

# ACT FAMILY GENERAL CHARACTERISTICS

## DC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITIONS	Military -55° to 125°C		Commercial -40° to 85°C		UNITS	
			Typ	Guar	Typ	Guar		
$V_{IH}$	Minimum High Level Input Voltage			2.0		2.0	V	
$V_{IL}$	Maximum Low Level Input Voltage			0.8		0.8	V	
$V_{OH}$	Minimum High Level Output Voltage	$V_{CC} = 4.5V$ $V_{IN} = V_{IH}$ or $V_{IL}$	$ I_{OH} $				V	
			20 $\mu A$		4.4			4.4
			24mA		2.4			2.6
$V_{OL}$	Maximum Low Level Output Voltage	$V_{CC} = 4.5V$ $V_{IN} = V_{IH}$ or $V_{IL}$	$ I_{OL} $				V	
			20 $\mu A$		0.1			0.1
			32mA		0.5			0.4
			48mA		0.65			0.5
$V_{IK}$	Input Clamp Voltage	$V_{CC} = 4.5V$	$I_{IN}$				V	
			-18mA		-1.2			-1.2
			18mA		$V_{CC}+1.2$			$V_{CC}+1.2$
$I_L$	Maximum Input Leakage Current	$V_{CC} = 5.5V$ $V_{IN} = V_{CC}$ or Gnd		$\pm 1.0$		$\pm 5.0$	$\mu A$	
$I_{OZ}$	Maximum Output Leakage Current	$V_{CC} = 5.5V$ $V_{OUT} = V_{CC}$ or Gnd All Outputs Disabled	1.0	$\pm 10.0$	0.5	$\pm 5.0$	$\mu A$	
$I_{CC}$	Maximum Quiescent Supply Current	$V_{CC} = 5.5V$ $V_{IN} = V_{CC}$ or Gnd All Outputs Disabled*	10.0	160.0	10.0	120.0	$\mu A$	

\* Outputs floating, except for transceivers which must have outputs tied to  $V_{CC}$  or ground.

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>**

SYMBOL	RATING	COMMERCIAL	MILITARY	UNIT
V <sub>CC</sub>	Supply Voltage	-0.5 to +7.0	-0.5 to +7.0	V
T <sub>A</sub>	Operating Temperature	-40 to +85	-55 to +125	°C
T <sub>STG</sub>	Storage Temperature	-85 to +150	-85 to + 150	°C
I <sub>OUT</sub>	DC Output Current	±50	±50	mA

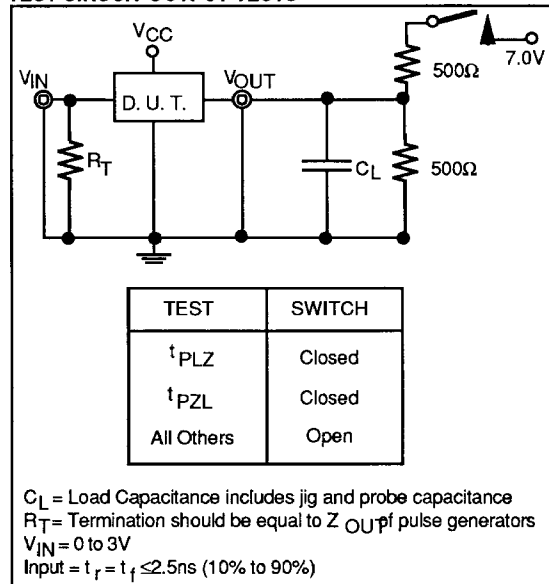
Note 1: Maximum ratings are those values beyond which damage to the device may occur

**RECOMMENDED OPERATING CONDITIONS**

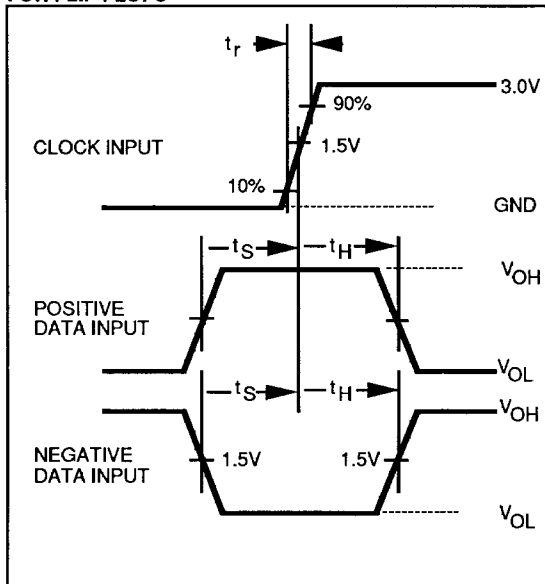
SYMBOL	PARAMETER	Min		Typ		Max		UNIT
		Mil	Comm	Mil	Comm	Mil	Comm	
V <sub>CC</sub>	Supply Voltage	4.5	4.5	5.0	5.0	5.5	5.5	V
T <sub>A</sub>	Operating Free-Air Temp.	-55	-40			125	85	°C
t <sub>r</sub> , t <sub>f</sub>	Input, Rise and Fall Rate dt/dv			3	3	500	500	ns/V
V <sub>IH</sub>	High Level Input Voltage	2.0	2.0			V <sub>CC</sub> +0.5		V
V <sub>IL</sub>	Low Level Input Voltage	-0.5	-0.5			0.8	0.8	V

# ACT FAMILY GENERAL CHARACTERISTICS

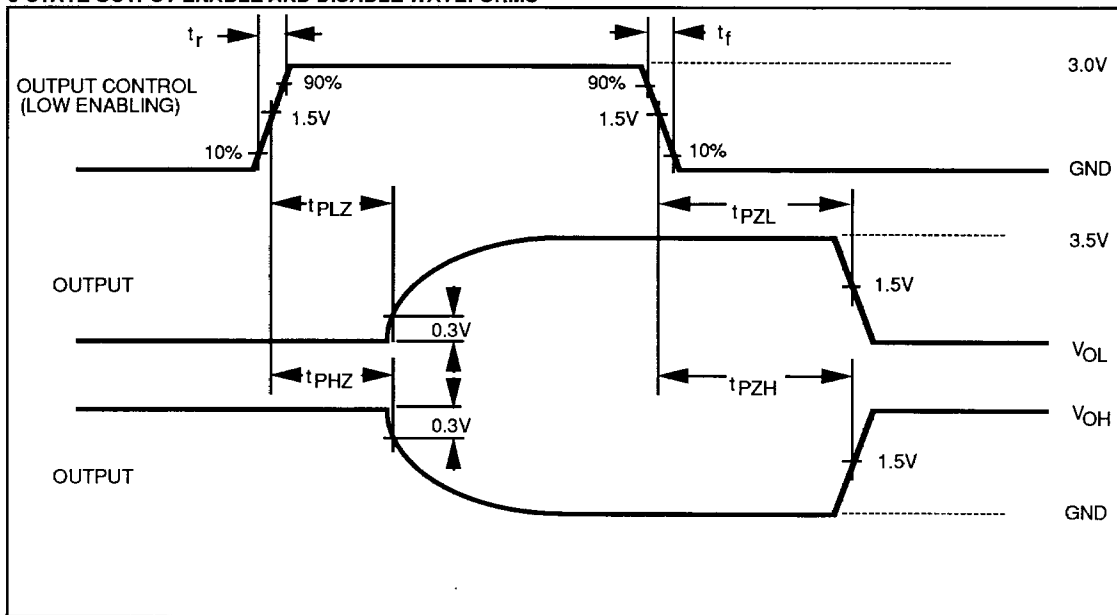
## TEST CIRCUIT OUTPUT TESTS



## SETUP AND HOLD TIME WAVEFORMS FOR FLIP FLOPS

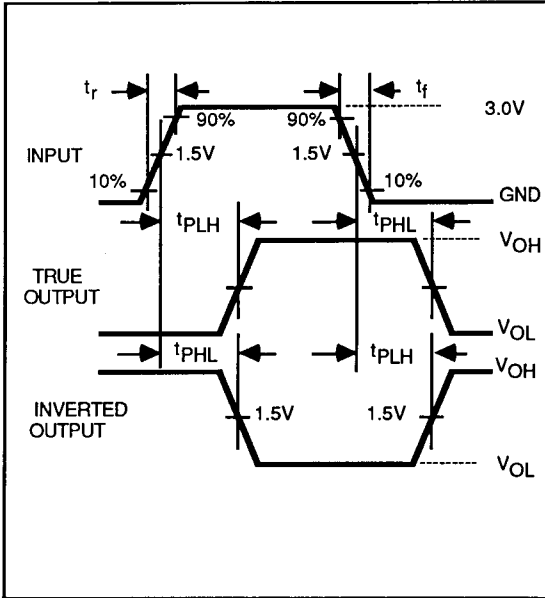


## 3-STATE OUTPUT ENABLE AND DISABLE WAVEFORMS

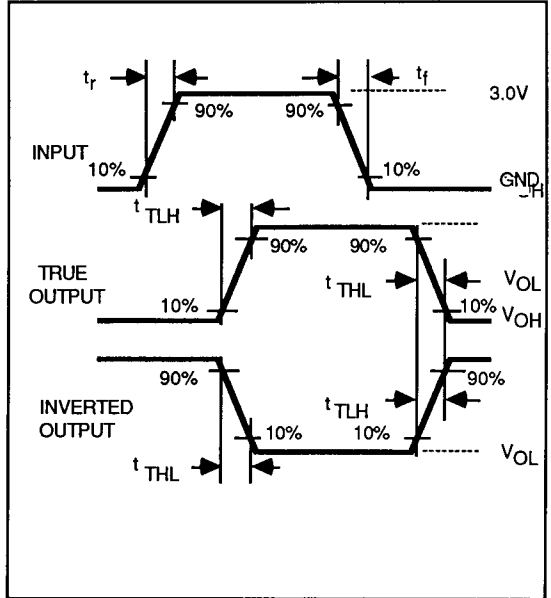


ACT FAMILY  
DATA SHEETS

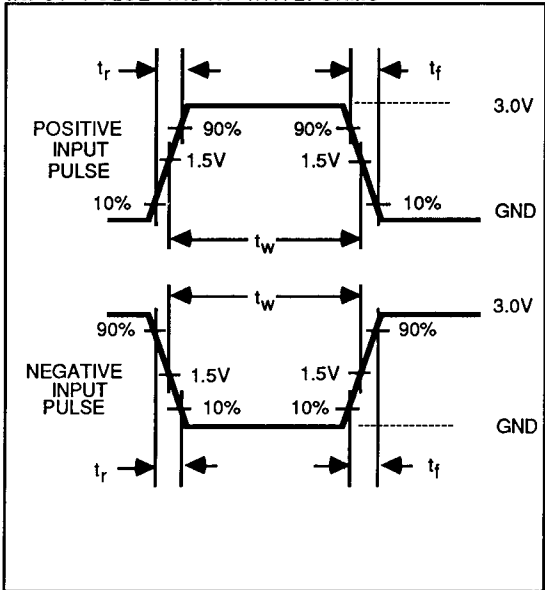
PROPAGATION DELAY WAVEFORMS



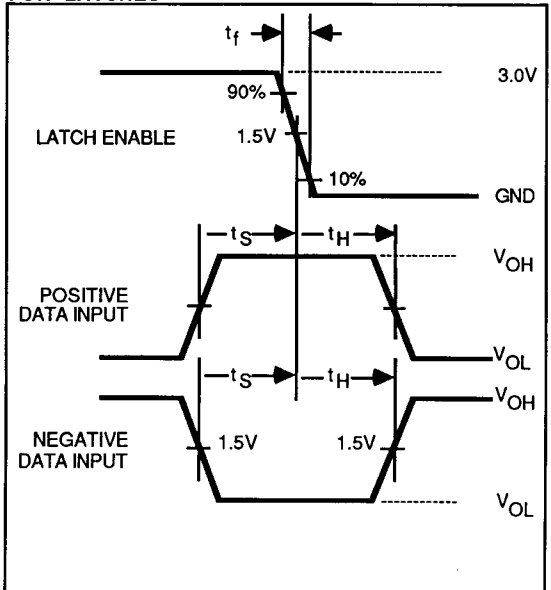
OUTPUT TRANSITION TIME WAVEFORMS  
( 10-90% of 3.0V )



INPUT PULSE WIDTH WAVEFORMS



SETUP AND HOLD TIME WAVEFORMS  
FOR LATCHES



ACT FAMILY  
DATA SHEETS

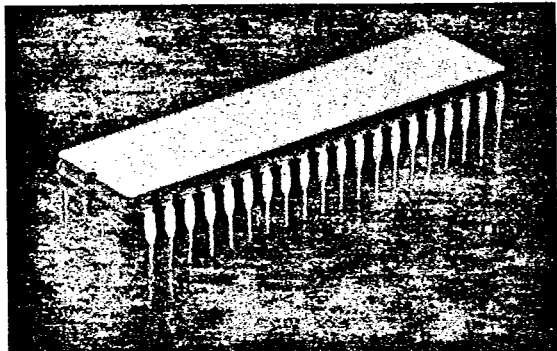
PACKAGING

T-90-20

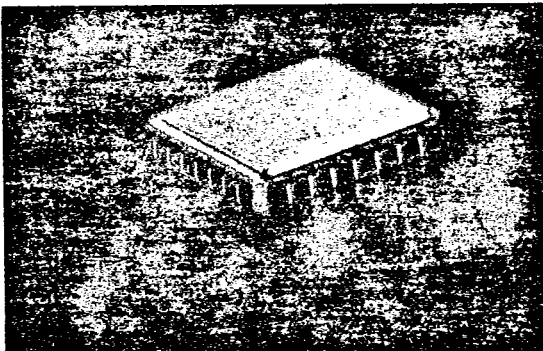
VTC offers a wide variety of industry-standard packages for its products. These include plastic and ceramic dual in-line, side brazed ceramic, plastic small outline, plastic leaded chip carrier, ceramic leadless chip carrier, surface mount plastic, ceramic flatpacks and pin grid array packages.

Pin counts to 172 pins are used in volume manufacturing and pin counts up to 300 are in development.

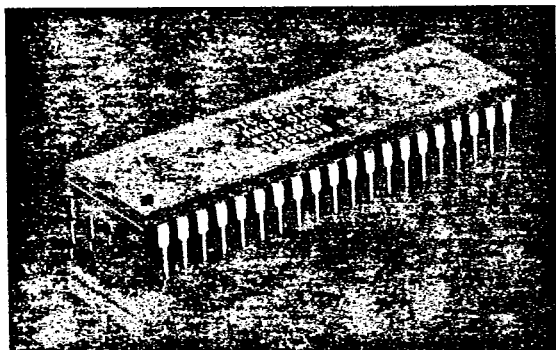
The packages dimensions given in this section are offered for VTC's advanced CMOS logic products. The ACL products are available compliant to MIL-STD-883.



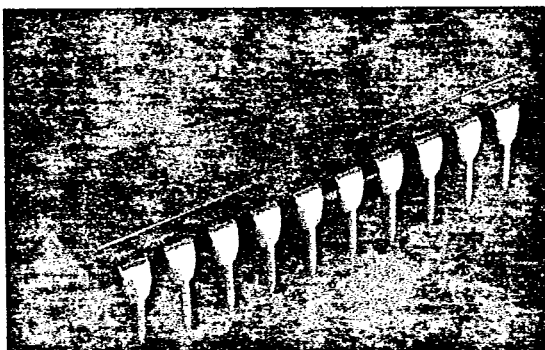
Ceramic DIP (Cerdip)



Ceramic Leadless Chip Carrier (LCC)

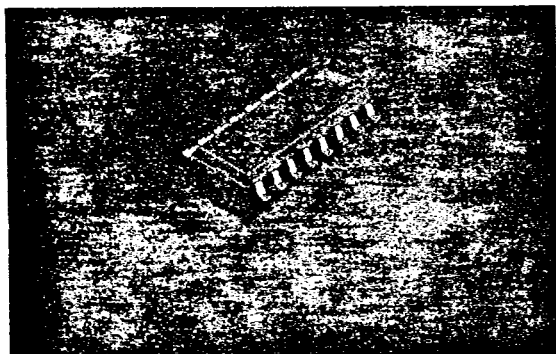


Plastic DIP



Plastic Slimline DIP

PACKAGING AND ORDERING

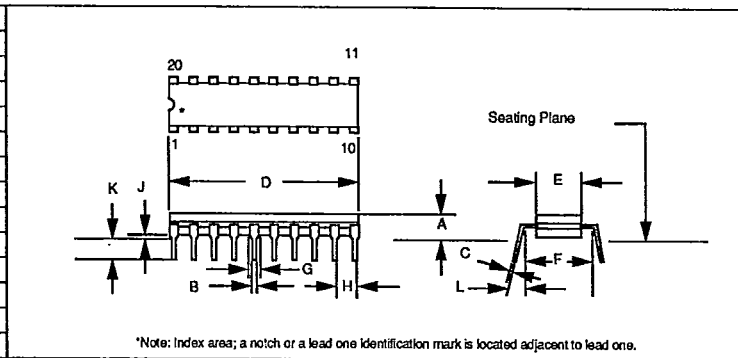


Plastic SOIC

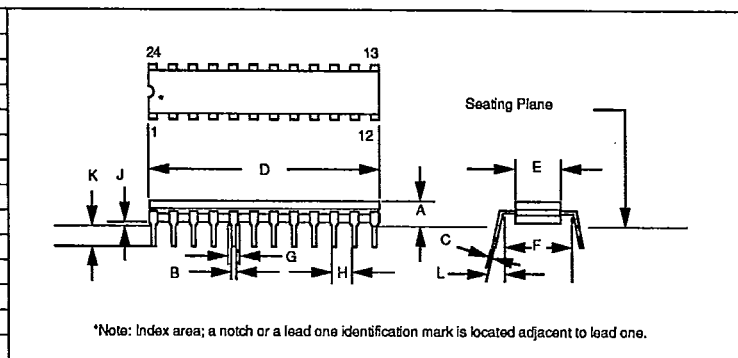
CERAMIC DIP (CERDIP)

T-90-20

20 PIN CERAMIC DIP				
SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.155	0.200	3.94	5.08
B	0.014	0.023	0.36	0.58
C	0.008	0.015	0.20	0.38
D	0.940	0.960	23.87	24.39
E	0.220	0.300	5.59	7.62
F	0.300 BSC		7.62 BSC	
G	0.030	0.070	0.76	1.78
H	0.100 BSC		2.54 BSC	
J	0.015	0.060	0.38	1.52
K	0.125	0.200	3.18	5.08
L	0°	15°	0°	15°



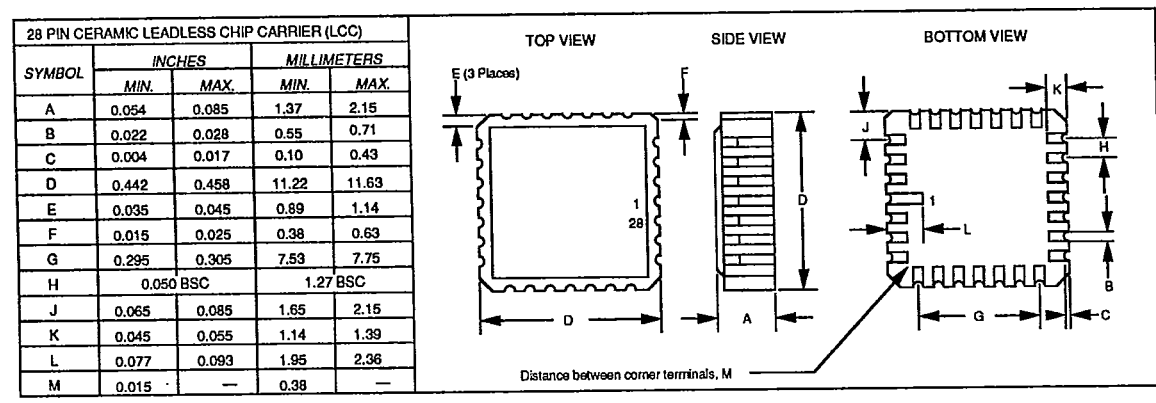
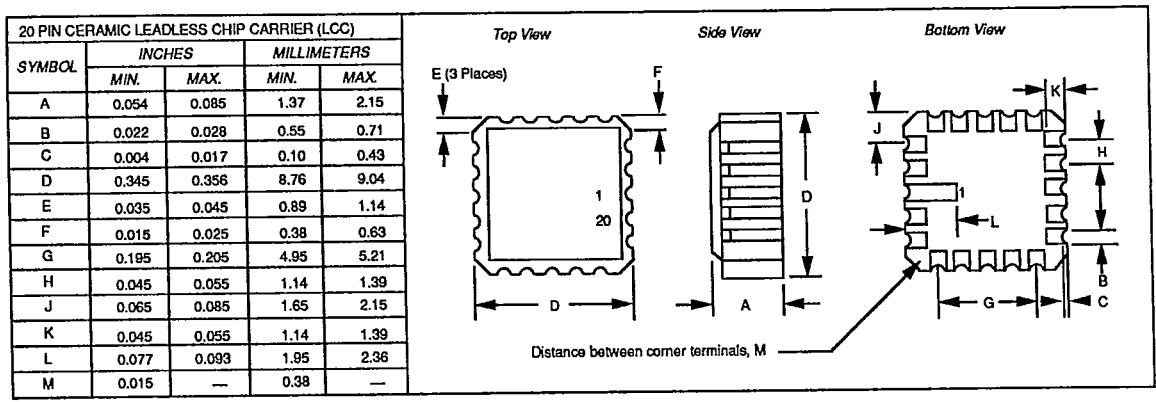
24 PIN CERAMIC DIP				
SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.155	0.200	3.94	5.08
B	0.014	0.023	0.36	0.58
C	0.008	0.015	0.20	0.38
D	1.150	1.350	29.21	34.29
E	0.220	0.300	5.59	7.62
F	0.300 BSC		7.62 BSC	
G	0.030	0.070	0.76	1.78
H	0.100 BSC		2.54 BSC	
J	0.015	0.060	0.38	1.52
K	0.125	0.200	3.18	5.08
L	0°	15°	0°	15°



PACKAGING AND ORDERING

CERAMIC LEADLESS CHIP CARRIER (LCC)

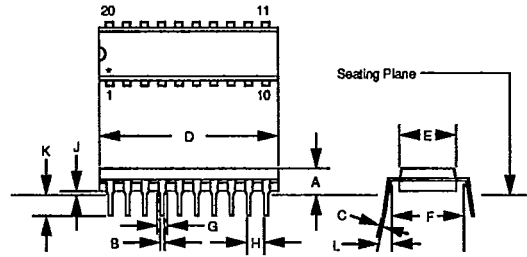
T-90-20



PACKAGING AND ORDERING

T-90 -20

20 PIN PLASTIC DIP				
SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	—	0.210	—	5.33
B	0.014	0.022	0.356	0.558
C	0.008	0.015	0.204	0.381
D	0.925	1.060	23.5	26.9
E	0.240	0.280	6.10	7.11
F	0.300	0.325	7.62	8.25
G	0.045	0.070	1.15	1.77
H	0.100 BSC		2.54 BSC	
J	0.015	—	0.39	—
K	0.115	0.160	2.93	4.06
L	Ø	15°	Ø	15°



\*Note: Index area; a notch or a lead one identification mark is located adjacent to lead one.

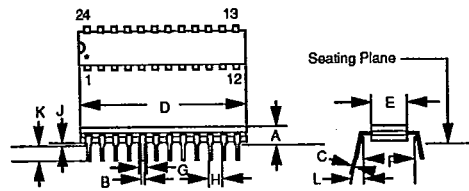
PACKAGING  
AND ORDERING



PLASTIC SLIMLINE DIP

T-90-20

24 PIN 'SLIMLINE' PLASTIC DIP				
SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	—	0.210	—	5.33
B	0.014	0.022	0.356	0.558
C	0.008	0.015	0.204	0.381
D	1.125	1.275	29.3	32.3
E	0.240	0.280	6.10	7.11
F	0.300 BSC		7.62 BSC	
G	0.045	0.070	1.15	1.77
H	0.100 BSC		2.54 BSC	
J	0.015	—	0.39	—
K	0.115	0.160	2.93	4.06
L	0°	15°	0°	15°

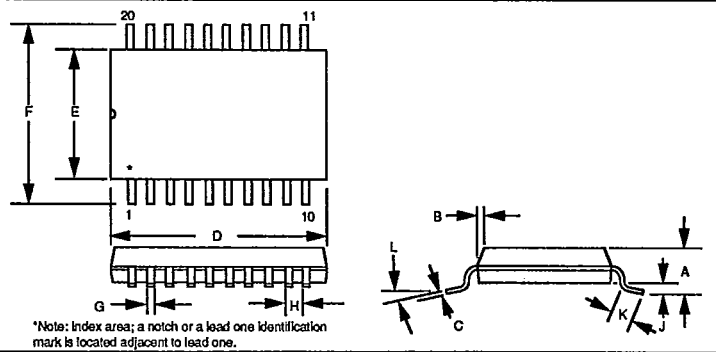


\*Note: Index area; a notch or a lead one identification mark is located adjacent to lead one.

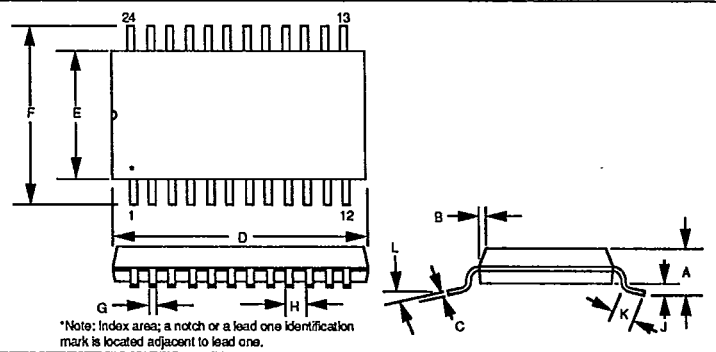
PACKAGING AND ORDERING

T-90-20

20 PIN SOIC				
SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.092	0.110	2.35	2.75
B	0.009	0.030	0.25	0.75
C	0.007	0.013	0.18	0.32
D	0.496	0.512	12.60	13.00
E	0.291	0.300	7.40	7.60
F	0.393	0.420	10.00	10.65
G	0.013	0.020	0.35	0.49
H	0.050 BSC		1.27 BSC	
J	0.003	0.012	0.10	0.30
K	0.015	0.050	0.40	1.27
L	Ø	Ø	Ø	Ø



24 PIN SOIC				
SYMBOL	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.092	0.110	2.35	2.75
B	0.009	0.030	0.25	0.75
C	0.007	0.013	0.18	0.32
D	0.598	0.615	15.20	15.62
E	0.291	0.300	7.40	7.60
F	0.393	0.420	10.00	10.65
G	0.013	0.020	0.35	0.49
H	0.050 BSC		1.27 BSC	
J	0.003	0.012	0.10	0.30
K	0.015	0.050	0.40	1.27
L	Ø	Ø	Ø	Ø



PACKAGING AND ORDERING