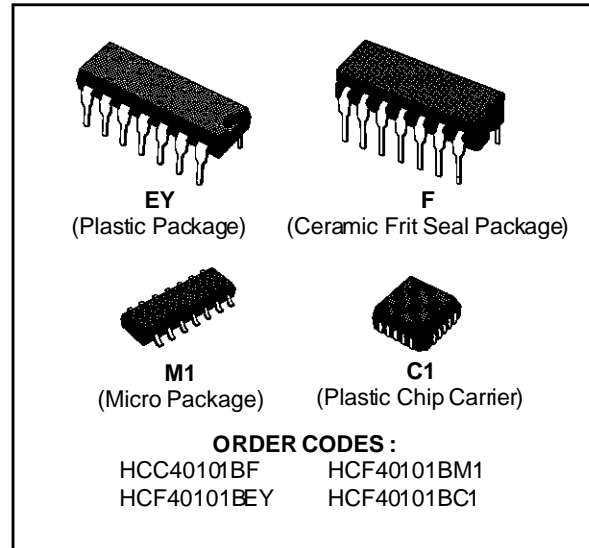


**9-BIT PARITY GENERATOR/CHECKER**

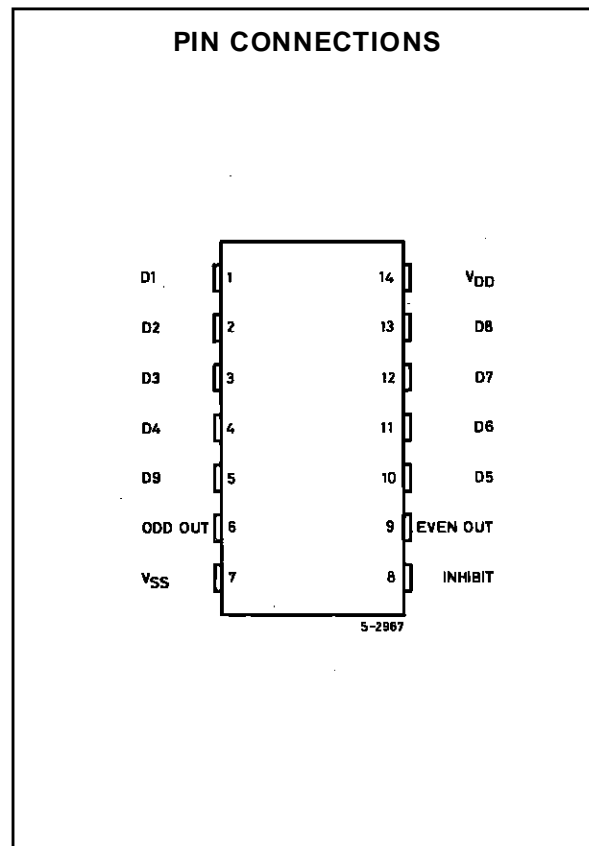
- STANDARDIZED SYMMETRICAL OUTPUT CHARACTERISTICS
- QUIESCENT CURRENT SPECIFIED AT 20V FOR HCC DEVICE
- 5V, 10V, AND 15V PARAMETRIC RATINGS
- INPUT CURRENT OF 100nA AT 18V AND 25°C FOR HCC DEVICE
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC TENTATIVE STANDARD N° 13A, "STANDARD SPECIFICATIONS FOR DESCRIPTION OF "B" SERIES CMOS DEVICES"



**DESCRIPTION**

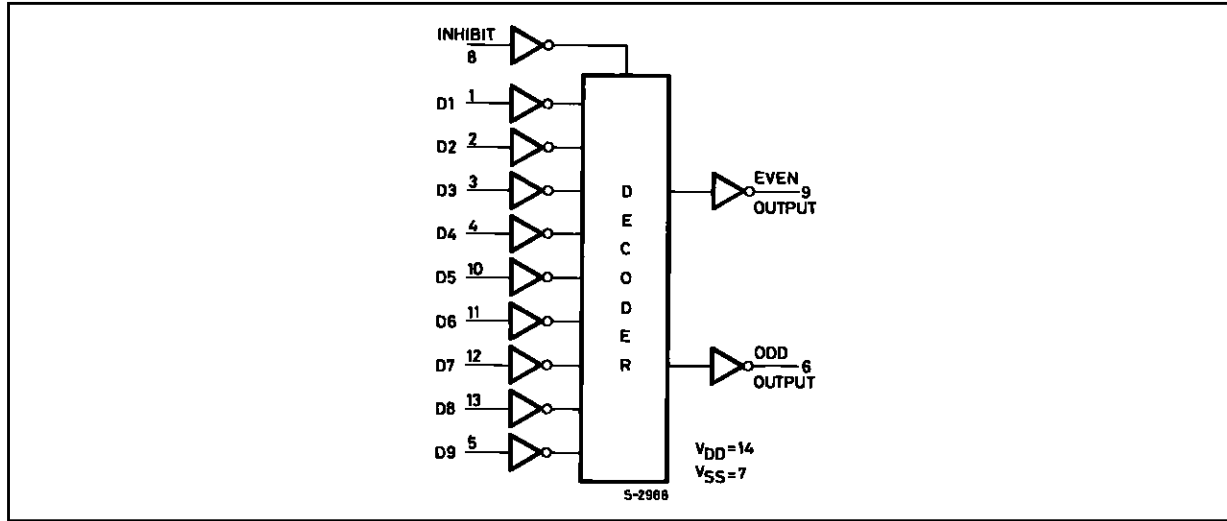
The **HCC40101B** (extended temperature range) and **HCF40101B** (intermediate temperature range) are monolithic integrated circuits, available in 14-lead dual in-line plastic or ceramic package and plastic micro package.

The **HCC/HCF40101B** is a 9-bit (8 data bits plus 1 parity bit) parity generator/checker. It may be used to detect errors in data transmission or data retrieval. Odd and even outputs facilitate odd or even parity generation and checking. When used as a parity generator, a parity bit is supplied along with the data to generate an even or odd parity output. When used as a parity checker, the received data bits and parity bits are compared for correct parity. The even or odd outputs are used to indicate an error in the received data. Word-length capability is expandable by cascading. The **HCC/HCF40101B** is also provided with an inhibit control. If the inhibit control is set at logical "1", the even and odd outputs go to a logical "0".



# HCC/HCF40101B

## FUNCTIONAL DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

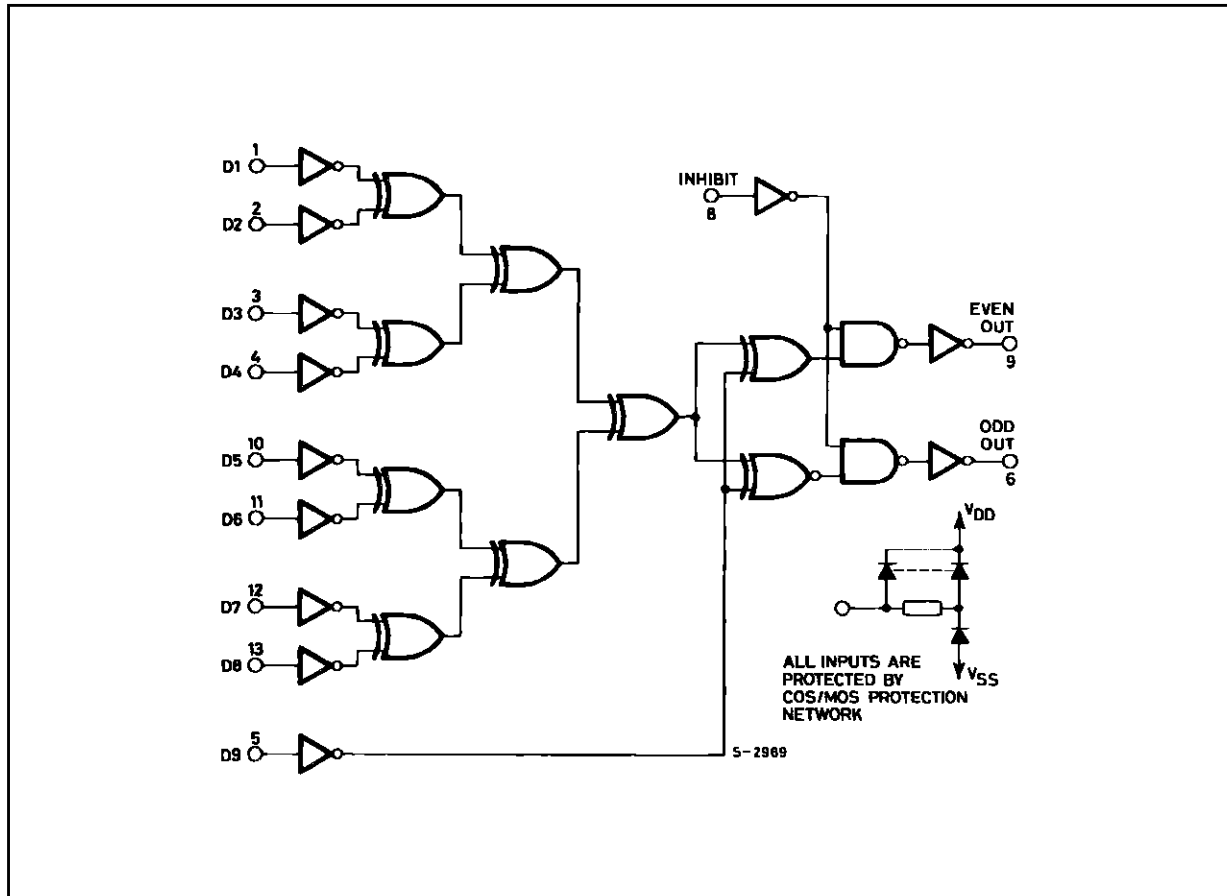
Symbol	Parameter	Value	Unit
$V_{DD}^*$	Supply Voltage : <b>HCC</b> Types <b>HCF</b> Types	- 0.5 to + 20	V
		- 0.5 to + 18	V
$V_i$	Input Voltage	- 0.5 to $V_{DD} + 0.5$	V
$I_i$	DC Input Current (any one input)	$\pm 10$	mA
$P_{tot}$	Total Power Dissipation (per package) Dissipation per Output Transistor for $T_{op}$ = Full Package-temperature Range	200	mW
		100	mW
$T_{op}$	Operating Temperature : <b>HCC</b> Types <b>HCF</b> Types	- 55 to + 125	$^{\circ}C$
		- 40 to + 85	$^{\circ}C$
$T_{stg}$	Storage Temperature	- 65 to + 150	$^{\circ}C$

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for external periods may affect device reliability.  
\* All voltages are with respect to  $V_{SS}$  (GND).

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
$V_{DD}$	Supply Voltage : <b>HCC</b> Types <b>HCF</b> Types	3 to 18	V
		3 to 15	V
$V_i$	Input Voltage	0 to $V_{DD}$	V
$T_{op}$	Operating Temperature : <b>HCC</b> Types <b>HCF</b> Types	- 55 to + 125	$^{\circ}C$
		- 40 to + 85	$^{\circ}C$

## LOGIC DIAGRAM



## TRUTH TABLE

Inputs		Outputs	
D1-D9	Inhibit	Even	Odd
$\Sigma$ 1's = Even	0	1	0
$\Sigma$ 1's = Odd	0	0	1
X	1	0	0

X = Don't Care  
 Logic 1 = High  
 Logic 0 = Low.

# HCC/HCF40101B

## STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

Symbol	Parameter		Test Conditions				Value						Unit	
			V <sub>I</sub> (V)	V <sub>O</sub> (V)	I <sub>O</sub>   ( $\mu$ A)	V <sub>DD</sub> (V)	T <sub>Low</sub> *		25°C			T <sub>High</sub> *		
							Min.	Max.	Min.	Typ.	Max.	Min.		Max.
I <sub>L</sub>	Quiescent Current	HCC Types	0/ 5			5		5		0.04	5		150	$\mu$ A
			0/10			10		10		0.04	10		300	
			0/15			15		20		0.04	20		600	
			0/20			20		100		0.08	100		3000	
		HCF Types	0/ 5			5		20		0.04	20		150	
			0/10			10		40		0.04	40		300	
V <sub>OH</sub>	Output High Voltage		0/ 5		< 1	5	4.95		4.95		4.95		V	
			0/10		< 1	10	9.95		9.95		9.95			
			0/15		< 1	15	14.95		14.95		14.95			
V <sub>OL</sub>	Output Low Voltage		5/0		< 1	5		0.05		0.05		0.05	V	
			10/0		< 1	10		0.05		0.05		0.05		
			15/0		< 1	15		0.05		0.05		0.05		
V <sub>IH</sub>	Input High Voltage			0.5/4.5	< 1	5	3.5		3.5		3.5		V	
				1/9	< 1	10	7		7		7			
				1.5/13.5	< 1	15	11		11		11			
V <sub>IL</sub>	Input Low Voltage			4.5/0.5	< 1	5		1.5		1.5		1.5	V	
				9/1	< 1	10		3		3		3		
				13.5/1.5	< 1	15		4		4		4		
I <sub>OH</sub>	Output Drive Current	HCC Types	0/ 5	2.5		5	- 2		- 1.6	- 3.2		- 1.15	mA	
			0/ 5	4.6		5	- 0.64		- 0.51	- 1		- 0.36		
			0/10	9.5		10	- 1.6		- 1.3	- 2.6		- 0.9		
			0/15	13.5		15	- 4.2		- 3.4	- 6.8		- 2.4		
		HCF Types	0/ 5	2.5		5	- 1.53		- 1.36	- 3.2		- 1.1		
			0/ 5	4.6		5	- 0.52		- 0.44	- 1		- 0.36		
I <sub>OL</sub>	Output Sink Current	HCC Types	0/ 5	0.4		5	0.64		0.51	1		0.36	mA	
			0/10	0.5		10	1.6		1.3	2.6		0.9		
			0/15	1.5		15	4.2		3.4	6.8		2.4		
		HCF Types	0/ 5	0.4		5	0.52		0.44	1		0.36		
			0/10	0.5		10	1.3		1.1	2.6		0.9		
			0/15	1.5		15	3.6		3.0	6.8		2.4		
I <sub>IH</sub> , I <sub>IL</sub>	Input Leakage Current	HCC Types	0/18	Any Input		18		$\pm$ 0.1		$\pm$ 10 <sup>-5</sup>	$\pm$ 0.1		$\pm$ 1	$\mu$ A
		HCF Types	0/15	Any Input		15		$\pm$ 0.3		$\pm$ 10 <sup>-5</sup>	$\pm$ 0.3		$\pm$ 1	
C <sub>I</sub>	Input Capacitance		Any Input						5	7.5			pF	

\* T<sub>Low</sub> = - 55°C for HCC device : - 40°C for HCF device.

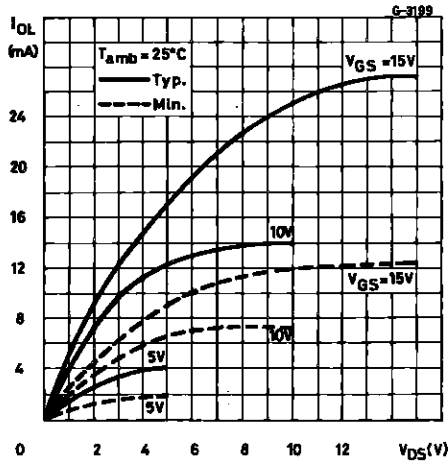
\* T<sub>High</sub> = + 125°C for HCC device : + 85°C for HCF device.

The Noise Margin for both "1" and "0" level is : 1V min. with V<sub>DD</sub> = 5V, 2V min. with V<sub>DD</sub> = 10V, 2.5V min. with V<sub>DD</sub> = 15V.

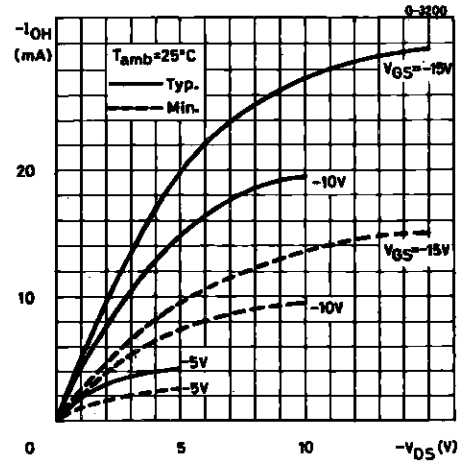
**DYNAMIC ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}\text{C}$ ,  $C_L = 50\text{pF}$ ,  $R_L = 200\text{k}\Omega$ , typical temperature coefficient for all  $V_{DD}$  values is  $0.3\%/^{\circ}\text{C}$ , all input rise and fall time = 20ns)

Symbol	Parameter	Test Conditions		Value			Unit
			$V_{DD}$ (V)	Min.	Typ.	Max.	
$t_{PLH}$ , $t_{PHL}$	Propagation Delay Time		5		350	700	ns
			10		150	300	
			15		100	200	
$t_{PLH}$ , $t_{PHL}$	Propagation Delay Time Inhibit to Output		5		140	280	ns
			10		70	140	
			15		50	100	
$t_{TLH}$ , $t_{THL}$	Transition Time		5		100	200	ns
			10		50	100	
			15		40	80	

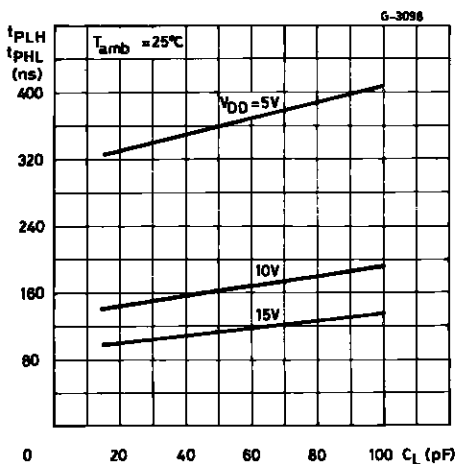
Output Low (sink) Current Characteristics.



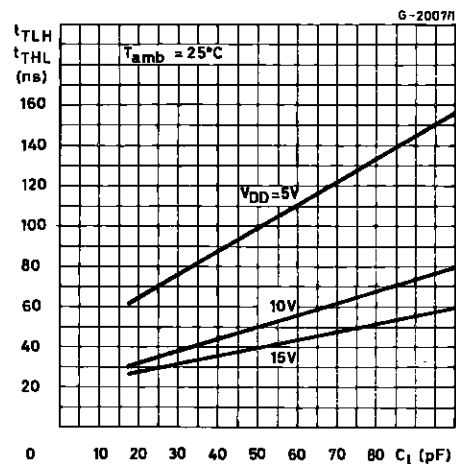
Output High (source) Current Characteristics.



Typical Propagation Delay Time vs. Load Capacitance.

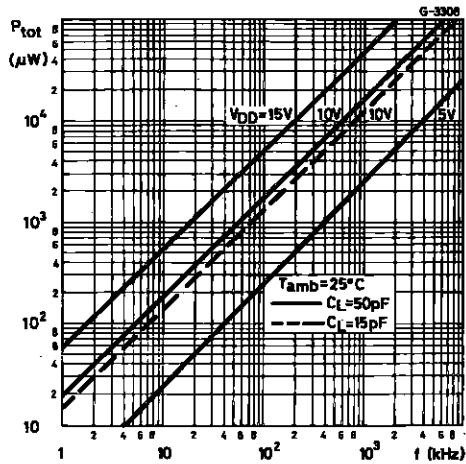


Typical Transition Time vs. Load Capacitance.



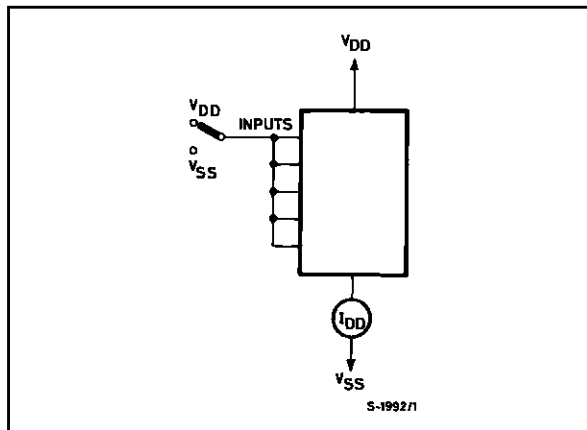
# HCC/HCF40101B

Typical Dynamic power Dissipation vs. Input Frequency.

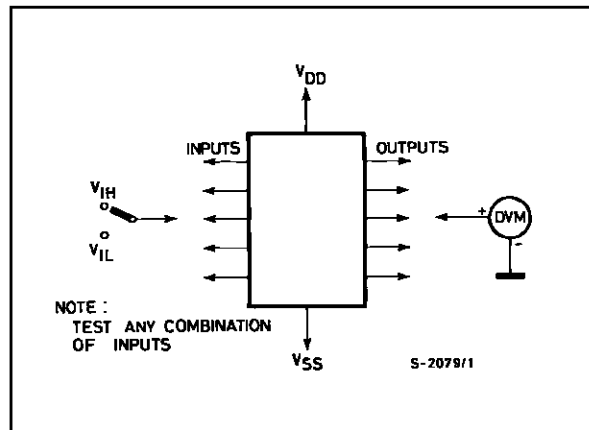


## TEST CIRCUITS

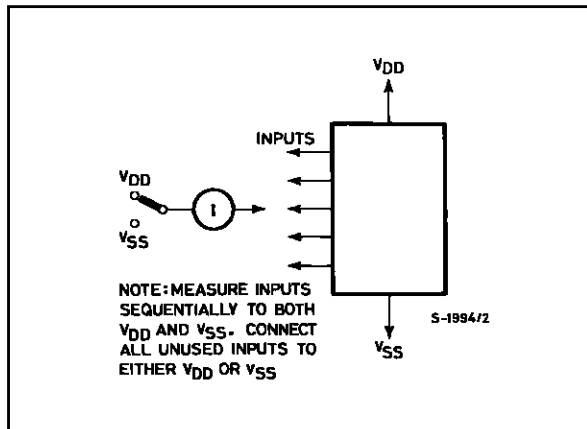
Quiescent Device Current



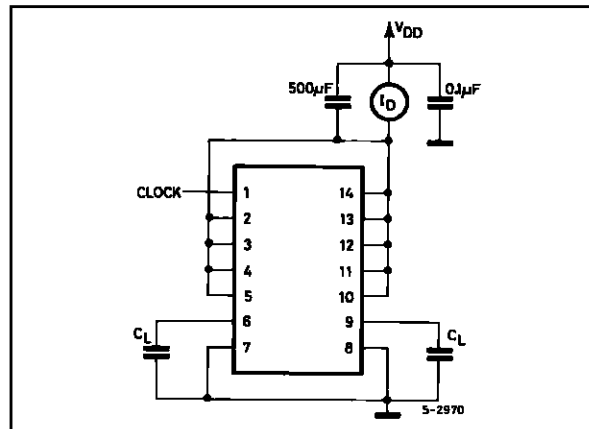
Input Voltage



Input Leakage Current



Dynamic Power Dissipation



**Plastic DIP14 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	1.39		1.65	0.055		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		15.24			0.600	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z	1.27		2.54	0.050		0.100



**Ceramic DIP14/1 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			20			0.787
B			7.0			0.276
D		3.3			0.130	
E	0.38			0.015		
e3		15.24			0.600	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
H	1.17		1.52	0.046		0.060
L	0.22		0.31	0.009		0.012
M	1.52		2.54	0.060		0.100
N			10.3			0.406
P	7.8		8.05	0.307		0.317
Q			5.08			0.200



P053C



## SO14 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.003		0.007
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.68			0.026
S	8° (max.)					



**PLCC20 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	9.78		10.03	0.385		0.395
B	8.89		9.04	0.350		0.356
D	4.2		4.57	0.165		0.180
d1		2.54			0.100	
d2		0.56			0.022	
E	7.37		8.38	0.290		0.330
e		1.27			0.050	
e3		5.08			0.200	
F		0.38			0.015	
G			0.101			0.004
M		1.27			0.050	
M1		1.14			0.045	



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -  
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A