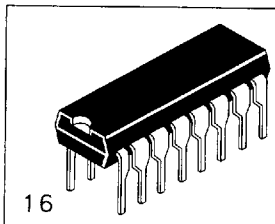
# DV74LS158
# DV74ALS158

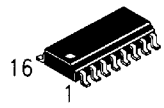
## Quad 1 of 2 Line Data Selector/Multiplexer

This high speed Quad two-input Multiplexer selects four bits of data from two sources using the common Select and Enable inputs. The four buffered outputs present the selected input in the inverted form.

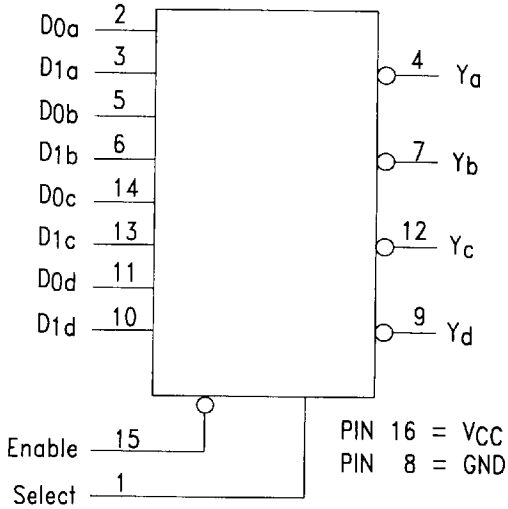
- **AVG's LS operates over extended Vcc from 4.5 to 5.5 V**
- **AVG's LS and ALS both have guaranteed DC and AC specification over full temperature and Vcc range**
- **Switching specifications for ALS at 50 pF**
- **AVG's ALS has the lowest speed power product (4pJ per gate typical) of all logic series**



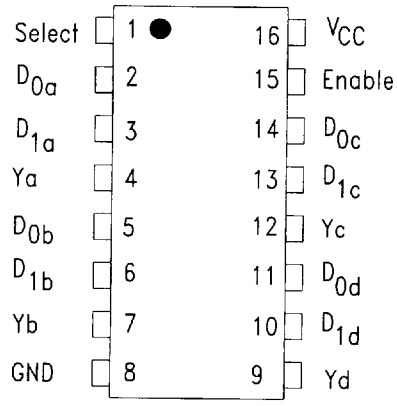

N Suffix
Plastic DIP
AVG-003 Case




D Suffix
Plastic SOP
AVG-004 Case




PIN ASSIGNMENT




**TRUTH TABLE**

| Inputs | | | | Output |
|---|---|---|---|---|
| Data | | Select | Enable | |
| $D_0$ | $D_1$ | S | $\overline{E}$ | $\overline{Y}$ |
| X | X | X | H | H |
| L | X | L | L | H |
| H | X | L | L | L |
| X | L | H | L | H |
| X | H | H | L | L |

H = High Logic Level
L = Low Logic Level
X = Don't Care

### ABSOLUTE MAXIMUM RATINGS

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

| Symbol | Parameter | LS158 | ALS158 | Unit |
|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | 7.0 | 7.0 | V |
| $V_{IN}$ | Input Voltage | –0.5 to +7.0 | 7.0 | V |
| $T_{STG}$ | Storage Temperature Range | –65 to +150 | –65 to +150 | °C |

### GUARANTEED OPERATING CONDITIONS

| Symbol | Parameter | LS158 | | ALS158 | | 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 | LS158 | | | ALS158 | | | Units |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Typ | Max | |
| $V_{IK}$ | Input Clamp Voltage | $V_{CC}$ = min, $I_{IN}$ = −18 mA | | | −1.5 | | | −1.2 | V |
| $V_{OH}$ | High Level Output Voltage | $V_{CC}$=min, $I_{OH}$= max | Vcc-2 | 3.5 | | Vcc-2 | | | V |
| $V_{OL}$ | Low Level Output Voltage | $V_{CC}$=min; $I_{OL}$ =4.0mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | | $V_{CC}$=min; $I_{OL}$ =8.0 mA | | 0.35 | 0.5 | | 0.35 | 0.5 | V |
| $I_{IH}$ | High Level Input Current | $V_{CC}$=max, $V_{IN}$=2.7V, $\frac{Data}{E, S}$ | | | 20<br>40 | | | 20 | µA |
| | | $V_{CC}$=max, $V_{IN}$= 7V, $\frac{Data}{E, S}$ | | | 0.1<br>0.2 | | | 0.1<br>0.2 | mA |
| $I_{IL}$ | Low Level Input Current | $V_{CC}$=max, $V_{IN}$=0.4V, $\frac{Data}{E, S}$ | | | −0.4<br>−0.8 | | | −0.1<br>−0.2 | mA |
| $I_{OS}$ | Short Circuit Current | $V_{CC}$=max, $V_O$=2.25 V | −20 | | −110 | −30 | | −112 | mA |
| $I_{CC}$ | Supply Current | $V_{CC}$=max | | | 8.0 | | 5 | 10 | mA |

**SWITCHING CHARACTERISTICS**

| Symbol | Parameter | LS158 $C_L$=15pF | | ALS158 $C_L$= 50 pF $R_L$= 500Ω | | Unit |
|---|---|---|---|---|---|---|
| | | Min | Max | Min | Max | |
| $t_{PLH}$ | Propagation Delay From Select to Output Y | | 20 | 5 | 18 | ns |
| $t_{PHL}$ | | | 24 | 5 | 18 | |
| $t_{PLH}$ | Propagation Delay From Data to Output Y | | 12 | 4 | 8 | ns |
| $t_{PHL}$ | | | 15 | 2 | 8 | |
| $t_{PLH}$ | Propagation Delay From Enable to Output Y | | 17 | 5 | 18 | ns |
| $t_{PHL}$ | | | 24 | 5 | 18 | |

**SWITCHING WAVEFORMS**