

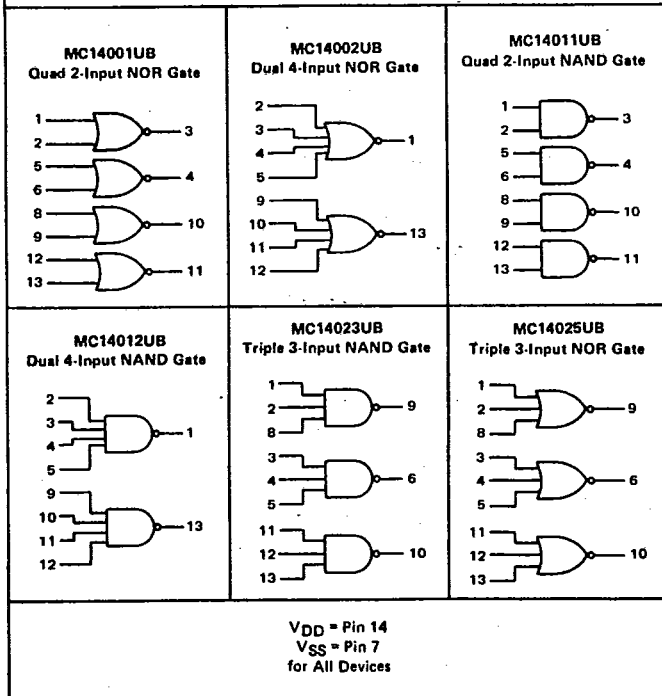


UB-SUFFIX SERIES CMOS GATES

The UB Series logic gates are constructed with P and N channel enhancement mode devices in a single monolithic structure (Complementary MOS). Their primary use is where low power dissipation and/or high noise immunity is desired. The UB set of CMOS gates are inverting non-buffered functions.

- Supply Voltage Range = 3.0 Vdc to 18 Vdc
- Linear and Oscillator Applications
- Capable of Driving Two Low-power TTL Loads or One Low-power Schottky TTL Load Over the Rated Temperature Range.
- Double Diode Protection on All Inputs
- Pin-for-Pin Replacements for Corresponding CD4000 Series UB Suffix Devices

LOGIC DIAGRAMS



MC14001UB
Quad 2-Input NOR Gate

MC14002UB
Dual 4-Input NOR Gate

MC14011UB
Quad 2-Input NAND Gate

MC14012UB
Dual 4-Input NAND Gate

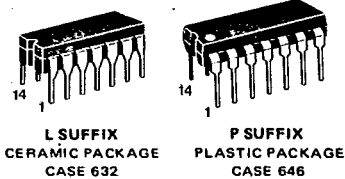
MC14023UB
Triple 3-Input NAND Gate

MC14025UB
Triple 3-Input NOR Gate

CMOS SSI

(LOW-POWER COMPLEMENTARY MOS)

UB-SERIES GATES



ORDERING INFORMATION

A Series: -55°C to +125°C
MC14XXXUBAL (Ceramic Package Only)

C Series: -40°C to +85°C
MC14XXXUBCP (Plastic Package)
MC14XXXUBCL (Ceramic Package)

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation, V_{in} and V_{out} should be constrained to the range V_{SS} ≤ (V_{in} or V_{out}) ≤ V_{DD}.

Unused inputs must always be tied to an appropriate logic voltage level (e.g., either V_{SS} or V_{DD}). Unused outputs must be left open.

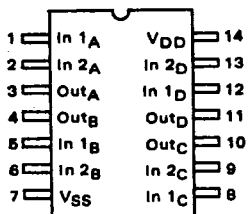
6

CMOS UB-SERIES GATES

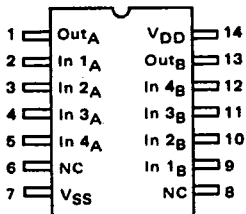
T-43-21

PIN ASSIGNMENTS

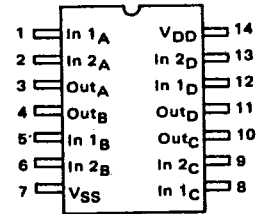
MC14001UB
Quad 2-Input NOR Gate



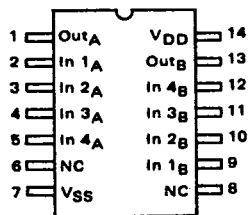
MC14002UB
Dual 4-Input NOR Gate



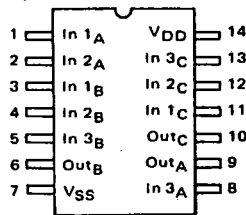
MC14011UB
Quad 2-Input NAND Gate



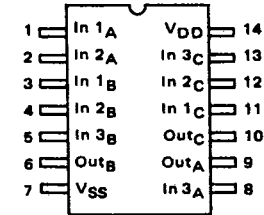
MC14012UB
Dual 4-Input NAND Gate



MC14023UB
Triple 3-Input NAND Gate



MC14025UB
Triple 3-Input NOR Gate



NC = No Connection



MAXIMUM RATINGS* (Voltages Referenced to V_{SS})

| Symbol | Parameter | Value | Unit |
|-----------------------|--|-------------------------------|------|
| V _{DD} | DC Supply Voltage | -0.5 to +18.0 | V |
| V _{in, Vout} | Input or Output Voltage (DC or Transient) | -0.5 to V _{DD} + 0.5 | V |
| I _{in, Iout} | Input or Output Current (DC or Transient), per Pin | ±10 | mA |
| P _D | Power Dissipation, per Package† | 500 | mW |
| T _{stg} | Storage Temperature | -65 to +150 | °C |
| T _L | Lead Temperature (8-Second Soldering) | 260 | °C |

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

†Temperature Derating: Plastic "P" Package: -12mW/°C from 65°C to 85°C
Ceramic "L" Package: -12mW/°C from 100°C to 125°C

CMOS UB-SERIES GATES

T-43-21

ELECTRICAL CHARACTERISTICS (Voltages Referenced to V_{SS})

| Characteristic | Symbol | V _{DD} V _{dC} | T _{low} ^a | | 25°C | | | T _{high} ^a | | Unit |
|---|--|------------------------------------|--|------|-------|----------|------|--------------------------------|------|------------------|
| | | | Min | Max | Min | Typ # | Max | Min | Max | |
| Output Voltage V _{in} = V _{DD} or 0 | VOL | 5.0 | — | 0.05 | — | 0 | 0.05 | — | 0.05 | V _{dC} |
| | | 10 | — | 0.05 | — | 0 | 0.05 | — | 0.05 | |
| | | 15 | — | 0.05 | — | 0 | 0.05 | — | 0.05 | |
| V _{in} = 0 or V _{DD} | VOH | 5.0 | 4.95 | — | 4.95 | 5.0 | — | 4.95 | — | V _{dC} |
| | | 10 | 9.95 | — | 9.95 | 10 | — | 9.95 | — | |
| | | 15 | 14.95 | — | 14.95 | 15 | — | 14.95 | — | |
| Input Voltage (V _O = 4.5 V _{dC}) (V _O = 9.0 V _{dC}) (V _O = 13.5 V _{dC}) | "0" Level V _{IL} | 5.0 | — | 1.0 | — | 2.25 | 1.0 | — | 1.0 | V _{dC} |
| | | 10 | — | 2.0 | — | 4.50 | 2.0 | — | 2.0 | |
| | | 15 | — | 2.5 | — | 6.75 | 2.5 | — | 2.5 | |
| | "1" Level V _{IH} | 5.0 | 4.0 | — | 4.0 | 2.75 | — | 4.0 | — | V _{dC} |
| | | 10 | 8.0 | — | 8.0 | 5.50 | — | 8.0 | — | |
| | | 15 | 12.5 | — | 12.5 | 8.25 | — | 12.5 | — | |
| Output Drive Current (AL Device) | Source I _{OH} | 5.0 | -1.2 | — | -1.0 | -1.7 | — | -0.7 | — | mA _{dC} |
| | | 5.0 | -0.25 | — | -0.2 | -0.36 | — | -0.14 | — | |
| | | 10 | -0.62 | — | -0.5 | -0.9 | — | -0.35 | — | |
| | Sink I _{OL} | 5.0 | 0.64 | — | 0.51 | 0.88 | — | 0.36 | — | mA _{dC} |
| | | 10 | 1.6 | — | 1.3 | 2.25 | — | 0.9 | — | |
| | | 15 | 4.2 | — | 3.4 | 8.8 | — | 2.4 | — | |
| Output Drive Current (CL/CP Device) | Source I _{OH} | 5.0 | -1.0 | — | -0.8 | -1.7 | — | -0.6 | — | mA _{dC} |
| | | 5.0 | -0.2 | — | -0.16 | -0.36 | — | -0.12 | — | |
| | | 10 | -0.5 | — | -0.4 | -0.9 | — | -0.3 | — | |
| | Sink I _{OL} | 5.0 | 0.52 | — | 0.44 | 0.88 | — | 0.36 | — | mA _{dC} |
| | | 10 | 1.3 | — | 1.1 | 2.25 | — | 0.9 | — | |
| | | 15 | 3.6 | — | 3.0 | 8.8 | — | 2.4 | — | |
| Input Current (AL Device) | I _{in} | 15 | — | ±0.1 | — | ±0.00001 | ±0.1 | — | ±1.0 | μA _{dC} |
| Input Current (CL/CP Device) | I _{in} | 15 | — | ±0.3 | — | ±0.00001 | ±0.3 | — | ±1.0 | μA _{dC} |
| Input Capacitance (V _{in} = 0) | C _{in} | — | — | — | — | 5.0 | 7.5 | — | — | pF |
| Quiescent Current (AL Device) (Per Package) | I _{DD} | 5.0 | — | 0.25 | — | 0.0005 | 0.25 | — | 7.5 | μA _{dC} |
| | | 10 | — | 0.5 | — | 0.0010 | 0.5 | — | 15 | |
| | | 15 | — | 1.0 | — | 0.0015 | 1.0 | — | 30 | |
| Quiescent Current (CL/CP Device) (Per Package) | I _{DD} | 5.0 | — | 1.0 | — | 0.0005 | 1.0 | — | 7.5 | μA _{dC} |
| | | 10 | — | 2.0 | — | 0.0010 | 2.0 | — | 15 | |
| | | 15 | — | 4.0 | — | 0.0015 | 4.0 | — | 30 | |
| Total Supply Current**† (Dynamic plus Quiescent, Per Gate, C _L = 50 pF) | I _T | 5.0 | I _T = (0.3 μA/kHz) f + I _{DD} /N | | | | | | | μA _{dC} |
| 10 | I _T = (0.6 μA/kHz) f + I _{DD} /N | | | | | | | | | |
| 15 | I _T = (0.8 μA/kHz) f + I _{DD} /N | | | | | | | | | |

^aT_{low} = -55°C for AL Device, -40°C for CL/CP Device.
T_{high} = +125°C for AL Device, +85°C for CL/CP Device.

#Data labelled "Typ" is not to be used for design purposes but is intended as an indication of the IC's potential performance.

**The formulas given are for the typical characteristics only at 25°C.

†To calculate total supply current at loads other than 50 pF:

$$I_T(C_L) = I_T(50 \text{ pF}) + (C_L - 50) V/k$$

where: I_T is in μH (per package), C_L in pF, V = (V_{DD} - V_{SS}) in volts, f in kHz is input frequency, and k = 0.001 × the number of exercised gates per package.

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CMOS UB-SERIES GATES

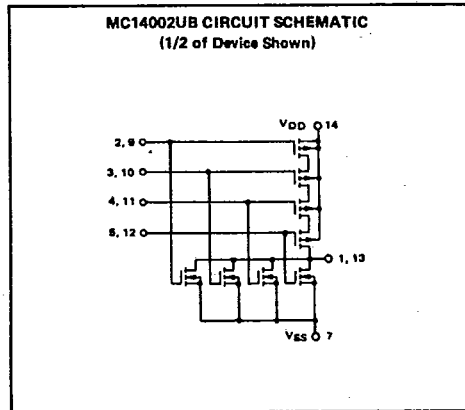
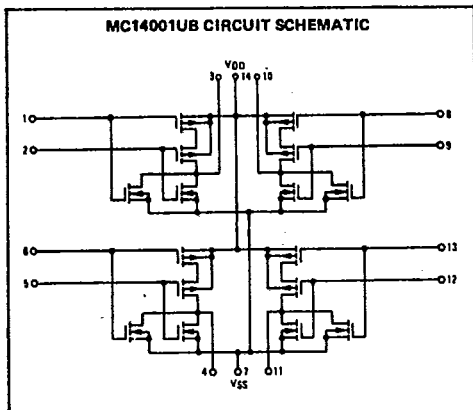
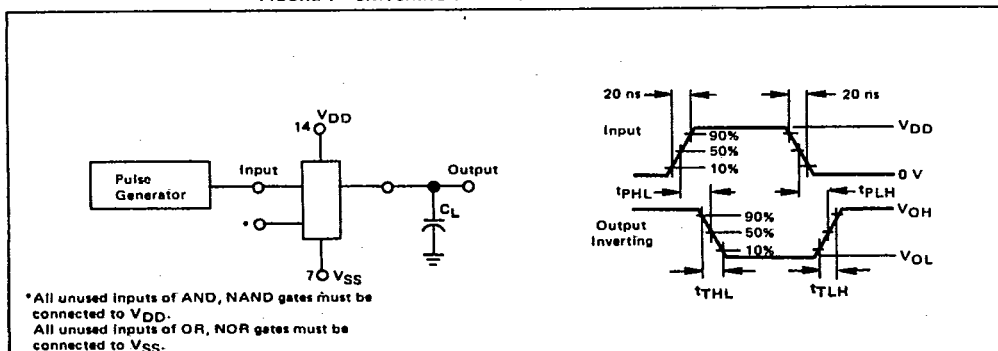
SWITCHING CHARACTERISTICS* (C_L = 50 pF, T_A = 25°C)

| Characteristic | Symbol | V _{DD} Vdc | Min | Typ # | Max | Unit |
|--|--------------------|------------------------|-------------|-----------------|-------------------|------|
| Output Rise Time $t_{TLH} = (3.0 \text{ ns/pF}) C_L + 30 \text{ ns}$ $t_{TLH} = (1.5 \text{ ns/pF}) C_L + 15 \text{ ns}$ $t_{TLH} = (1.1 \text{ ns/pF}) C_L + 10 \text{ ns}$ | t_{TLH} | 5.0 10 15 | — — — | 180 90 65 | 360 180 130 | ns |
| Output Fall Time $t_{THL} = (1.5 \text{ ns/pF}) C_L + 25 \text{ ns}$ $t_{THL} = (0.75 \text{ ns/pF}) C_L + 12.5 \text{ ns}$ $t_{THL} = (0.65 \text{ ns/pF}) C_L + 9.5 \text{ ns}$ | t_{THL} | 5.0 10 15 | — — — | 100 50 40 | 200 100 80 | ns |
| Propagation Delay Time $t_{PLH}, t_{PHL} = (1.7 \text{ ns/pF}) C_L + 30 \text{ ns}$ $t_{PLH}, t_{PHL} = (0.66 \text{ ns/pF}) C_L + 22 \text{ ns}$ $t_{PLH}, t_{PHL} = (0.50 \text{ ns/pF}) C_L + 15 \text{ ns}$ | t_{PLH}, t_{PHL} | 5.0 10 15 | — — — | 90 50 40 | 180 100 80 | ns |

*The formulas given are for the typical characteristics only at 25°C.

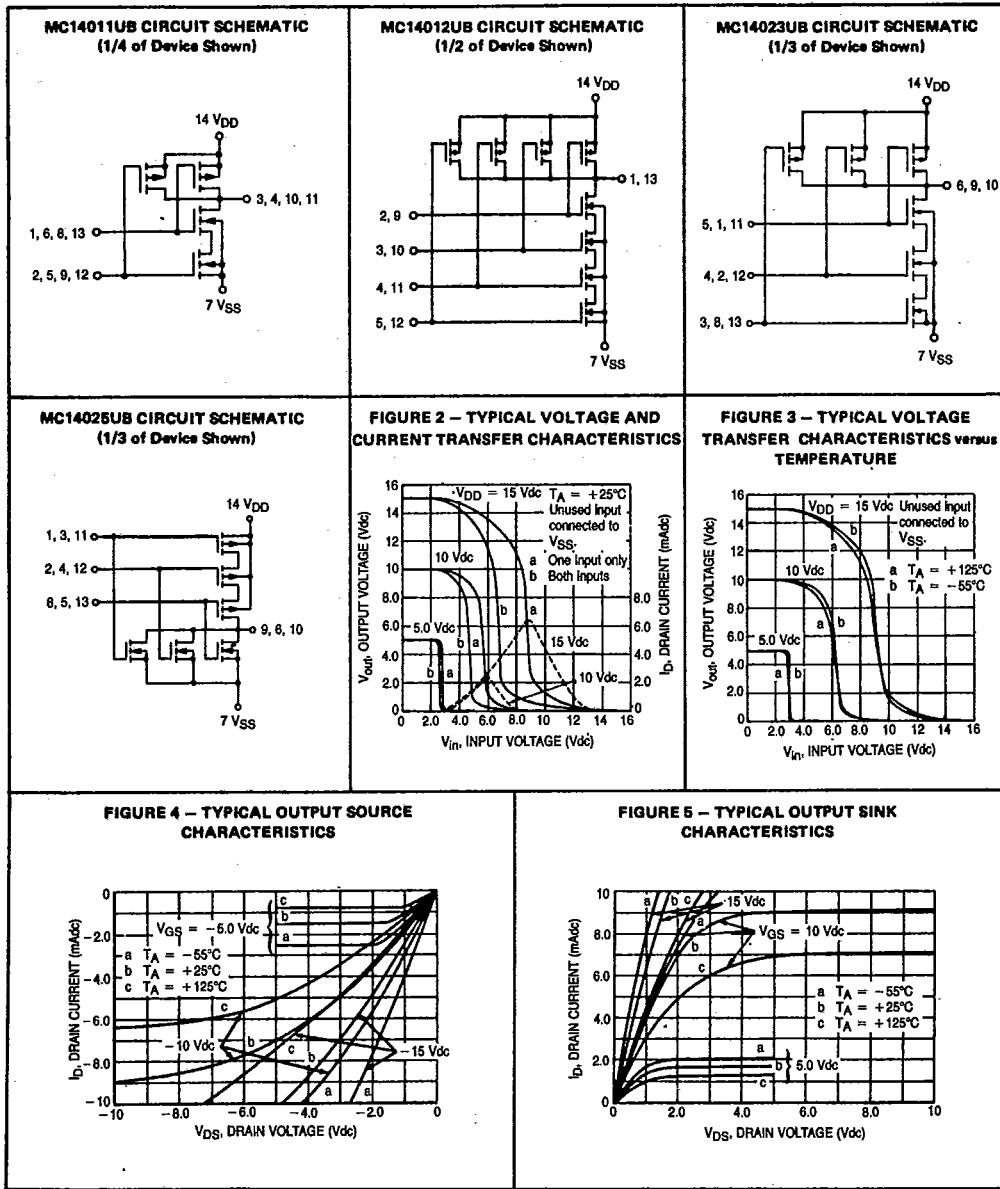
#Data labelled "Typ" is not to be used for design purposes but is intended as an indication of the IC's potential performance.

FIGURE 1 - SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



CMOS UB-SERIES GATES

T-43-21



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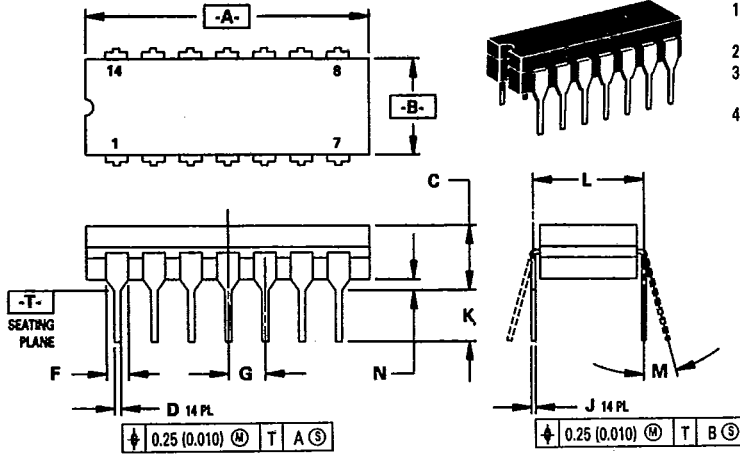
PACKAGE DIMENSIONS

T-90-20

The standard package availability for each device is indicated on the front page of the individual data sheets. Dimensions for the packages are given in this chapter. Surface mount packages may be special ordered by specifying the following suffixes: "D" (narrow SOIC), "DW" (wide SOIC), or "FN" (PLCC). For example, to order a quad NOR gate, use MC14001BD.

14-PIN PACKAGE

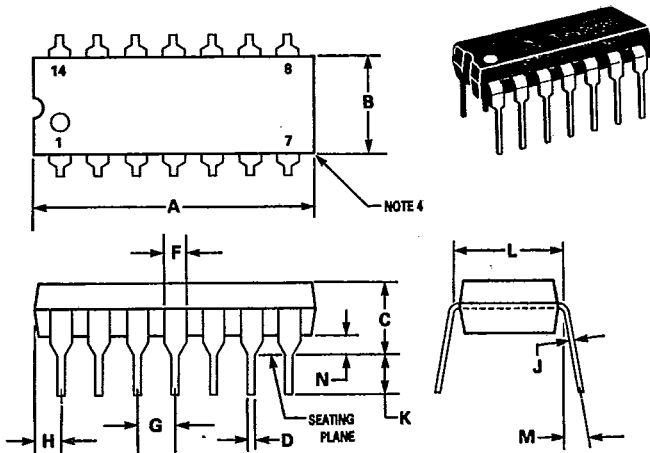
**CERAMIC PACKAGE
CASE 632-08**



- 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. DIM F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 19.05 | 19.94 | 0.750 | 0.785 |
| B | 6.23 | 7.11 | 0.245 | 0.280 |
| C | 3.94 | 5.08 | 0.155 | 0.200 |
| D | 0.39 | 0.50 | 0.015 | 0.020 |
| F | 1.40 | 1.65 | 0.055 | 0.065 |
| G | 2.54 BSC | | 0.100 BSC | |
| J | 0.21 | 0.38 | 0.008 | 0.015 |
| K | 3.18 | 4.31 | 0.125 | 0.170 |
| L | 7.62 BSC | | 0.300 BSC | |
| M | 0° | 15° | 0° | 15° |
| N | 0.51 | 1.01 | 0.020 | 0.040 |

**PLASTIC PACKAGE
CASE 646-06**



- NOTES:
1. LEADS WITHIN 0.13 mm (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.

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

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PACKAGE DIMENSIONS (Continued)

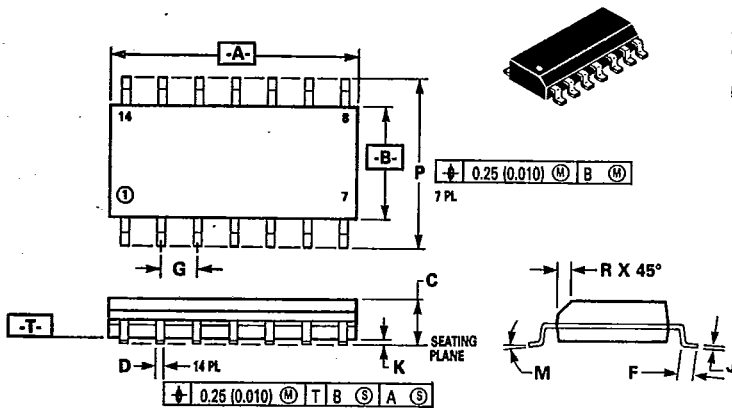
14-PIN PACKAGE

SOIC PACKAGE
CASE 751A-02
D SUFFIX

NOTES:

1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM SURFACE.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
3. CONTROLLING DIMENSION: MILLIMETER.
4. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
5. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.

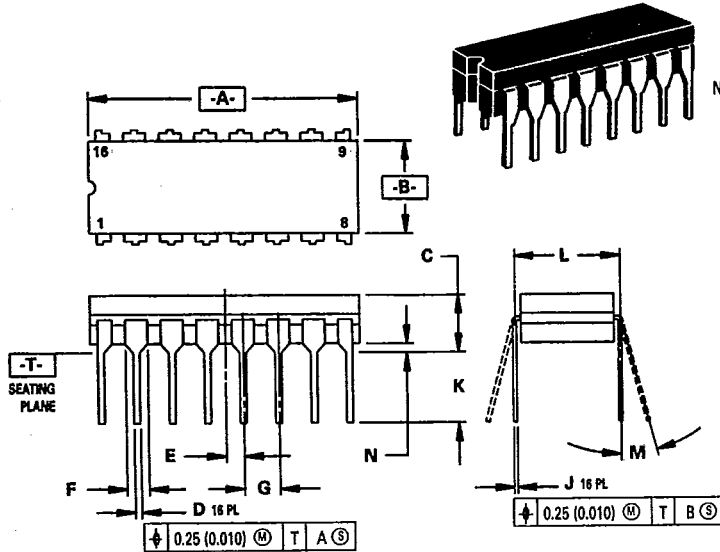
| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 8.55 | 8.75 | 0.337 | 0.344 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.054 | 0.068 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.40 | 1.25 | 0.016 | 0.049 |
| G | 1.27 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 | 0.229 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |



PACKAGE DIMENSIONS (Continued)

16-PIN PACKAGE

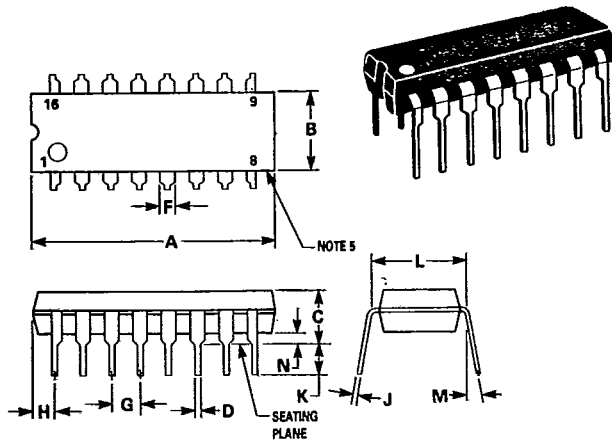
CERAMIC PACKAGE
CASE 620-09



- 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. DIM F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 19.05 | 19.55 | 0.750 | 0.770 |
| B | 6.10 | 7.36 | 0.240 | 0.290 |
| C | — | 4.19 | — | 0.165 |
| D | 0.39 | 0.53 | 0.015 | 0.021 |
| E | 1.27 BSC | | 0.050 BSC | |
| F | 1.40 | 1.77 | 0.055 | 0.070 |
| G | 2.54 BSC | | 0.100 BSC | |
| J | 0.23 | 0.27 | 0.009 | 0.011 |
| K | — | 5.08 | — | 0.200 |
| L | 7.62 BSC | | 0.300 BSC | |
| M | 0° | 15° | 0° | 15° |
| N | 0.39 | 0.88 | 0.015 | 0.035 |

PLASTIC PACKAGE
CASE 648-06



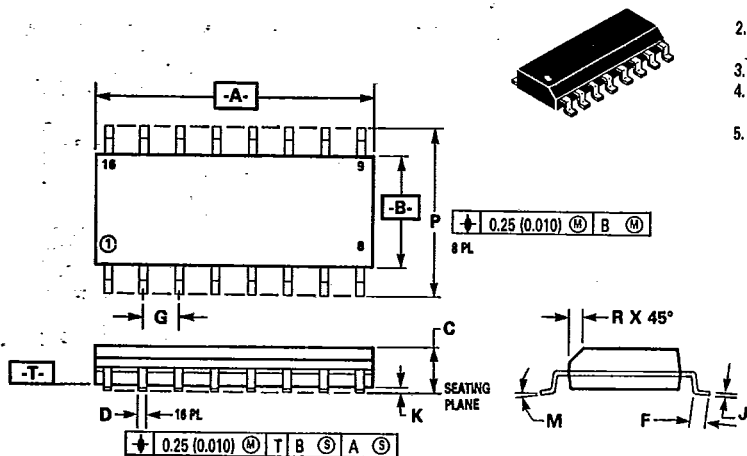
- NOTES:
1. LEADS WITHIN 0.13 mm (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
 2. DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.
 3. DIMENSION "B" DOES NOT INCLUDE MOLD FLASH.
 4. "F" DIMENSION IS FOR FULL LEADS.
 5. ROUNDED CORNERS OPTIONAL.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 18.80 | 21.34 | 0.740 | 0.840 |
| B | 6.10 | 6.60 | 0.240 | 0.260 |
| C | 3.69 | 4.69 | 0.145 | 0.185 |
| D | 0.38 | 0.53 | 0.015 | 0.021 |
| F | 1.02 | 1.78 | 0.040 | 0.070 |
| G | 2.54 BSC | | 0.100 BSC | |
| H | 0.38 | 2.41 | 0.015 | 0.095 |
| J | 0.20 | 0.38 | 0.008 | 0.015 |
| K | 2.92 | 3.43 | 0.115 | 0.135 |
| L | 7.62 BSC | | 0.300 BSC | |
| M | 0° | 10° | 0° | 10° |
| N | 0.39 | 1.01 | 0.015 | 0.040 |

PACKAGE DIMENSIONS (Continued)

16-PIN PACKAGE

SOIC PACKAGE
CASE 751B-03
D SUFFIX

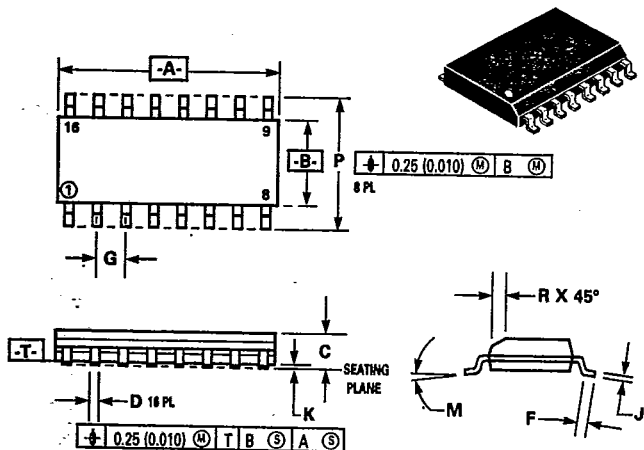


NOTES:

1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM SURFACE.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
3. CONTROLLING DIMENSION: MILLIMETER.
4. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
5. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 9.80 | 10.00 | 0.386 | 0.393 |
| 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 | 0.229 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |

SOIC PACKAGE
CASE 751G-01
DW SUFFIX



NOTES:

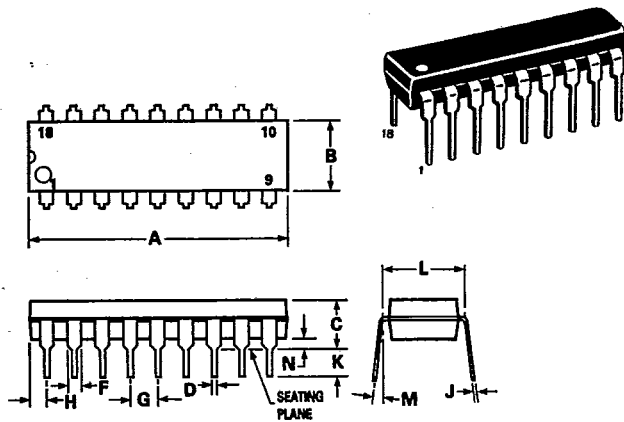
1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM SURFACE.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
3. CONTROLLING DIMENSION: MILLIMETER.
4. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
5. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 10.15 | 10.45 | 0.400 | 0.411 |
| 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 |
| | 0.25 | 0.75 | 0.010 | 0.029 |

PACKAGE DIMENSIONS (Continued)

18-PIN PACKAGE

PLASTIC PACKAGE
CASE 707-02

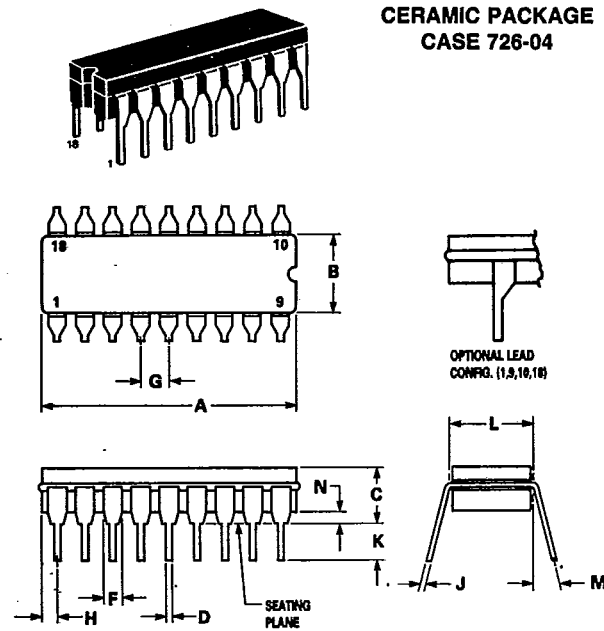


NOTES:

1. POSITIONAL TOLERANCE OF LEADS (D), SHALL BE WITHIN 0.25mm(0.010) AT MAXIMUM MATERIAL CONDITION, IN RELATION TO SEATING PLANE AND EACH OTHER.
2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
3. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 22.22 | 23.24 | 0.875 | 0.915 |
| B | 6.10 | 6.60 | 0.240 | 0.260 |
| C | 3.56 | 4.57 | 0.140 | 0.180 |
| D | 0.36 | 0.56 | 0.014 | 0.022 |
| F | 1.27 | 1.78 | 0.050 | 0.070 |
| G | 2.54 BSC | | 0.100 BSC | |
| H | 1.02 | 1.52 | 0.040 | 0.060 |
| J | 0.20 | 0.30 | 0.008 | 0.012 |
| K | 2.92 | 3.43 | 0.115 | 0.135 |
| L | 7.62 BSC | | 0.300 BSC | |
| M | 0° | 15° | 0° | 15° |
| N | 0.51 | 1.02 | 0.020 | 0.040 |

CERAMIC PACKAGE
CASE 726-04



NOTES:

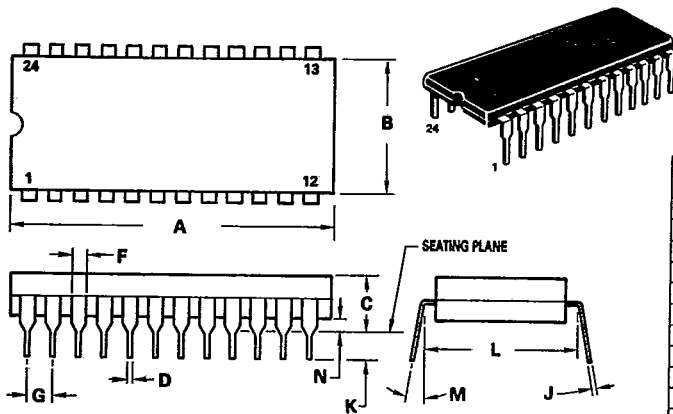
1. LEADS, TRUE POSITIONED WITHIN 0.25 mm (0.010) DIA. AT SEATING PLANE, AT MAXIMUM MATERIAL CONDITION.
2. DIM "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.
3. DIM "A" & "B" INCLUDES MENISCUS.
4. "F" DIMENSION IS FOR FULL LEADS. "HALF" LEADS ARE OPTIONAL AT LEAD POSITIONS 1, 9, 10, AND 18.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 22.35 | 23.11 | 0.880 | 0.910 |
| B | 6.10 | 7.49 | 0.240 | 0.295 |
| C | — | 5.08 | — | 0.200 |
| D | 0.38 | 0.53 | 0.015 | 0.021 |
| F | 1.40 | 1.78 | 0.055 | 0.070 |
| G | 2.54 BSC | | 0.100 BSC | |
| H | 0.51 | 1.14 | 0.020 | 0.045 |
| J | 0.20 | 0.30 | 0.008 | 0.012 |
| K | 3.18 | 4.32 | 0.125 | 0.170 |
| L | 7.62 BSC | | 0.300 BSC | |
| M | 0° | 15° | 0° | 15° |
| N | 0.51 | 1.02 | 0.020 | 0.040 |

PACKAGE DIMENSIONS (Continued)

24-PIN PACKAGE

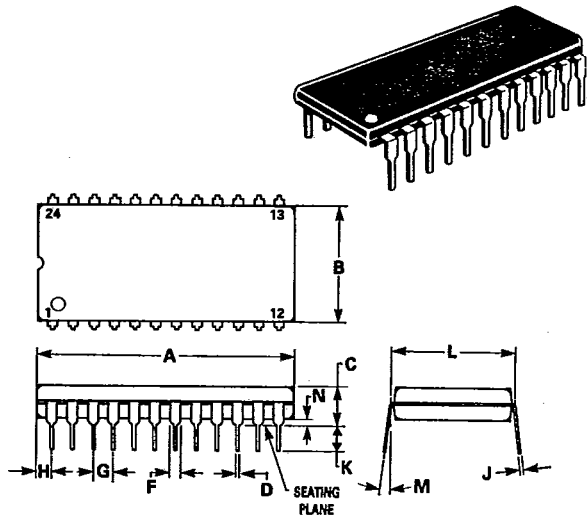
CERAMIC PACKAGE
CASE 623-05



- NOTES:
1. DIM "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.
 2. LEADS WITHIN 0.13 mm (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION. (WHEN FORMED PARALLEL).

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 31.24 | 32.77 | 1.230 | 1.290 |
| B | 12.70 | 15.49 | 0.500 | 0.610 |
| C | 4.06 | 5.59 | 0.160 | 0.220 |
| D | 0.41 | 0.51 | 0.016 | 0.020 |
| F | 1.27 | 1.52 | 0.050 | 0.060 |
| G | 2.54 BSC | | 0.100 BSC | |
| J | 0.20 | 0.30 | 0.008 | 0.012 |
| K | 3.18 | 4.06 | 0.125 | 0.160 |
| L | 15.24 BSC | | 0.600 BSC | |
| M | 0° | 15° | 0° | 15° |
| N | 0.51 | 1.27 | 0.020 | 0.050 |

PLASTIC PACKAGE
CASE 709-02



- NOTES:
1. POSITIONAL TOLERANCE OF LEADS (D), SHALL BE WITHIN 0.25 mm (0.010) AT MAXIMUM MATERIAL CONDITION, IN RELATION TO SEATING PLANE AND EACH OTHER.
 2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
 3. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 31.37 | 32.13 | 1.235 | 1.265 |
| B | 13.72 | 14.22 | 0.540 | 0.560 |
| C | 3.94 | 5.08 | 0.155 | 0.200 |
| D | 0.36 | 0.56 | 0.014 | 0.022 |
| F | 1.02 | 1.52 | 0.040 | 0.060 |
| G | 2.54 BSC | | 0.100 BSC | |
| H | 1.65 | 2.03 | 0.065 | 0.080 |
| J | 0.20 | 0.38 | 0.008 | 0.015 |
| K | 2.92 | 3.43 | 0.115 | 0.135 |
| L | 15.24 BSC | | 0.600 BSC | |
| M | 0° | 15° | 0° | 15° |
| N | 0.51 | 1.02 | 0.020 | 0.040 |