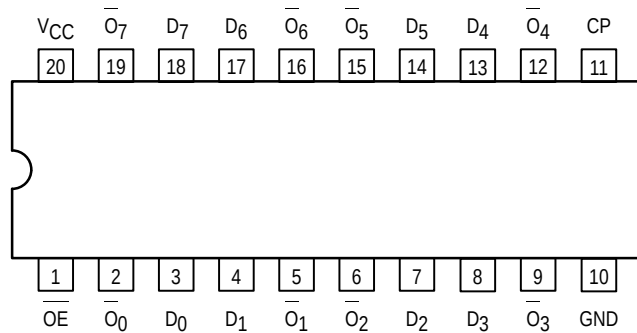


**MOTOROLA**

## Octal D-Type Flip-Flop With 3-State Outputs

The MC74AC534/74ACT534 is a high-speed, low-power octal D-type flip-flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus oriented applications. A buffered Clock (CP) and Output Enable (OE) are common to all flip flops. The 'AC/ACT534 is the same as the 'AC/ACT374 except that the outputs are inverted.

- Edge-Triggered D-Type Inputs
- Buffered Positive Edge-Triggered Clock
- 3-State Outputs for Bus Oriented Applications

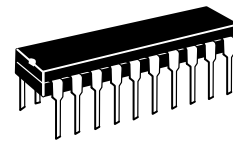


### PIN NAMES

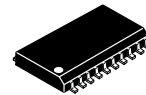
D<sub>0</sub>–D<sub>7</sub> Data Inputs  
 CP Clock Pulse Input  
 $\overline{OE}$  3-State Output Enable Input  
 O<sub>0</sub>–O<sub>7</sub> Complementary 3-State Outputs

**MC74AC534**  
**MC74ACT534**

OCTAL D-TYPE  
 FLIP-FLOP WITH  
 3-STATE OUTPUTS

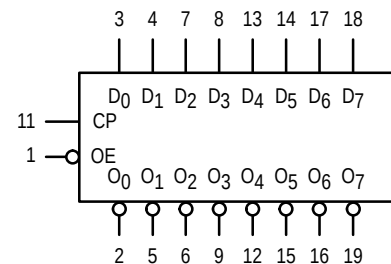


N SUFFIX  
 CASE 738-03  
 PLASTIC



DW SUFFIX  
 CASE 751D-04  
 PLASTIC

### LOGIC SYMBOL



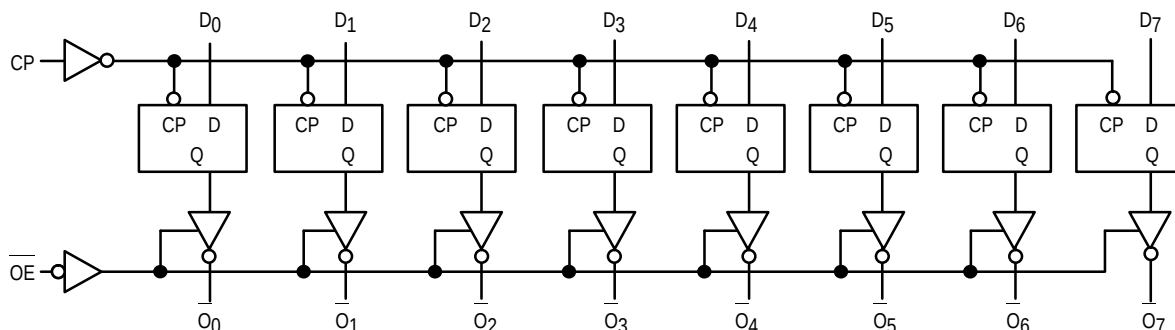
# MC74AC534 MC74ACT534

## FUNCTIONAL DESCRIPTION

The MC74AC534/74ACT534 consists of eight edge-triggered flip-flops with individual D-type inputs and 3-state true outputs. The buffered clock and buffered Output Enable are common to all flip-flops. The eight flip-flops will store the state of their individual D inputs that meet the setup and hold times

requirements on the LOW-to-HIGH Clock (CP) transition. With the Output Enable (OE) LOW, the contents of the eight flip-flops are available at the outputs. When the OE is HIGH, the outputs go to the high impedance state. Operation of the OE input does not affect the state of the flip-flops.

## LOGIC DIAGRAM



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

## MAXIMUM RATINGS\*

| Symbol    | Parameter                                 | Value                  | Unit |
|-----------|-------------------------------------------|------------------------|------|
| $V_{CC}$  | DC Supply Voltage (Referenced to GND)     | -0.5 to +7.0           | V    |
| $V_{in}$  | DC Input Voltage (Referenced to GND)      | -0.5 to $V_{CC} + 0.5$ | V    |
| $V_{out}$ | DC Output Voltage (Referenced to GND)     | -0.5 to $V_{CC} + 0.5$ | V    |
| $I_{in}$  | DC Input Current, per Pin                 | $\pm 20$               | mA   |
| $I_{out}$ | DC Output Sink/Source Current, per Pin    | $\pm 50$               | mA   |
| $I_{CC}$  | DC $V_{CC}$ or GND Current per Output Pin | $\pm 50$               | mA   |
| $T_{stg}$ | Storage Temperature                       | -65 to +150            | °C   |

\* Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

## RECOMMENDED OPERATING CONDITIONS

| Symbol            | Parameter                                                               | Min              | Typ | Max      | Unit |
|-------------------|-------------------------------------------------------------------------|------------------|-----|----------|------|
| $V_{CC}$          | Supply Voltage                                                          | 'AC              | 2.0 | 5.0      | V    |
|                   |                                                                         | 'ACT             | 4.5 | 5.0      |      |
| $V_{in}, V_{out}$ | DC Input Voltage, Output Voltage (Ref. to GND)                          | 0                |     | $V_{CC}$ | V    |
| $t_r, t_f$        | Input Rise and Fall Time (Note 1)<br>'AC Devices except Schmitt Inputs  | $V_{CC} @ 3.0 V$ | 150 |          | ns/V |
|                   |                                                                         | $V_{CC} @ 4.5 V$ | 40  |          |      |
|                   |                                                                         | $V_{CC} @ 5.5 V$ | 25  |          |      |
| $t_r, t_f$        | Input Rise and Fall Time (Note 2)<br>'ACT Devices except Schmitt Inputs | $V_{CC} @ 4.5 V$ | 10  |          | ns/V |
|                   |                                                                         | $V_{CC} @ 5.5 V$ | 8.0 |          |      |
| $T_J$             | Junction Temperature (PDIP)                                             |                  |     | 140      | °C   |
| $T_A$             | Operating Ambient Temperature Range                                     | -40              | 25  | 85       | °C   |
| $I_{OH}$          | Output Current — High                                                   |                  |     | -24      | mA   |
| $I_{OL}$          | Output Current — Low                                                    |                  |     | 24       | mA   |

1.  $V_{in}$  from 30% to 70%  $V_{CC}$ ; see individual Data Sheets for devices that differ from the typical input rise and fall times.

2.  $V_{in}$  from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

# MC74AC534 MC74ACT534

## DC CHARACTERISTICS

| Symbol           | Parameter                            | V <sub>CC</sub><br>(V) | 74AC                   |                   | 74AC                               |    | Unit                                                                                                                                        | Conditions |
|------------------|--------------------------------------|------------------------|------------------------|-------------------|------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                  |                                      |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> =<br>–40°C to +85°C |    |                                                                                                                                             |            |
|                  |                                      |                        | Typ                    | Guaranteed Limits |                                    |    |                                                                                                                                             |            |
| V <sub>IH</sub>  | Minimum High Level<br>Input Voltage  | 3.0                    | 1.5                    | 2.1               | 2.1                                | V  | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 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   | 3.0                    | 1.5                    | 0.9               | 0.9                                | V  | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 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 | 3.0                    | 2.99                   | 2.9               | 2.9                                | V  | I <sub>OUT</sub> = –50 μA                                                                                                                   |            |
|                  |                                      | 4.5                    | 4.49                   | 4.4               | 4.4                                |    |                                                                                                                                             |            |
|                  |                                      | 5.5                    | 5.49                   | 5.4               | 5.4                                |    |                                                                                                                                             |            |
|                  |                                      | 3.0                    |                        | 2.56              | 2.46                               | V  | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>–12 mA<br>I <sub>OH</sub> –24 mA<br>–24 mA                                         |            |
|                  |                                      | 4.5                    |                        | 3.86              | 3.76                               |    |                                                                                                                                             |            |
|                  |                                      | 5.5                    |                        | 4.86              | 4.76                               |    |                                                                                                                                             |            |
| V <sub>OL</sub>  | Maximum Low Level<br>Output Voltage  | 3.0                    | 0.002                  | 0.1               | 0.1                                | V  | I <sub>OUT</sub> = 50 μA                                                                                                                    |            |
|                  |                                      | 4.5                    | 0.001                  | 0.1               | 0.1                                |    |                                                                                                                                             |            |
|                  |                                      | 5.5                    | 0.001                  | 0.1               | 0.1                                |    |                                                                                                                                             |            |
|                  |                                      | 3.0                    |                        | 0.36              | 0.44                               | V  | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>12 mA<br>I <sub>OL</sub> 24 mA<br>24 mA                                            |            |
|                  |                                      | 4.5                    |                        | 0.36              | 0.44                               |    |                                                                                                                                             |            |
|                  |                                      | 5.5                    |                        | 0.36              | 0.44                               |    |                                                                                                                                             |            |
| I <sub>IN</sub>  | Maximum Input<br>Leakage Current     | 5.5                    |                        | ±0.1              | ±1.0                               | μA | V <sub>I</sub> = V <sub>CC</sub> , GND                                                                                                      |            |
| I <sub>OZ</sub>  | Maximum<br>3-State<br>Current        | 5.5                    |                        | ±0.5              | ±5.0                               | μA | V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub><br>V <sub>I</sub> = V <sub>CC</sub> , GND<br>V <sub>O</sub> = V <sub>CC</sub> , GND |            |
| I <sub>OLD</sub> | †Minimum Dynamic<br>Output Current   | 5.5                    |                        |                   | 75                                 | mA | V <sub>OLD</sub> = 1.65 V Max                                                                                                               |            |
| I <sub>OHD</sub> |                                      | 5.5                    |                        |                   | –75                                | mA | V <sub>OHD</sub> = 3.85 V Min                                                                                                               |            |
| I <sub>CC</sub>  | Maximum Quiescent<br>Supply Current  | 5.5                    |                        | 8.0               | 80                                 | μA | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                                                                    |            |

\* All outputs loaded; thresholds on input associated with output under test.

† Maximum test duration 2.0 ms, one output loaded at a time.

Note: I<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V<sub>CC</sub>.

# MC74AC534 MC74ACT534

## AC CHARACTERISTICS (For Figures and Waveforms — See Section 3)

| Symbol           | Parameter                                   | V <sub>CC</sub> *<br>(V) | 74AC                                             |     |              | 74AC                                                         |              | Unit | Fig. No. |
|------------------|---------------------------------------------|--------------------------|--------------------------------------------------|-----|--------------|--------------------------------------------------------------|--------------|------|----------|
|                  |                                             |                          | 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                                              | Typ | Max          | Min                                                          | Max          |      |          |
| f <sub>max</sub> | Maximum Clock Frequency                     | 3.3<br>5.0               | 70<br>150                                        |     | 70<br>150    | 70<br>140                                                    | 70<br>140    | MHz  | 3-3      |
| t <sub>PLH</sub> | Propagation Delay<br>CP to O <sub>N</sub>   | 3.3<br>5.0               | 3.0<br>2.5                                       |     | 14.0<br>10.5 | 2.5<br>2.0                                                   | 16.0<br>12.0 | ns   | 3-6      |
| t <sub>PHL</sub> | Propagation Delay<br>CP to O <sub>N</sub>   | 3.3<br>5.0               | 3.0<br>2.5                                       |     | 13.0<br>9.5  | 2.5<br>2.0                                                   | 15.0<br>11.0 | ns   | 3-6      |
| t <sub>PZH</sub> | Output Enable Time<br>OE to O <sub>N</sub>  | 3.3<br>5.0               | 3.0<br>2.5                                       |     | 12.5<br>10.0 | 2.5<br>2.0                                                   | 14.0<br>11.5 | ns   | 3-7      |
| t <sub>PZL</sub> | Output Enable Time<br>OE to O <sub>N</sub>  | 3.3<br>5.0               | 3.0<br>2.5                                       |     | 12.5<br>10.0 | 2.5<br>2.0                                                   | 14.0<br>11.5 | ns   | 3-8      |
| t <sub>PHZ</sub> | Output Disable Time<br>OE to O <sub>N</sub> | 3.3<br>5.0               | 2.0<br>1.5                                       |     | 13.5<br>11.5 | 1.5<br>1.0                                                   | 15.0<br>12.5 | ns   | 3-7      |
| t <sub>PLZ</sub> | Output Disable Time<br>OE to O <sub>N</sub> | 3.3<br>5.0               | 2.0<br>1.5                                       |     | 12.0<br>10.0 | 1.5<br>1.0                                                   | 13.5<br>11.0 | ns   | 3-8      |

\* Voltage Range 3.3 V is 3.3 V ±0.3 V.  
Voltage Range 5.0 V is 5.0 V ±0.5 V.

## AC OPERATING REQUIREMENTS

| Symbol         | Parameter                                       | V <sub>CC</sub> *<br>(V) | 74AC                                             |                    | 74AC                                                         |    | Unit | Fig.<br>No. |
|----------------|-------------------------------------------------|--------------------------|--------------------------------------------------|--------------------|--------------------------------------------------------------|----|------|-------------|
|                |                                                 |                          | 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 |    |      |             |
|                |                                                 |                          | Typ                                              | Guaranteed Minimum |                                                              |    |      |             |
| t <sub>s</sub> | Setup Time, HIGH or LOW<br>D <sub>n</sub> to CP | 3.3<br>5.0               |                                                  | 5.0<br>3.5         | 6.5<br>4.0                                                   | ns | 3-9  |             |
| t <sub>h</sub> | Hold Time, HIGH or LOW<br>D <sub>n</sub> to CP  | 3.3<br>5.0               |                                                  | 1.0<br>1.0         | 1.5<br>1.5                                                   | ns | 3-9  |             |
| t <sub>w</sub> | CP Pulse Width<br>HIGH or LOW                   | 3.3<br>5.0               |                                                  | 5.0<br>3.5         | 6.5<br>4.0                                                   | ns | 3-6  |             |

\* Voltage Range 3.3 V is 3.3 V ±0.3 V.  
Voltage Range 5.0 V is 5.0 V ±0.5 V.

# MC74AC534 MC74ACT534

## DC CHARACTERISTICS

| Symbol            | Parameter                              | V <sub>CC</sub><br>(V) | 74ACT                  |                   | 74ACT                              |    | Unit                                                                                                                                        | Conditions |
|-------------------|----------------------------------------|------------------------|------------------------|-------------------|------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                   |                                        |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> =<br>–40°C to +85°C |    |                                                                                                                                             |            |
|                   |                                        |                        | Typ                    | Guaranteed Limits |                                    |    |                                                                                                                                             |            |
| V <sub>IH</sub>   | Minimum High Level<br>Input Voltage    | 4.5<br>5.5             | 1.5<br>1.5             | 2.0<br>2.0        | 2.0<br>2.0                         | V  | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                                                                      |            |
| V <sub>IL</sub>   | Maximum Low Level<br>Input Voltage     | 4.5<br>5.5             | 1.5<br>1.5             | 0.8<br>0.8        | 0.8<br>0.8                         | V  | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                                                                      |            |
| V <sub>OH</sub>   | Minimum High Level<br>Output Voltage   | 4.5<br>5.5             | 4.49<br>5.49           | 4.4<br>5.4        | 4.4<br>5.4                         | V  | I <sub>OUT</sub> = –50 μA                                                                                                                   |            |
|                   |                                        | 4.5<br>5.5             |                        | 3.86<br>4.86      | 3.76<br>4.76                       | V  | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>–24 mA<br>I <sub>OH</sub> –24 mA                                                   |            |
| V <sub>OL</sub>   | Maximum Low Level<br>Output Voltage    | 4.5<br>5.5             | 0.001<br>0.001         | 0.1<br>0.1        | 0.1<br>0.1                         | V  | I <sub>OUT</sub> = 50 μA                                                                                                                    |            |
|                   |                                        | 4.5<br>5.5             |                        | 0.36<br>0.36      | 0.44<br>0.44                       | V  | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>24 mA<br>I <sub>OL</sub> 24 mA                                                     |            |
| I <sub>IN</sub>   | Maximum Input<br>Leakage Current       | 5.5                    |                        | ±0.1              | ±1.0                               | μA | V <sub>I</sub> = V <sub>CC</sub> , GND                                                                                                      |            |
| ΔI <sub>CCT</sub> | Additional Max. I <sub>CC</sub> /Input | 5.5                    | 0.6                    |                   | 1.5                                | mA | V <sub>I</sub> = V <sub>CC</sub> – 2.1 V                                                                                                    |            |
| I <sub>OZ</sub>   | Maximum<br>3-State<br>Current          | 5.5                    |                        | ±0.5              | ±5.0                               | μA | V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub><br>V <sub>I</sub> = V <sub>CC</sub> , GND<br>V <sub>O</sub> = V <sub>CC</sub> , GND |            |
| I <sub>OLD</sub>  | †Minimum Dynamic<br>Output Current     | 5.5                    |                        |                   | 75                                 | mA | V <sub>OLD</sub> = 1.65 V Max                                                                                                               |            |
| I <sub>OHD</sub>  |                                        | 5.5                    |                        |                   | –75                                | mA | V <sub>OHD</sub> = 3.85 V Min                                                                                                               |            |
| I <sub>CC</sub>   | Maximum Quiescent<br>Supply Current    | 5.5                    |                        | 8.0               | 80                                 | μA | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                                                                    |            |

\* All outputs loaded; thresholds on input associated with output under test.

† Maximum test duration 2.0 ms, one output loaded at a time.

# MC74AC534 MC74ACT534

## AC CHARACTERISTICS (For Figures and Waveforms — See Section 3)

| Symbol           | Parameter                                   | V <sub>CC</sub> *<br>(V) | 74ACT                                            |     |      | 74ACT                                                        |      | Unit | Fig. No. |
|------------------|---------------------------------------------|--------------------------|--------------------------------------------------|-----|------|--------------------------------------------------------------|------|------|----------|
|                  |                                             |                          | 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                                              | Typ | Max  | Min                                                          | Max  |      |          |
| f <sub>max</sub> | Maximum Clock Frequency                     | 5.0                      |                                                  | 100 |      | 120                                                          |      | MHz  | 3-3      |
| t <sub>PLH</sub> | Propagation Delay<br>CP to O <sub>n</sub>   | 5.0                      | 2.5                                              | 6.5 | 11.5 | 2.0                                                          | 12.5 | ns   | 3-6      |
| t <sub>PHL</sub> | Propagation Delay<br>CP to O <sub>n</sub>   | 5.0                      | 2.0                                              | 6.0 | 10.5 | 2.0                                                          | 12   | ns   | 3-6      |
| t <sub>PZH</sub> | Output Enable Time<br>OE to O <sub>n</sub>  | 5.0                      | 2.5                                              | 6.5 | 12   | 2.0                                                          | 12.5 | ns   | 3-7      |
| t <sub>PZL</sub> | Output Enable Time<br>OE to O <sub>n</sub>  | 5.0                      | 2.0                                              | 6.0 | 11   | 2.0                                                          | 11.5 | ns   | 3-8      |
| t <sub>PHZ</sub> | Output Disable Time<br>OE to O <sub>n</sub> | 5.0                      | 1.5                                              | 7.0 | 12.5 | 1.0                                                          | 13.5 | ns   | 3-7      |
| t <sub>PLZ</sub> | Output Disable Time<br>OE to O <sub>n</sub> | 5.0                      | 1.5                                              | 5.5 | 10.5 | 1.0                                                          | 10.5 | ns   | 3-8      |

\* Voltage Range 5.0 V is 5.0 V ±0.5 V.

## AC OPERATING REQUIREMENTS

| Symbol         | Parameter                                       | V <sub>CC</sub> *<br>(V) | 74ACT                                            |                    | 74ACT                                                        | Unit | Fig.<br>No. |
|----------------|-------------------------------------------------|--------------------------|--------------------------------------------------|--------------------|--------------------------------------------------------------|------|-------------|
|                |                                                 |                          | 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 |      |             |
|                |                                                 |                          | Typ                                              | Guaranteed Minimum |                                                              |      |             |
| t <sub>s</sub> | Setup Time, HIGH or LOW<br>D <sub>n</sub> to CP | 5.0                      | 1.0                                              | 3.5                | 4.0                                                          | ns   | 3-9         |
| t <sub>h</sub> | Hold Time, HIGH or LOW<br>D <sub>n</sub> to CP  | 5.0                      | –1.0                                             | 1.0                | 1.5                                                          | ns   | 3-9         |
| t <sub>w</sub> | CP Pulse Width<br>HIGH or LOW                   | 5.0                      | 2.0                                              | 3.5                | 3.5                                                          | ns   | 3-6         |

\* Voltage Range 5.0 V is 5.0 V ±0.5 V.

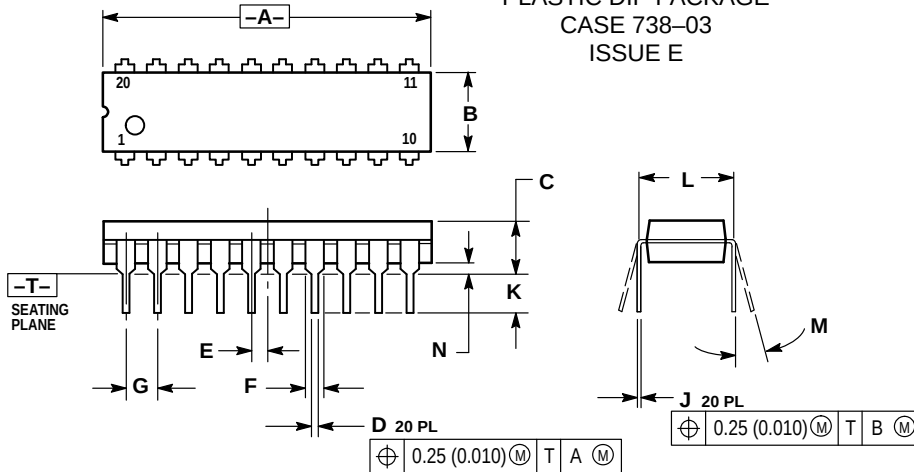
## CAPACITANCE

| Symbol          | Parameter                     | Value<br>Typ | Unit | Test Conditions         |
|-----------------|-------------------------------|--------------|------|-------------------------|
| C <sub>IN</sub> | Input Capacitance             | 4.5          | pF   | V <sub>CC</sub> = 5.0 V |
| C <sub>PD</sub> | Power Dissipation Capacitance | 40           | pF   | V <sub>CC</sub> = 5.0 V |

# MC74AC534 MC74ACT534

## OUTLINE DIMENSIONS

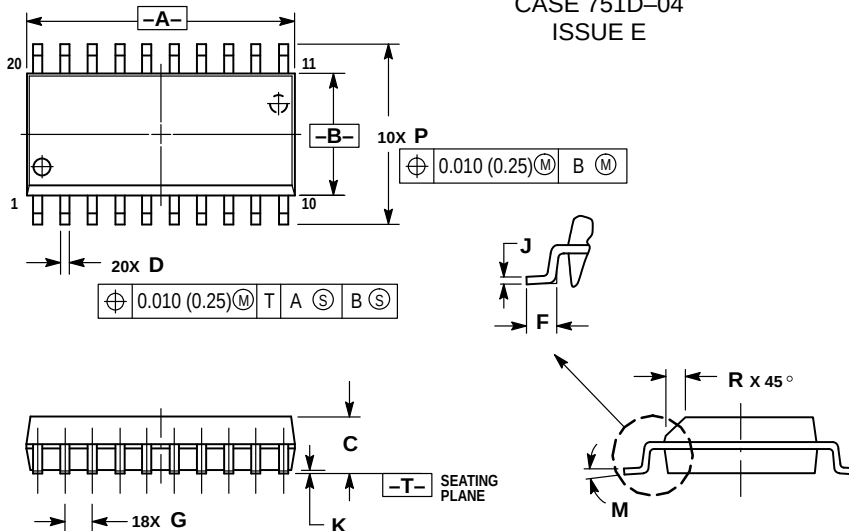
### N SUFFIX PLASTIC DIP PACKAGE CASE 738-03 ISSUE E



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
  4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 1.010     | 1.070 | 25.66       | 27.17 |
| B   | 0.240     | 0.260 | 6.10        | 6.60  |
| C   | 0.150     | 0.180 | 3.81        | 4.57  |
| D   | 0.015     | 0.022 | 0.39        | 0.55  |
| E   | 0.050 BSC |       | 1.27 BSC    |       |
| F   | 0.050     | 0.070 | 1.27        | 1.77  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| J   | 0.008     | 0.015 | 0.21        | 0.38  |
| K   | 0.110     | 0.140 | 2.80        | 3.55  |
| L   | 0.300 BSC |       | 7.62 BSC    |       |
| M   | 0°        | 15°   | 0°          | 15°   |
| N   | 0.020     | 0.040 | 0.51        | 1.01  |

### DW SUFFIX PLASTIC SOIC PACKAGE CASE 751D-04 ISSUE E



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.150 (0.006) PER SIDE.
  5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 (0.005) TOTAL IN EXCESS OF D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 12.65       | 12.95 | 0.499     | 0.510 |
| B   | 7.40        | 7.60  | 0.292     | 0.299 |
| C   | 2.35        | 2.65  | 0.093     | 0.104 |
| D   | 0.35        | 0.49  | 0.014     | 0.019 |
| F   | 0.50        | 0.90  | 0.020     | 0.035 |
| G   | 1.27 BSC    |       | 0.050 BSC |       |
| J   | 0.25        | 0.32  | 0.010     | 0.012 |
| K   | 0.10        | 0.25  | 0.004     | 0.009 |
| M   | 0°          | 7°    | 0°        | 7°    |
| P   | 10.05       | 10.55 | 0.395     | 0.415 |
| R   | 0.25        | 0.75  | 0.010     | 0.029 |

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