

## 8-Bit Bus-Compatible Latches

The MC14597B and MC14598B are 8-bit latches, one addressed with an internal counter and the other addressed with an external binary address. The 8 latch-outputs are high drive, three-state and bus line compatible. The drive capability allows direct applications with MPU systems such as the Motorola 6800 family.

With MC14597B, a 3-bit address counter (clocked on the falling edge of Increment) selects the appropriate latch. The latches of the MC14598B are accessed via the Address pins, A0, A1, and A2. A Full Flag is provided on the MC14597B to indicate the position of the Address counter.

All 8 outputs from the latches are available in parallel when  $\overline{\text{Enable}}$  is in the low state. Data is entered into a selected latch from the Data pin when the Strobe is high. Master reset is available on both parts.

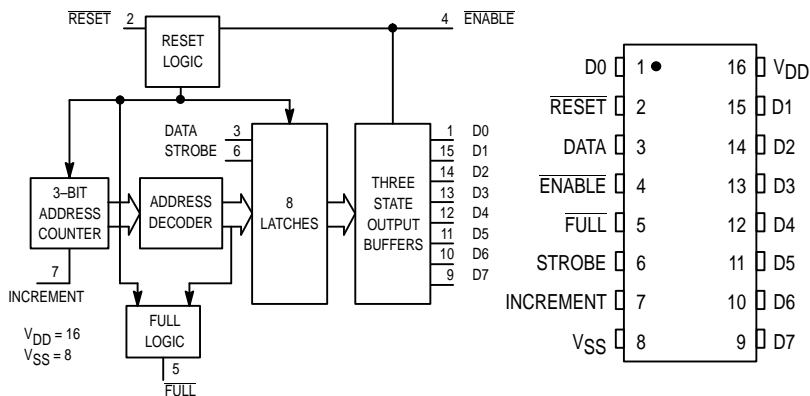
- Serial Data Input
- Three-State Bus Compatible Parallel Outputs
- Three-State Control Pin ( $\overline{\text{Enable}}$ ) TTL Compatible Input
- Open Drain  $\overline{\text{Full}}$  Flag (Multiple Latch Wire-O Ring)
- Master Reset
- Level Shifting Inputs on All Except  $\overline{\text{Enable}}$
- Diode Protection — All Inputs
- Supply Voltage Range — 3.0 Vdc to 18 Vdc
- Capable of Driving TTL Over Rated Temperature Range

With Fanout as Follows:

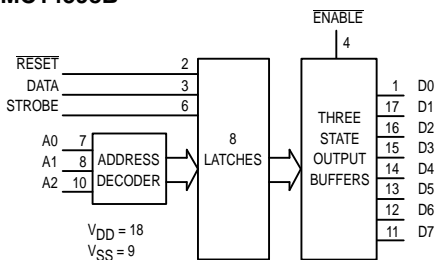
- 1 TTL Load
- 4 LSTTL Loads

### BLOCK DIAGRAMS

#### MC14597B



#### MC14598B



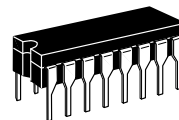
### OUTPUT TRUTH TABLE

Enable	Outputs
1	High Impedance
0	$D_n$

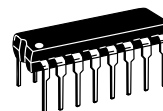
$D_n$  = State of nth latch

NC = NO CONNECTION

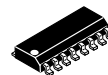
## MC14597B MC14598B



**L SUFFIX**  
CERAMIC  
CASE 620



**P SUFFIX**  
PLASTIC  
CASE 648

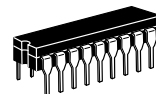


**D SUFFIX**  
SOIC  
CASE 751B

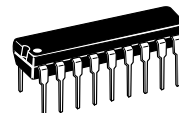
### ORDERING INFORMATION

MC14597BCP	Plastic
MC14597BCL	Ceramic
MC14597BDW	SOIC

$T_A = -55^\circ$  to  $125^\circ\text{C}$  for all packages.



**L SUFFIX**  
CERAMIC  
CASE 726



**P SUFFIX**  
PLASTIC  
CASE 707

### ORDERING INFORMATION

MC14598BCP	Plastic
MC14598BCL	Ceramic

$T_A = -55^\circ$  to  $125^\circ\text{C}$  for all packages.



**MAXIMUM RATINGS\*** (Voltages Referenced to V<sub>SS</sub>)

Symbol	Parameter	Value	Unit
V <sub>DD</sub>	DC Supply Voltage	- 0.5 to + 18.0	V
V <sub>in</sub>	Input Voltage, Enable (DC or Transient)	- 0.5 to V <sub>DD</sub> + 0.5	V
V <sub>in</sub>	Input Voltage, All other Inputs (DC or Transient)	- 0.5 to V <sub>DD</sub> + 12	V
V <sub>out</sub>	Output Voltage (DC or Transient)	- 0.5 to V <sub>DD</sub> + 0.5	V
I <sub>in</sub> , I <sub>out</sub>	Input or Output Current (DC or Transient), per Pin	± 10	mA
P <sub>D</sub>	Power Dissipation, per Package†	500	mW
T <sub>stg</sub>	Storage Temperature	- 65 to + 150	°C
T <sub>L</sub>	Lead Temperature (8-Second Soldering)	260	°C

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<sub>in</sub> and V<sub>out</sub> should be constrained to the range V<sub>SS</sub> ≤ (V<sub>in</sub> or V<sub>out</sub>) ≤ V<sub>DD</sub>. Unused inputs must always be tied to an appropriate logic voltage level (e.g., either V<sub>SS</sub> or V<sub>DD</sub>). Unused outputs must be left open.

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

† Temperature Derating:

"P and D/DW" Packages: - 7.0 mW/C From 65°C To 125°C Ceramic

"L" Packages: - 12 mW/°C From 100°C To 125°C

**ELECTRICAL CHARACTERISTICS** (Voltages Referenced to V<sub>SS</sub>)

Characteristic	Symbol	V <sub>DD</sub> Vdc	- 55°C		25°C			125°C		Unit
			Min	Max	Min	Typ #	Max	Min	Max	
Output Voltage V <sub>in</sub> = V <sub>DD</sub> or 0	"0" Level V <sub>OL</sub>	5.0	—	0.05	—	0	0.05	—	0.05	Vdc
		10	—	0.05	—	0	0.05	—	0.05	
V <sub>in</sub> = 0 or V <sub>DD</sub>	"1" Level V <sub>OH</sub>	5.0	4.95	—	4.95	5.0	—	4.95	—	Vdc
		10	9.95	—	9.95	10	—	9.95	—	
Input Voltage** — Enable (V <sub>O</sub> = 4.5 or 0.5 Vdc) (V <sub>O</sub> = 9.0 or 1.0 Vdc) (V <sub>O</sub> = 13.5 or 1.5 Vdc)	"0" Level V <sub>IL</sub>	5.0	—	0.8	—	1.1	0.8	—	0.8	Vdc
		10	—	1.6	—	2.2	1.6	—	1.6	
(V <sub>O</sub> = 0.5 or 4.5 Vdc) (V <sub>O</sub> = 1.0 or 9.0 Vdc) (V <sub>O</sub> = 1.5 or 13.5 Vdc)	"1" Level V <sub>IH</sub>	5.0	2.0	—	2.0	1.9	—	2.0	—	Vdc
		10	6.0	—	6.0	3.1	—	6.0	—	
Input Voltage Other Inputs (V <sub>O</sub> = 4.5 or 0.5 Vdc) (V <sub>O</sub> = 9.0 or 1.0 Vdc) (V <sub>O</sub> = 13.5 or 1.5 Vdc)	"0" Level V <sub>IL</sub>	5.0	—	1.5	—	2.25	1.5	—	1.5	Vdc
		10	—	3.0	—	4.50	3.0	—	3.0	
(V <sub>O</sub> = 0.5 or 4.5 Vdc) (V <sub>O</sub> = 1.0 or 9.0 Vdc) (V <sub>O</sub> = 1.5 or 13.5 Vdc)	"1" Level V <sub>IH</sub>	5.0	3.5	—	3.5	2.75	—	3.5	—	Vdc
		10	7.0	—	7.0	5.50	—	7.0	—	
Output Drive Current (Full — Sink Only) (V <sub>OH</sub> = 4.6 Vdc) (V <sub>OH</sub> = 9.5 Vdc) (V <sub>OH</sub> = 13.5 Vdc)	Source I <sub>OH</sub>	5.0	- 1.0	—	- 1.0	- 2.0	—	- 1.0	—	mA <sub>dc</sub>
	10	—	—	—	- 6.0	—	—	—	—	
(V <sub>OL</sub> = 0.4 Vdc) (V <sub>OL</sub> = 0.5 Vdc) (V <sub>OL</sub> = 1.5 Vdc)	Sink I <sub>OL</sub>	5.0	1.6	—	1.6	3.2	—	1.6	—	mA <sub>dc</sub>
	10	—	—	—	6.0	—	—	—	—	
15	—	—	—	—	12	—	—	—	—	
Input Current	I <sub>in</sub>	15	—	±0.1	—	±0.00001	±0.1	—	±1.0	μA <sub>dc</sub>
Three-State Leakage Current	I <sub>TL</sub>	15	—	±0.1	—	±0.00001	±0.1	—	±3.0	μA <sub>dc</sub>
Input Capacitance (V <sub>in</sub> = 0)	C <sub>in</sub>	—	—	—	—	5.0	7.5	—	—	pF
Quiescent Current (Per Package)	I <sub>DD</sub>	5.0	—	5.0	—	0.005	5.0	—	150	μA <sub>dc</sub>
		10	—	10	—	0.010	10	—	300	
		15	—	20	—	0.015	20	—	600	
**Total Supply Current at an External Load Capacitance of 130 pF	I <sub>T</sub>	5.0	I <sub>T</sub> = (2.0 μA/kHz) f + I <sub>DD</sub> I <sub>T</sub> = (4.0 μA/kHz) f + I <sub>DD</sub> I <sub>T</sub> = (6.0 μA/kHz) f + I <sub>DD</sub>							μA <sub>dc</sub>
10										

† 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.

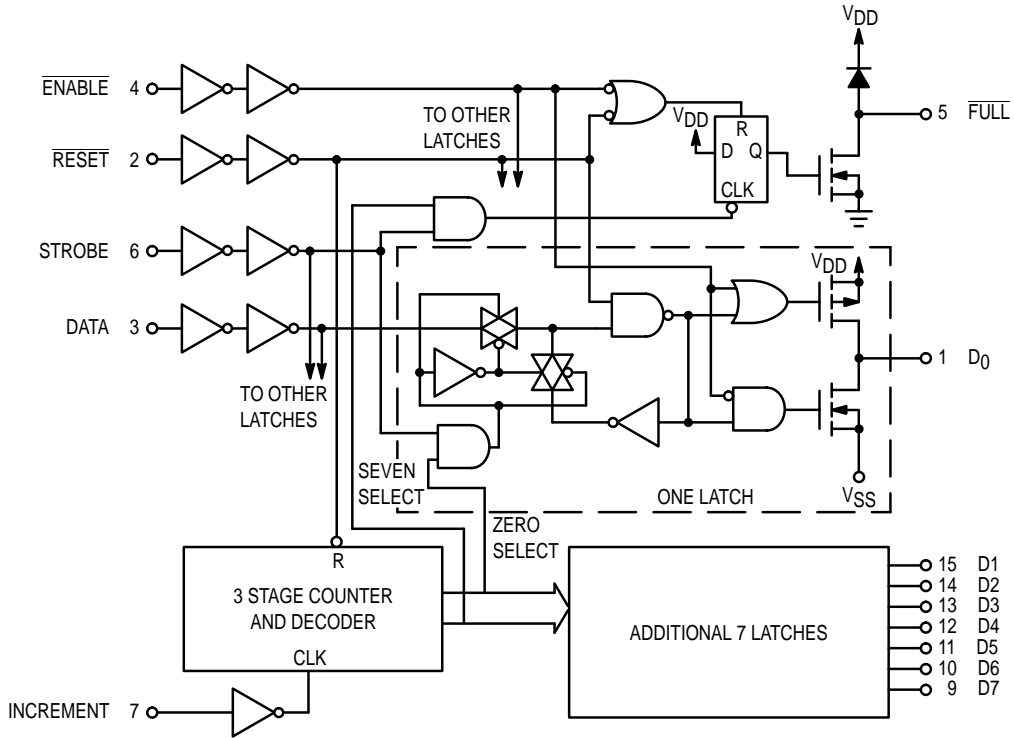
**SWITCHING CHARACTERISTICS\*** ( $T_A = 25^\circ\text{C}$ ,  $C_L = 130\text{ pF} + 1\text{ TTL Load}$ )

Characteristic	Symbol	V <sub>DD</sub> Vdc	All Types			Unit	
			Min	Typ #	Max		
Output Rise and Fall Time t <sub>TLH</sub> , t <sub>THL</sub> = (0.5 ns/pF) C <sub>L</sub> + 35 ns t <sub>TLH</sub> , t <sub>THL</sub> = (0.2 ns/pF) C <sub>L</sub> + 25 ns t <sub>TLH</sub> , t <sub>THL</sub> = (0.16 ns/pF) C <sub>L</sub> + 20 ns	t <sub>TLH</sub> , t <sub>THL</sub>	5.0 10 15	— — —	100 50 40	200 100 80	ns	
Propagation Delay Time Enable to Output	t <sub>PLH</sub> , t <sub>PHL</sub>	5.0 10 15	— — —	160 125 100	320 250 200	ns	
Strobe to Output		5.0 10 15	— — —	200 100 80	400 200 160		
Strobe to $\overline{\text{Full}}$ (MC14597B only)		5.0 10 15	— — —	200 100 80	400 200 160		
$\overline{\text{Reset}}$ to Output		5.0 10 15	— — —	175 90 70	350 180 140		
Pulse Width $\overline{\text{Enable}}$	t <sub>WH</sub> , t <sub>WL</sub>	5.0 10 15	320 240 160	160 120 80	— — —		
Strobe		5.0 10 15	200 100 80	100 50 40	— — —		
Increment (MC14597B only)		5.0 10 15	200 100 80	100 50 40	— — —		
$\overline{\text{Reset}}$		5.0 10 15	300 160 100	150 80 50	— — —		
Setup Time Data	t <sub>su</sub>	5.0 10 15	100 50 35	50 25 20	— — —		ns
Address (MC14598B only)		5.0 10 15	200 100 70	100 50 35	— — —		
Increment (MC14597B only)		5.0 10 15	400 200 170	200 100 85	— — —		
Hold Time Data	t <sub>h</sub>	5.0 10 15	100 50 35	50 25 20	— — —		
Address (MC14598B only)		5.0 10 15	100 50 35	50 25 20	— — —		
Reset Removal Time	t <sub>rem</sub>	5.0 10 15	20 20 20	-25 -15 -10	— — —	ns	

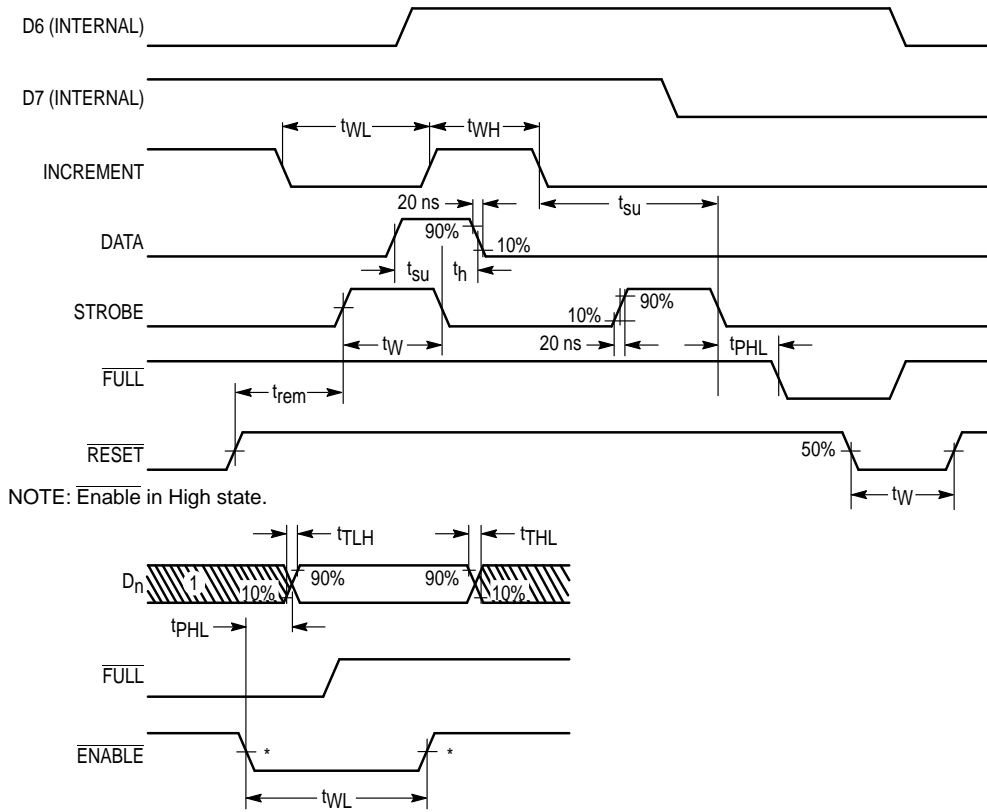
\* The formulas given are for the typical characteristics only at 25°C.

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

### MC14597B FUNCTION DIAGRAM



### MC14597B TIMING DIAGRAMS

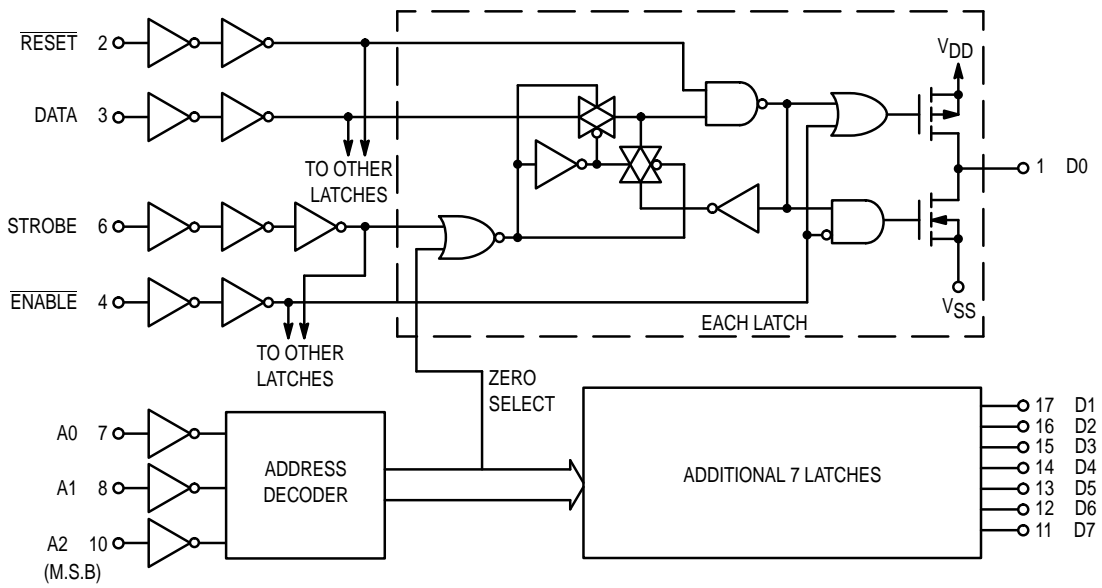


\* 1.4 V with  $V_{DD} = 5.0$  V

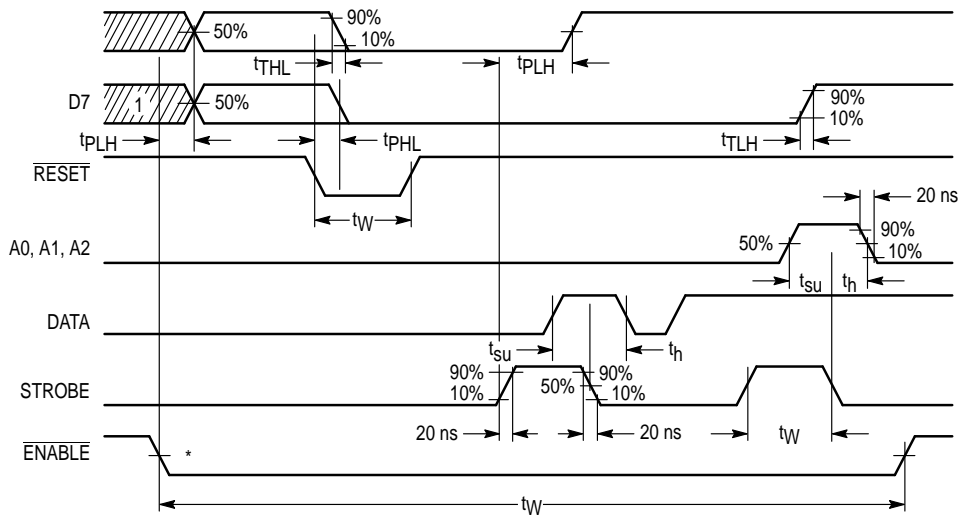
**NOTES:**

1. High-impedance output state (another device controls bus).
2. Reset in High state.

### MC14598B FUNCTION DIAGRAM



### MC14598B TIMING DIAGRAM



\* 1.4 V with  $V_{DD} = 5.0$  V

#### NOTES:

1. High-impedance output state (another device controls bus).
2. Output Load as for MC14597B.



**LATCH TRUTH TABLE**

Strobe	$\overline{\text{Reset}}$	Address Latch	Other Latches
0	1	*	*
1	1	Data	*
X	0	0	0

\* = No change in state of latch

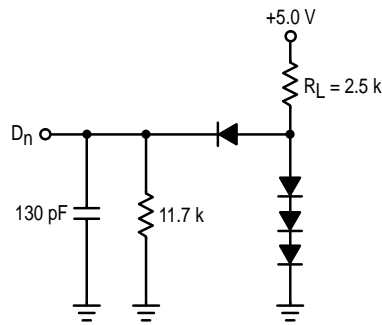
X = Don't care

**TRUTH TABLE FOR MC14597B**

Increment	$\overline{\text{Enable}}$	$\overline{\text{Reset}}$	Address Counter	$\overline{\text{Full}}$
	X	1	Count Up	—
	X	1	No Change	—
X	1	0	Reset to Zero	Set to One
X	0	1	No Change	Set to One
X	1	1	If at ADDRESS 7	To Zero on Falling Edge of STROBE

X = Don't care

**TEST LOAD  
ALL OUTPUTS**



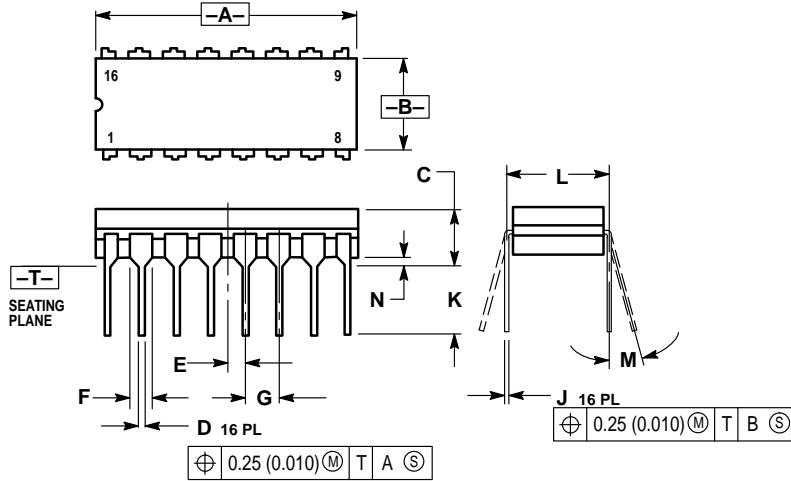
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## OUTLINE DIMENSIONS

### L SUFFIX CERAMIC DIP PACKAGE CASE 620-10 ISSUE V

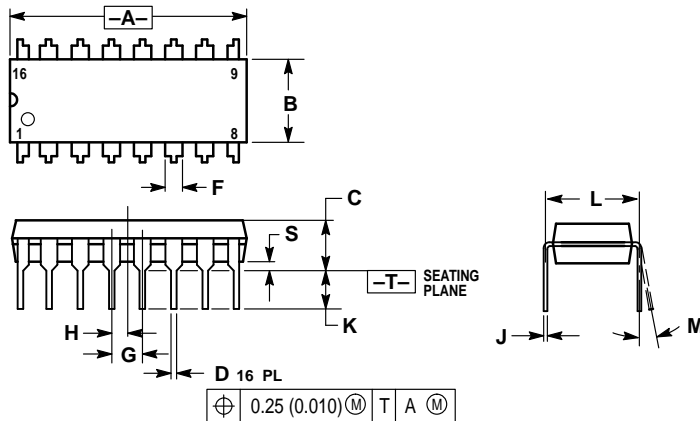


**NOTES:**

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.750	0.785	19.05	19.93
B	0.240	0.295	6.10	7.49
C	—	0.200	—	5.08
D	0.015	0.020	0.39	0.50
E	0.050 BSC		1.27 BSC	
F	0.055	0.065	1.40	1.65
G	0.100 BSC		2.54 BSC	
H	0.008	0.015	0.21	0.38
K	0.125	0.170	3.18	4.31
L	0.300 BSC		7.62 BSC	
M	0°	15°	0°	15°
N	0.020	0.040	0.51	1.01

### P SUFFIX PLASTIC DIP PACKAGE CASE 648-08 ISSUE R



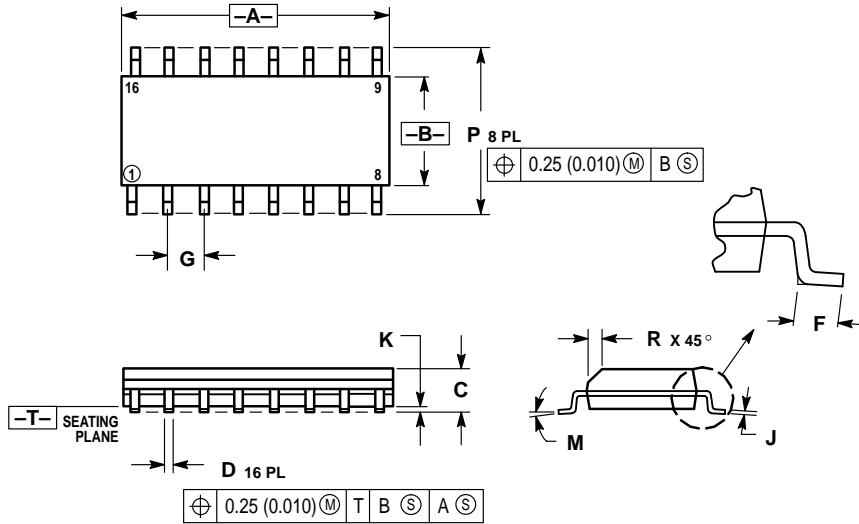
**NOTES:**

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.040	0.70	1.02	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.130	2.80	3.30
L	0.295	0.305	7.50	7.74
M	0°	10°	0°	10°
S	0.020	0.040	0.51	1.01

## OUTLINE DIMENSIONS

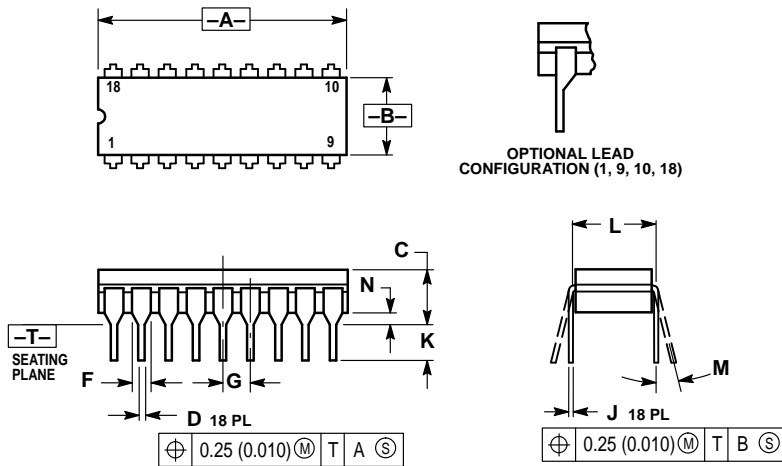
### D SUFFIX PLASTIC SOIC PACKAGE CASE 751B-05 ISSUE J



- 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.

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

### L SUFFIX CERAMIC DIP PACKAGE CASE 726-04 ISSUE G

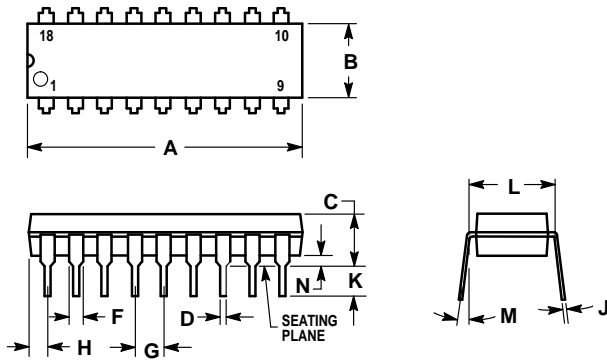


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
  4. DIMENSION F FOR FULL LEADS. HALF LEADS OPTIONAL AT LEAD POSITIONS 1, 9, 10, AND 18.

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



**P SUFFIX  
PLASTIC DIP PACKAGE  
CASE 707-02  
ISSUE C**



- NOTES:
1. POSITIONAL TOLERANCE OF LEADS (D), SHALL BE WITHIN 0.25 (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

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MC14597B/D

