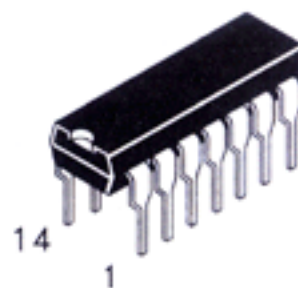


## Hex Inverter with Open Collector Outputs

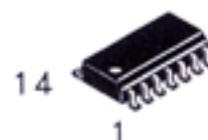
This device contains six independent gates, each of which performs the logic INVERT function. The open-collector outputs require external pull-up resistors for proper logical operation. They may be connected to other open-collector outputs to implement active-low wired-OR or active-high wired-AND functions.

- AVG's LS operates over extended Vcc from 4.5 to 5.5 V
- AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and Vcc 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

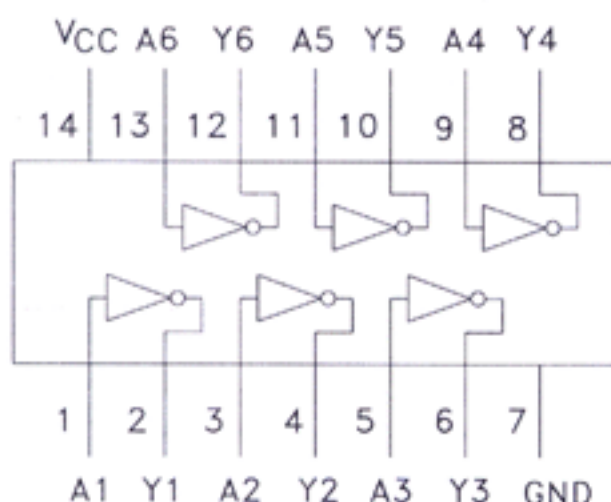
### DV74LS05 DV74ALS05A



N Suffix  
Plastic DIP  
AVG-001 Case



D Suffix  
Plastic SOP  
AVG-002 Case



TRUTH TABLE  
 $Y = \overline{A}$

| Inputs | Outputs |
|--------|---------|
| A      | Y       |
| L      | 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                 | LS05        | ALS05A      | Unit |
|------------------|---------------------------|-------------|-------------|------|
| V <sub>CC</sub>  | Supply Voltage            | 7.0         | 7.0         | V    |
| V <sub>IN</sub>  | Input Voltage             | 7.0         | 7.0         | V    |
| T <sub>STG</sub> | Storage Temperature Range | -65 to +150 | -65 to +150 | °C   |

### GUARANTEED OPERATING CONDITIONS

| Symbol          | Parameter                 | LS05 |     | ALS05A |     | Unit |
|-----------------|---------------------------|------|-----|--------|-----|------|
|                 |                           | Min  | Max | Min    | Max |      |
| V <sub>CC</sub> | Supply Voltage            | 4.5  | 5.5 | 4.5    | 5.5 | V    |
| V <sub>OH</sub> | High Level Output Voltage |      | 5.5 |        | 5.5 | V    |
| V <sub>IH</sub> | High Level Input Voltage  | 2.0  |     | 2.0    |     | V    |
| V <sub>IL</sub> | Low Level Input Voltage   |      | 0.8 |        | 0.8 | V    |
| I <sub>OL</sub> | Low Level Output Current  |      | 8.0 |        | 8.0 | mA   |

**DC ELECTRICAL CHARACTERISTICS** over full operating conditions

| Symbol   | Parameter                                     | Conditions                               | LS05 |      |      | ALS05A |      |      | 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             |
| $I_{OH}$ | High Level Output Current                     | $V_{CC} = \min; V_{OH} = \max$           |      | 100  |      |        |      | 100  | $\mu\text{A}$ |
| $V_{OL}$ | Low Level Output Voltage                      | $V_{CC} = \min;$                         |      |      |      |        |      |      |               |
|          |                                               | $V_{CC} = \min; I_{OL} = 4 \text{ mA}$   |      | 0.25 | 0.4  |        | 0.25 | 0.4  | V             |
|          |                                               | $V_{CC} = \min; I_{OL} = 8 \text{ mA}$   |      | 0.35 | 0.5  |        | 0.35 | 0.5  | V             |
| $I_{IH}$ | High Level Input Current                      | $V_{CC} = \max, V_{IN} = 2.7 \text{ V}$  |      |      | 20   |        |      | 20   | $\mu\text{A}$ |
|          |                                               | $V_{CC} = \max, V_{IN} = 7 \text{ V}$    |      |      | 0.1  |        |      | 0.1  | mA            |
| $I_{IL}$ | Low Level Input Current                       | $V_{CC} = \max, V_{IN} = 0.4 \text{ V}$  |      |      | -0.4 |        |      | -0.1 | mA            |
| $I_{CC}$ | Supply Current<br>Outputs High<br>Outputs Low | $V_{CC} = \max$                          |      |      | 2.4  |        | 0.65 | 1.1  | mA            |
|          |                                               |                                          |      |      | 6.6  |        | 2.9  | 4.2  |               |

**SWITCHING CHARACTERISTICS** over full operating conditions

| Symbol    | Parameter                                           | From  | To     | LS05<br>CL=15 pF<br>RL = 2k $\Omega$ |     | ALS05A<br>CL=50pF<br>RL = 2kW |     | Unit |
|-----------|-----------------------------------------------------|-------|--------|--------------------------------------|-----|-------------------------------|-----|------|
|           |                                                     |       |        | Min                                  | Max | Min                           | Max |      |
| $t_{PLH}$ | Propagation Delay Time,<br>Low to High Level Output | Input | Output |                                      | 32  | 23                            | 54  | ns   |
| $t_{PHL}$ | Propagation Delay Time,<br>High to Low Level Output | Input | Output |                                      | 28  | 4                             | 14  | ns   |

**SWITCHING WAVEFORMS**