ns   |
| $t_{PHL}$ | Propagation Delay, Other Input LOW  |                               | 17  | 2                                                    | 12  | ns   |
| $t_{PLH}$ | Propagation Delay, Other Input HIGH |                               | 30  | 3                                                    | 17  | ns   |
| $t_{PHL}$ | Propagation Delay, Other Input HIGH |                               | 22  | 2                                                    | 10  | ns   |

**SWITCHING WAVEFORMS**