

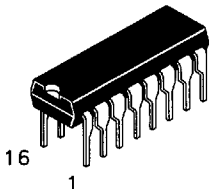
Available Q3, 1995

Quad 2-Input Multiplexor with 3-State Outputs

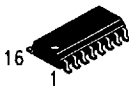
In these device, four bits of data from 2 sources can be selected using a Common Data Selection Input. The 4 outputs present the selected data in true(non-inverted) form in the 'AC/ACT 257 and in complimentary form (inverted) in the 'AC/ACT 258. The outputs may be switched to a high impedance state with a HIGH on the common Output Enable Input, allowing the outputs to interface directly with bus oriented systems.

- Advanced very high speed CMOS
- Outputs source/sink 24 mA
- Transmission line driving 50 ohms
- ACT has TTL compatible inputs
- Operation from 2 to 6 volts guaranteed
- DC & AC Parameters guaranteed over -40 to +85°C

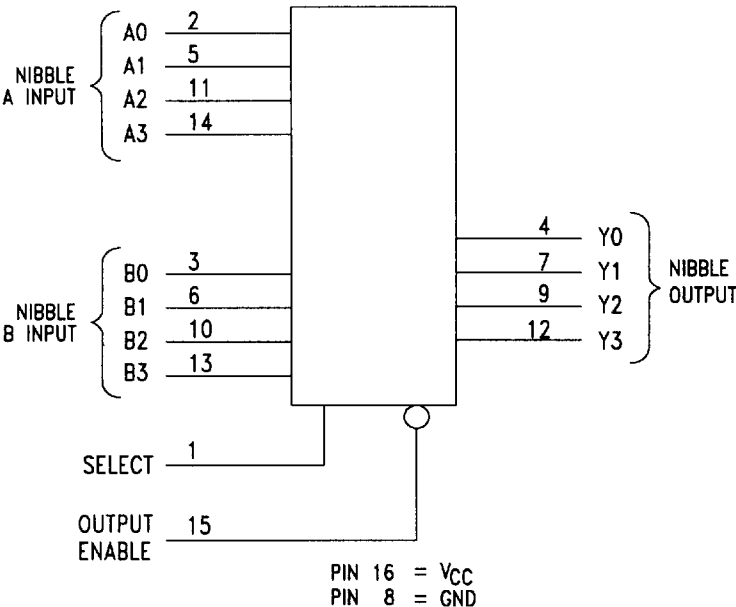
DV74AC257  
DV74ACT257  
DV74AC258  
DV74ACT258



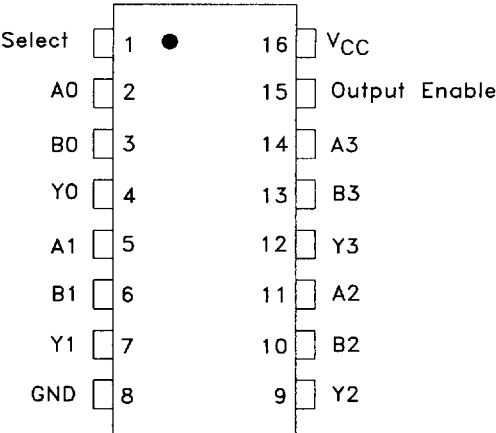
N Suffix  
Plastic DIP  
AVG-003 Case



DW Suffix  
Plastic SOP  
AVG-004 Case



PIN ASSIGNMENT



FUNCTION TABLE

| Inputs        |              |                           |                           | Outputs             |                     |
|---------------|--------------|---------------------------|---------------------------|---------------------|---------------------|
| Output Enable | Select Input | Data Input A <sub>n</sub> | Data Input B <sub>n</sub> | '257 Y <sub>n</sub> | '258 Y <sub>n</sub> |
| H             | X            | X                         | X                         | Z                   | Z                   |
| L             | H            | X                         | L                         | L                   | H                   |
| L             | H            | X                         | H                         | H                   | L                   |
| L             | L            | L                         | X                         | L                   | H                   |
| L             | L            | H                         | X                         | H                   | L                   |

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

257, 258

## ABSOLUTE MAXIMUM RATINGS

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

| Symbol           | Parameter                                        | AC257, ACT257                 | Unit |
|------------------|--------------------------------------------------|-------------------------------|------|
| V <sub>CC</sub>  | DC Supply Voltage (Referenced to GND)            | − 0.5 to +7.0                 | V    |
| V <sub>IN</sub>  | DC Input Voltage (Referenced to GND)             | − 0.5 to V <sub>CC</sub> +0.5 | V    |
| V <sub>OUT</sub> | DC Output Voltage (Referenced to GND)            | − 0.5 to V <sub>CC</sub> +0.5 | V    |
| I <sub>IN</sub>  | DC Input Current, per Pin                        | ± 20                          | mA   |
| I <sub>OUT</sub> | DC Output Sink/Source Current, per Pin           | ± 50                          | mA   |
| I <sub>CC</sub>  | DC V <sub>CC</sub> or GND Current per Output Pin | ± 50                          | mA   |

## GUARANTEED OPERATING CONDITIONS

| Symbol                             | Parameter                                                               |                         | Min | Typ | Max             | Unit |
|------------------------------------|-------------------------------------------------------------------------|-------------------------|-----|-----|-----------------|------|
| V <sub>CC</sub>                    | Supply Voltage                                                          | 'AC                     | 2.0 | 5.0 | 6.0             | V    |
|                                    |                                                                         | 'ACT                    | 4.5 | 5.0 | 5.5             |      |
| V <sub>IN</sub> , V <sub>OUT</sub> | DC Input Voltage, Output Voltage, (Ref. to GND)                         |                         | 0   |     | V <sub>CC</sub> | V    |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise and Fall Time (Note 1)<br>'AC Devices except Schmitt Inputs  | V <sub>CC</sub> @ 3.0 V |     |     | 150             | ns/V |
|                                    |                                                                         | V <sub>CC</sub> @ 4.5 V |     |     | 40              | ns/V |
|                                    |                                                                         | V <sub>CC</sub> @ 5.5 V |     |     | 25              | ns/V |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise and Fall Time (Note 2)<br>'ACT Devices except Schmitt Inputs | V <sub>CC</sub> @ 4.5 V |     |     | 10              | ns/V |
|                                    |                                                                         | V <sub>CC</sub> @ 5.5 V |     |     | 8.0             | ns/V |
| T <sub>A</sub>                     | Operating Ambient Temperature Range                                     |                         | −40 |     | 85              | °C   |
| C <sub>IN</sub>                    | Input Capacitance V <sub>CC</sub> = 5.0 V                               | V <sub>CC</sub> = 5.0 V |     | 4.5 |                 | pF   |
| C <sub>PD</sub>                    | Power Dissipation Capacitance                                           | V <sub>CC</sub> = 5.0 V |     | 50  |                 | pF   |

1. V<sub>IN</sub> from 30% to 70% V<sub>CC</sub>

2. V<sub>IN</sub> from 0.8 to 2.0 V

## AC — 257, 258

## DC ELECTRICAL CHARACTERISTICS

| Symbol          | Parameter                            | Conditions                                            | V <sub>CC</sub><br>(V) | AC257, 258 |                   |                      | Unit |
|-----------------|--------------------------------------|-------------------------------------------------------|------------------------|------------|-------------------|----------------------|------|
|                 |                                      |                                                       |                        | TA = +25°C |                   | TA = −40<br>to +85°C |      |
|                 |                                      |                                                       |                        | Typ        | Guaranteed Limits |                      |      |
| V <sub>IH</sub> | Minimum High Level<br>Input Voltage  | V <sub>OUT</sub> = 0.1V<br>or V <sub>CC</sub> − 0.1 V | 3.0                    | 1.5        | 2.1               | 2.1                  | V    |
|                 |                                      |                                                       | 4.5                    | 2.25       | 3.15              | 3.15                 |      |
|                 |                                      |                                                       | 5.5                    | 2.75       | 3.85              | 3.85                 |      |
| V <sub>IL</sub> | Maximum Low Level<br>Input Voltage   | V <sub>OUT</sub> = 0.1V<br>or V <sub>CC</sub> − 0.1 V | 3.0                    | 1.5        | 0.9               | 0.9                  | V    |
|                 |                                      |                                                       | 4.5                    | 2.25       | 1.35              | 1.35                 |      |
|                 |                                      |                                                       | 5.5                    | 2.75       | 1.65              | 1.65                 |      |
| V <sub>OH</sub> | Minimum High Level<br>Output Voltage | I <sub>OUT</sub> = −50 μA                             | 3.0                    | 2.99       | 2.9               | 2.9                  | V    |
|                 |                                      |                                                       | 4.5                    | 4.49       | 4.4               | 4.4                  |      |
|                 |                                      |                                                       | 5.5                    | 5.49       | 5.4               | 5.4                  |      |
|                 |                                      | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub>  |                        |            |                   |                      | V    |
|                 |                                      | −12mA                                                 | 3.0                    |            | 2.56              | 2.46                 |      |
|                 |                                      | I <sub>OH</sub> −24mA                                 | 4.5                    |            | 3.86              | 3.76                 |      |
|                 |                                      | −24 mA                                                | 5.5                    |            | 4.86              | 4.76                 |      |

257, 258

| Symbol          | Parameter                           | Conditions                                                                                                                                  | V <sub>CC</sub><br>(V) | AC257, 258 |                   |                      | Unit |
|-----------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------|-------------------|----------------------|------|
|                 |                                     |                                                                                                                                             |                        | TA = +25°C |                   | TA = −40<br>to +85°C |      |
|                 |                                     |                                                                                                                                             |                        | Typ        | Guaranteed Limits |                      |      |
| VOL             | MaximumLow Level<br>Output Voltage  | I <sub>OUT</sub> = 50 μA                                                                                                                    | 3.0                    | 0.002      | 0.1               | 0.1                  | V    |
|                 |                                     |                                                                                                                                             | 4.5                    | 0.001      | 0.1               | 0.1                  |      |
|                 |                                     |                                                                                                                                             | 5.5                    | 0.001      | 0.1               | 0.1                  |      |
|                 |                                     | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>12mA<br>I <sub>OL</sub> 24mA<br>24 mA                                               | 3.0                    |            | 0.36              | 0.44                 | V    |
|                 |                                     |                                                                                                                                             | 4.5                    |            | 0.36              | 0.44                 |      |
|                 |                                     |                                                                                                                                             | 5.5                    |            | 0.36              | 0.44                 |      |
| I <sub>IN</sub> | Maximum Input Leakage Current       | V <sub>IN</sub> =V <sub>CC</sub> , GND                                                                                                      | 5.5                    |            | ±0.1              | ±1.0                 | μA   |
| I <sub>OZ</sub> | Maximum 3-State Current             | V <sub>IN</sub> (OE)=V <sub>IL</sub> , V <sub>IH</sub><br>V <sub>IN</sub> =V <sub>CC</sub> , GND<br>V <sub>OUT</sub> =V <sub>CC</sub> , GND | 5.5                    |            | ±0.5              | ±5.0                 | μA   |
| I <sub>CC</sub> | Maximum Quiescent<br>Supply Current | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                                                                    | 5.5                    |            | 8.0               | 80                   | μA   |

## AC CHARACTERISTICS

| Symbol           | Parameter                             | V <sub>CC</sub><br>(V)<br>±10% | AC257                                            |             |                                                               |              | AC258                                            |             |                                                               |              | Unit |
|------------------|---------------------------------------|--------------------------------|--------------------------------------------------|-------------|---------------------------------------------------------------|--------------|--------------------------------------------------|-------------|---------------------------------------------------------------|--------------|------|
|                  |                                       |                                | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |             | T <sub>A</sub> = - 40°C<br>to +85°C<br>C <sub>L</sub> = 50 pF |              | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |             | T <sub>A</sub> = - 40°C to<br>+85°C<br>C <sub>L</sub> = 50 pF |              |      |
|                  |                                       |                                | Min                                              | Max         | Min                                                           | Max          | Min                                              | Max         | Min                                                           | Max          |      |
| t <sub>PLH</sub> | Propagation Delay<br>Input to Output  | 3.3<br>5.0                     | 1.5<br>1.5                                       | 8.5<br>6.5  | 1.0<br>1.0                                                    | 9.0<br>7.0   | 2.0<br>1.5                                       | 9.5<br>7.5  | 1.5<br>1.0                                                    | 11.0<br>8.5  | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>Input to Output  | 3.3<br>5.0                     | 1.5<br>1.5                                       | 8.5<br>6.0  | 1.0<br>1.0                                                    | 9.0<br>7.0   | 2.0<br>1.5                                       | 8.5<br>6.5  | 1.5<br>1.0                                                    | 9.5<br>7.0   | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>Select to Output | 3.3<br>5.0                     | 1.5<br>1.5                                       | 10.5<br>7.5 | 1.5<br>1.0                                                    | 11.5<br>8.5  | 3.0<br>2.0                                       | 12.0<br>9.5 | 2.5<br>1.5                                                    | 14.0<br>10.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>Select to Output | 3.0<br>5.0                     | 1.5<br>1.5                                       | 10.5<br>7.5 | 1.5<br>1.0                                                    | 11.5<br>8.5  | 2.5<br>1.5                                       | 11.5<br>9.0 | 2.0<br>1.5                                                    | 13.0<br>10.0 | ns   |
| t <sub>PZH</sub> | Output Enable Time                    | 3.3<br>5.0                     | 1.5<br>1.5                                       | 9.5<br>7.5  | 1.0<br>1.0                                                    | 10.5<br>8.5  | 2.5<br>1.5                                       | 9.5<br>7.5  | 2.0<br>1.5                                                    | 10.5<br>8.5  | ns   |
| t <sub>PZL</sub> | Output Enable Time                    | 3.3<br>5.0                     | 1.5<br>1.5                                       | 9.0<br>8.5  | 1.0<br>1.0                                                    | 10.5<br>9.5  | 2.0<br>1.5                                       | 9.0<br>7.0  | 1.5<br>1.0                                                    | 10.0<br>8.0  | ns   |
| t <sub>PHZ</sub> | Output Disable Time                   | 3.3<br>5.0                     | 1.5<br>1.5                                       | 10.0<br>9.0 | 1.0<br>1.0                                                    | 11.0<br>10.0 | 2.5<br>2.0                                       | 10.0<br>8.5 | 2.0<br>1.5                                                    | 11.0<br>9.0  | ns   |
| t <sub>PLZ</sub> | Output Disable Time                   | 3.3<br>5.0                     | 2.0<br>1.5                                       | 9.0<br>7.0  | 1.0<br>1.0                                                    | 10.0<br>9.0  | 2.0<br>1.5                                       | 9.0<br>7.0  | 2.0<br>1.5                                                    | 10.0<br>8.0  | ns   |

## ACT — 257, 258

### DC ELECTRICAL CHARACTERISTICS

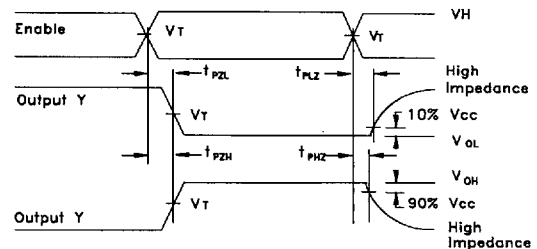
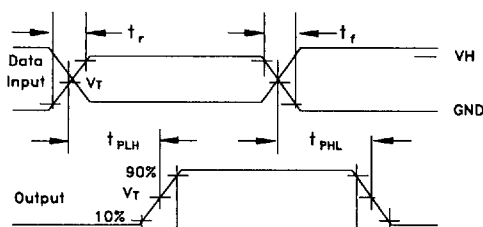
| Symbol          | Parameter                           | Conditions                                            | V <sub>CC</sub><br>(V) | ACT257, 258 |                   |                      | Unit |
|-----------------|-------------------------------------|-------------------------------------------------------|------------------------|-------------|-------------------|----------------------|------|
|                 |                                     |                                                       |                        | TA = +25°C  |                   | TA = −40<br>to +85°C |      |
|                 |                                     |                                                       |                        | Typ         | Guaranteed Limits |                      |      |
| V <sub>IH</sub> | Minimum High Level<br>Input Voltage | V <sub>OUT</sub> = 0.1V<br>or V <sub>CC</sub> − 0.1 V | 4.5<br>5.5             | 1.5<br>1.5  | 2.0<br>2.0        | 2.0<br>2.0           | V    |
| V <sub>IL</sub> | Maximum Low Level<br>Input Voltage  | V <sub>OUT</sub> = 0.1V<br>or V <sub>CC</sub> − 0.1 V | 4.5<br>5.5             | 1.5<br>1.5  | 0.8<br>0.8        | 0.8<br>0.8           | V    |

| Symbol            | Parameter                             | Conditions                                                                                                                                   | V <sub>CC</sub><br>(V) | ACT257, 258    |                   |                      | Unit |
|-------------------|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|-------------------|----------------------|------|
|                   |                                       |                                                                                                                                              |                        | TA = +25°C     |                   | TA = -40<br>to +85°C |      |
|                   |                                       |                                                                                                                                              |                        | Typ            | Guaranteed Limits |                      |      |
| VOH               | Minimum High Level<br>Output Voltage  | I <sub>OUT</sub> = -50 μA                                                                                                                    | 4.5<br>5.5             | 4.49<br>5.49   | 4.4<br>5.4        | 4.4<br>5.4           | V    |
|                   |                                       | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>I <sub>OH</sub> -24mA<br>-24 mA                                                      | 4.5<br>5.5             |                | 3.86<br>4.86      | 3.76<br>4.76         | V    |
| VOL               | MaximumLow Level<br>Output Voltage    | I <sub>OUT</sub> = 50 μA                                                                                                                     | 4.5<br>5.5             | 0.001<br>0.001 | 0.1<br>0.1        | 0.1<br>0.1           | V    |
|                   |                                       | V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>I <sub>OL</sub> 24mA<br>24 mA                                                        | 4.5<br>5.5             |                | 0.36<br>0.36      | 0.44<br>0.44         | V    |
| I <sub>IN</sub>   | Maximum Input Leakage Current         | V <sub>IN</sub> =V <sub>CC</sub> , GND                                                                                                       | 5.5                    |                | ±0.1              | ±1.0                 | μA   |
| ΔI <sub>CCT</sub> | Additional Max I <sub>CC</sub> /Input | V <sub>IN</sub> =V <sub>CC</sub> - 2.1 V                                                                                                     | 5.5                    | 0.6            |                   | 1.5                  | mA   |
| I <sub>OZ</sub>   | Maximum 3-State Current               | V <sub>IN</sub> =(OE)=V <sub>IL</sub> , V <sub>IH</sub><br>V <sub>IN</sub> =V <sub>CC</sub> , GND<br>V <sub>OUT</sub> =V <sub>CC</sub> , GND | 5.5                    |                | ±0.5              | ±5.0                 | μA   |
| I <sub>CC</sub>   | Maximum Quiescent<br>Supply Current   | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                                                                     | 5.5                    |                | 8.0               | 80                   | μA   |

## AC CHARACTERISTICS

| Symbol           | Parameter                             | V <sub>CC</sub><br>(V)<br>±10% | ACT257                                           |      |                                                               |      | ACT258                                           |      |                                                               |      | Unit |
|------------------|---------------------------------------|--------------------------------|--------------------------------------------------|------|---------------------------------------------------------------|------|--------------------------------------------------|------|---------------------------------------------------------------|------|------|
|                  |                                       |                                | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |      | T <sub>A</sub> = − 40°C to<br>+85°C<br>C <sub>L</sub> = 50 pF |      | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |      | T <sub>A</sub> = − 40°C<br>to +85°C<br>C <sub>L</sub> = 50 pF |      |      |
|                  |                                       |                                | Min                                              | Max  | Min                                                           | Max  | Min                                              | Max  | Min                                                           | Max  |      |
| t <sub>PLH</sub> | Propagation Delay<br>Input to Output  | 5.0                            | 1.5                                              | 7.5  | 1.5                                                           | 8.0  | 2.0                                              | 8.5  | 1.5                                                           | 9.5  | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>Input to Output  | 5.0                            | 2.0                                              | 7.5  | 1.5                                                           | 8.5  | 2.0                                              | 7.5  | 1.5                                                           | 8.0  | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>Select to Output | 5.0                            | 2.0                                              | 9.5  | 1.5                                                           | 10.5 | 3.0                                              | 10.5 | 2.0                                                           | 11.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>Select to Output | 5.0                            | 2.5                                              | 10.5 | 2.0                                                           | 11.5 | 1.5                                              | 9.5  | 1.5                                                           | 11.0 | ns   |
| t <sub>PZH</sub> | Output Enable Time                    | 5.0                            | 2.0                                              | 8.0  | 1.5                                                           | 9.0  | 2.0                                              | 8.5  | 1.5                                                           | 9.5  | ns   |
| t <sub>PZL</sub> | Output Enable Time                    | 5.0                            | 2.0                                              | 8.0  | 1.5                                                           | 9.0  | 2.0                                              | 8.5  | 1.5                                                           | 9.5  | ns   |
| t <sub>PHZ</sub> | Output Disable Time                   | 5.0                            | 2.5                                              | 9.0  | 1.5                                                           | 10.0 | 1.5                                              | 9.0  | 1.0                                                           | 10.0 | ns   |
| t <sub>PLZ</sub> | Output Disable Time                   | 5.0                            | 2.0                                              | 7.5  | 1.5                                                           | 8.5  | 2.0                                              | 8.0  | 1.5                                                           | 9.0  | ns   |

## SWITCHING WAVEFORMS



Input and output threshold voltage: V<sub>T</sub> = 50% V<sub>CC</sub> for AC; 1.5V for ACT; V<sub>H</sub> = V<sub>CC</sub> for AC, 3V for ACT