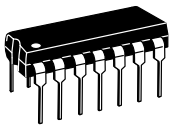
MOTOROLA

# MC74AC126
# MC74ACT126

## Quad Buffer With 3-State Outputs

**QUAD BUFFER**
**WITH 3-STATE OUTPUTS**

- Outputs Source/Sink
- ′ACT126 Has TTL Compatible Inputs
- 3-State Enable Input (Active High)

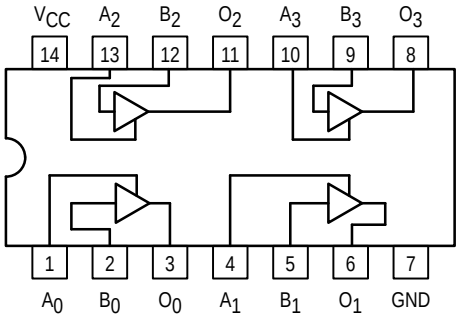


**N SUFFIX**
**CASE 646-06**
**PLASTIC**



**D SUFFIX**
**CASE 751A-03**
**SOIC**

**PIN ASSIGNMENTS**




**PIN NAMES**

| | |
|---|---|
| $A_n$, $B_n$ | Inputs |
| $O_n$ | Outputs |

**FUNCTION TABLE**

| Inputs | | Output |
|---|---|---|
| $A_n$ | $B_n$ | $O_n$ |
| H | L | L |
| H | H | H |
| L | X | Z |

H = High Voltage Level
L = Low Voltage Level
Z = High Impedance
X = Immaterial

**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 | ± 20 | mA |
| $I_{out}$ | DC Output Sink/Source Current, per Pin | ± 50 | mA |
| $I_{CC}$ | DC $V_{CC}$ or GND Current per Output Pin | ± 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 | Min | Unit |
|---|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | ′AC | 2.0 | 5.0 | 6.0 | V |
| | | ′ACT | 4.5 | 5.0 | 5.5 | |
| $V_{in}$, $V_{out}$ | DC Input Voltage, Output Voltage (Ref. to GND) | | 0 | | $V_{CC}$ | V |
| $t_r$, $t_f$ | Input Rise and Fall Time (Note 1) ′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 | | |
| $T_J$ | 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.

## DC CHARACTERISTICS

| Symbol | Parameter | $V_{CC}$ (V) | 74AC $T_A$ = +25°C | 74AC $T_A$ = –40°C to +85°C | | Unit | Conditions |
|---|---|---|---|---|---|---|---|
| | | | Typ | Guaranteed Limits | | | |
| $V_{IH}$ | Minimum High Level Input Voltage | 3.0 | 1.5 | 2.1 | 2.1 | V | $V_{OUT}$ = 0.1 V or $V_{CC}$ – 0.1 V |
| | | 4.5 | 2.25 | 3.15 | 3.15 | | |
| | | 5.5 | 2.75 | 3.85 | 3.85 | | |
| $V_{IL}$ | Maximum Low Level Input Voltage | 3.0 | 1.5 | 0.9 | 0.9 | V | $V_{OUT}$ = 0.1 V or $V_{CC}$ – 0.1 V |
| | | 4.5 | 2.25 | 1.35 | 1.35 | | |
| | | 5.5 | 2.75 | 1.65 | 1.65 | | |
| $V_{OH}$ | Minimum High Level Output Voltage | 3.0 | 2.99 | 2.9 | 2.9 | V | $I_{OUT}$ = – 50 μA |
| | | 4.5 | 4.46 | 4.4 | 4.4 | | |
| | | 5.5 | 5.49 | 5.4 | 5.4 | | |
| | | 3.0 | | 2.56 | 2.46 | V | *$V_{IN}$ = $V_{IL}$ or $V_{IH}$ $I_{OH}$ –12 mA |
| | | 4.5 | | 3.86 | 3.76 | | $I_{OH}$ – 24 mA |
| | | 5.5 | | 4.86 | 4.76 | | $I_{OH}$ – 24 mA |
| $V_{OL}$ | Minimum Low Level Output Voltage | 3.0 | 0.002 | 0.1 | 0.1 | V | $I_{OUT}$ = 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 | *$V_{IN}$ = $V_{IL}$ or $V_{IH}$ $I_{OL}$ 12 mA |
| | | 4.5 | | 0.36 | 0.44 | | $I_{OL}$ 24 mA |
| | | 5.5 | | 0.36 | 0.44 | | $I_{OL}$ 24 mA |
| $I_{IN}$ | Maximum Input Leakage Current | 5.5 | | ±0.1 | ±1.0 | μA | $V_I$ = $V_{CC}$, GND |
| $I_{OZ}$ | $V_I$ (OE) = $V_{IL}$, $V_{IH}$ $V_I$ = $V_{CC}$, GND $V_O$ = $V_{CC}$, GND | 5.5 | | ±0.5 | ±5.0 | μA | $V_I$ (OE) = $V_{IL}$, $V_{IH}$ $V_I$ = $V_{CC}$, GND $V_O$ = $V_{CC}$, GND |
| $I_{OLD}$ | †Minimum Dynamic Output Current | 5.5 | | | 75 | mA | $V_{OLD}$ = 1.65 V Max |
| $I_{OHD}$ | | 5.5 | | | –75 | mA | $V_{OHD}$ = 3.85 V Min |
| $I_{CC}$+ | Maximum Quiescent Supply Current | 5.5 | | 8.0 | 80 | μA | $V_{IN}$ = $V_{CC}$ or GND |

* All outputs loaded; thresholds on input associated with output under test.
† Maximum test duration 2.0 ms, one input loaded at a time.
Note: $I_{IN}$ and $I_{CC}$ @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V.

## AC CHARACTERISTICS

| Symbol | Parameter | $V_{CC}$* (V) | 74AC $T_A$ = +25°C $C_L$ = 50 pF | | 74AC $T_A$ = –40°C to +85°C $C_L$ = 50 pF | | Unit |
|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | |
| $t_{PLH}$ | Propagation Delay Data to Output | 3.3<br>5.0 | 2.0<br>1.5 | 9.0<br>6.5 | 1.5<br>1.0 | 10<br>7.5 | ns |
| $t_{PHL}$ | Propagation Delay Data to Output | 3.3<br>5.0 | 2.0<br>1.5 | 9.0<br>6.5 | 1.5<br>1.0 | 10<br>7.5 | ns |
| $t_{PZH}$ | Output Enable Time | 3.3<br>5.0 | 2.0<br>1.5 | 11<br>8.5 | 1.5<br>1.0 | 12<br>9.5 | ns |
| $t_{PZL}$ | Output Enable Time | 3.3<br>5.0 | 2.0<br>1.5 | 11<br>8.5 | 1.5<br>1.0 | 12<br>9.5 | ns |
| $t_{PHZ}$ | Output Disable Time | 3.3<br>5.0 | 2.0<br>1.5 | 12<br>9.5 | 1.5<br>1.0 | 13<br>10.5 | ns |
| $t_{PLZ}$ | Output Disable Time | 3.3<br>5.0 | 2.0<br>1.5 | 12<br>9.5 | 1.5<br>1.0 | 13<br>10.5 | ns |

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

## DC CHARACTERISTICS

| Symbol | Parameter | $V_{CC}$ (V) | 74ACT $T_A$ = +25°C | | 74ACT $T_A$ = –40°C to +85°C | Unit | Conditions |
|---|---|---|---|---|---|---|---|
| | | | Typ | Guaranteed Limits | | | |
| $V_{IH}$ | Minimum High Level Input Voltage | 4.5<br>5.5 | 1.5<br>1.5 | 2.2<br>2.0 | 2.0<br>2.0 | V | $V_{OUT}$ = 0.1 V or $V_{CC}$ – 0.1 V |
| $V_{IL}$ | Maximum Low Level Input Voltage | 4.5<br>5.5 | 1.5<br>1.5 | 0.8<br>0.8 | 0.8<br>0.8 | V | $V_{OUT}$ = 0.1 V or $V_{CC}$ – 0.1 V |
| $V_{OH}$ | Minimum High Level Output Voltage | 4.5<br>5.5 | 4.49<br>5.49 | 4.4<br>5.4 | 4.4<br>5.4 | V | $I_{OUT}$ = – 50 μA |
| | | 4.5<br>5.5 | | 3.86<br>4.86 | 3.76<br>4.76 | V | *$V_{IN}$ = $V_{IL}$ or $V_{IH}$<br>$I_{OH}$ – 24 mA<br>– 24 mA |
| $V_{OL}$ | Minimum Low Level Output Voltage | 4.5<br>5.5 | 0.001<br>0.001 | 0.1<br>0.1 | 0.1<br>0.1 | V | $I_{OUT}$ = – 50 μA |
| | | 4.5<br>5.5 | | 0.36<br>0.36 | 0.44<br>0.44 | V | *$V_{IN}$ = $V_{IL}$ or $V_{IH}$<br>$I_{OH}$ – 24 mA<br>– 24 mA |
| $I_{IN}$ | Maximum Input Leakage Current | 5.5 | | ±0.1 | ±1.0 | μA | $V_I$ = $V_{CC}$, GND |
| $I_{OZ}$ | $V_I$ (OE) = $V_{IL}$, $V_{IH}$<br>$V_I$ = $V_{CC}$, GND<br>$V_O$ = $V_{CC}$ , GND | 5.5 | | ±0.5 | ±5.0 | μA | $V_I$ (OE) = $V_{IL}$, $V_{IH}$<br>$V_I$ = $V_{CC}$, GND<br>$V_O$ = $V_{CC}$ , GND |
| $\Delta I_{CCT}$ | Additional Max. $I_{CC}$/Input | 5.5 | 0.6 | | 1.5 | mA | $V_I$ = $V_{CC}$ – 2.1 V |
| $I_{OLD}$ | †Minimum Dynamic Output Current | 5.5 | | | 75 | mA | $V_{OLD}$ = 1.65 V Max |
| $I_{OHD}$ | | 5.5 | | | –75 | mA | $V_{OHD}$ = 3.85 V Min |
| $I_{CC}$ | Maximum Quiescent Supply Current | 5.5 | | 8.0 | 80 | μA | $V_{IN}$ = $V_{CC}$ or GND |

* All outputs loaded; thresholds on input associated with output under test.
† Maximum test duration 2.0 ms, one input loaded at a time.

**AC CHARACTERISTICS**

| Symbol | Parameter | $V_{CC}$* (V) | 74ACT $T_A$ = +25°C $C_L$ = 50 pF | | 74ACT $T_A$ = –40°C to +85°C $C_L$ = 50 pF | | Unit |
|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | |
| $t_{PLH}$ | Propagation Delay Data to Output | 5.0 | 1.5 | 8.5 | 1.0 | 9.5 | ns |
| $t_{PHL}$ | Propagation Delay Data to Output | 5.0 | 1.5 | 8.5 | 1.0 | 9.5 | ns |
| $t_{PZH}$ | Output Enable Time | 5.0 | 1.5 | 9.0 | 1.0 | 10 | ns |
| $t_{PZL}$ | Output Enable Time | 5.0 | 1.5 | 9.0 | 1.0 | 10 | ns |
| $t_{PHZ}$ | Output Disable Time | 5.0 | 1.5 | 10.5 | 1.0 | 11.5 | ns |
| $t_{PLZ}$ | Output Disable Time | 5.0 | 1.5 | 10.5 | 1.0 | 11.5 | ns |

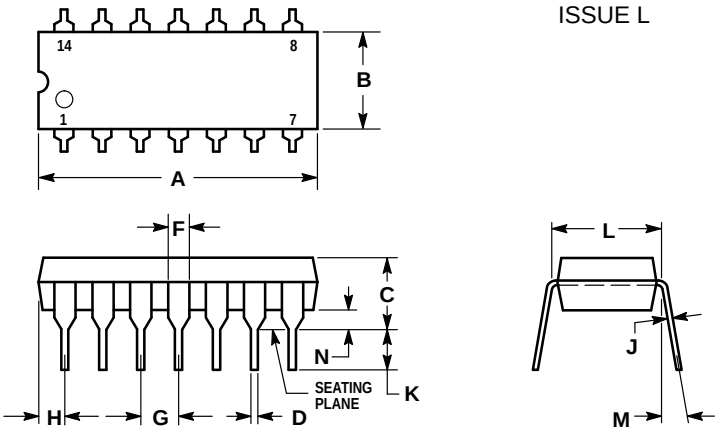
* Voltage Range 5.0 V is 5.0 V ±0.5 V.

**CAPACITANCE**

| Symbol | Parameter | Value Typ | Unit | Test Conditions |
|---|---|---|---|---|
| $C_{IN}$ | Input Capacitance | 4.5 | pF | $V_{CC}$ = 5.0 V |
| $C_{PD}$ | Power Dissipation Capacitance | 45 | pF | $V_{CC}$ = 5.0 V |

## OUTLINE DIMENSIONS

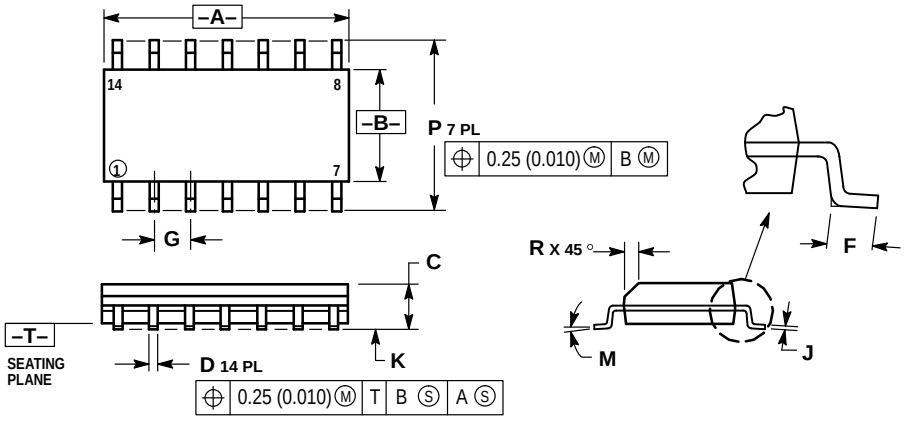
**N SUFFIX**
PLASTIC DIP PACKAGE
CASE 646–06
ISSUE L




NOTES:
1. LEADS WITHIN 0.13 (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
3. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
4. ROUNDED CORNERS OPTIONAL.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.715 | 0.770 | 18.16 | 19.56 |
| B | 0.240 | 0.260 | 6.10 | 6.60 |
| C | 0.145 | 0.185 | 3.69 | 4.69 |
| D | 0.015 | 0.021 | 0.38 | 0.53 |
| F | 0.040 | 0.070 | 1.02 | 1.78 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.052 | 0.095 | 1.32 | 2.41 |
| J | 0.008 | 0.015 | 0.20 | 0.38 |
| K | 0.115 | 0.135 | 2.92 | 3.43 |
| L | 0.300 BSC | | 7.62 BSC | |
| M | 0° | 10° | 0° | 10° |
| N | 0.015 | 0.039 | 0.39 | 1.01 |

**D SUFFIX**
PLASTIC SOIC PACKAGE
CASE 751A–03
ISSUE F




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 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 8.55 | 8.75 | 0.337 | 0.344 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.054 | 0.068 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.40 | 1.25 | 0.016 | 0.049 |
| G | 1.27 BSC | | 0.050 BSC | |
| J | 0.19 | 0.25 | 0.008 | 0.009 |
| K | 0.10 | 0.25 | 0.004 | 0.009 |
| M | 0 ° | 7 ° | 0 ° | 7 ° |
| P | 5.80 | 6.20 | 0.228 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |

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