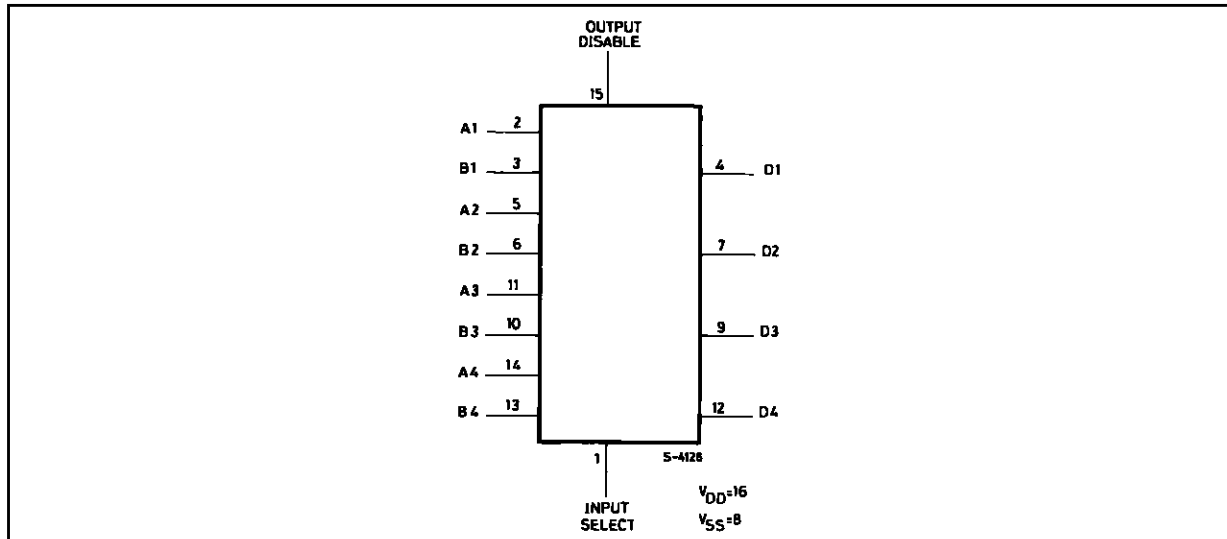


HCC/HCF40257B

FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS

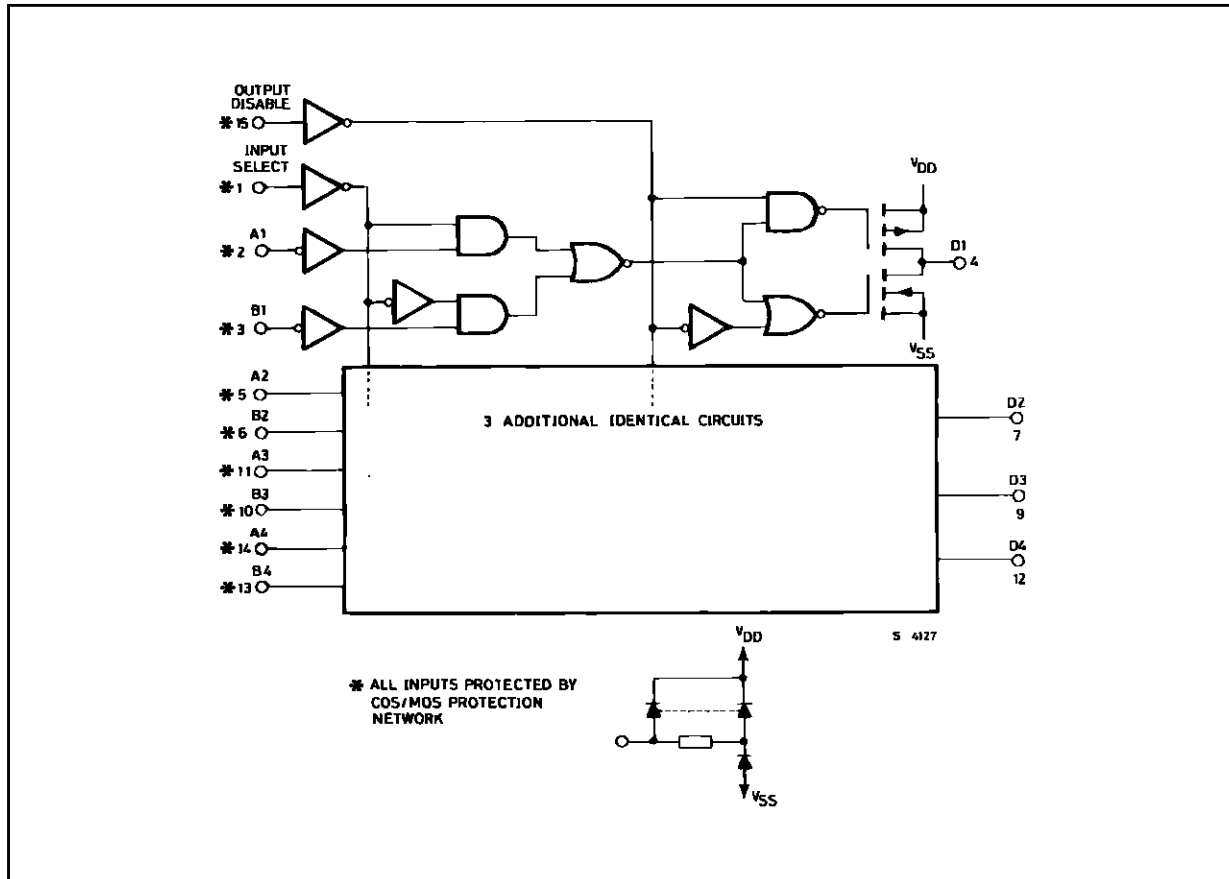
Symbol	Parameter	Value	Unit
V_{DD}^*	Supply Voltage : HCC Types HCF Types	- 0.5 to + 20 - 0.5 to + 18	V V
V_i	Input Voltage	- 0.5 to $V_{DD} + 0.5$	V
I_I	DC Input Current (any one input)	± 10	mA
P_{tot}	Total Power Dissipation (per package)	200	mW
	Dissipation per Output Transistor for T_{op} = Full Package-temperature Range	100	mW
T_{op}	Operating Temperature : HCC Types HCF 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 extended 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 : HCC Types HCF Types	3 to 18	V
		3 to 15	V
V_I	Input Voltage	0 to V_{DD}	V
T_{op}	Operating Temperature : HCC Types HCF Types	- 55 to + 125	$^{\circ}$ C
		- 40 to + 85	$^{\circ}$ C

LOGIC DIAGRAM



TRUTH TABLE

Inputs				Output
3-State Output Disable	Select	A	B	D
1	X	X	X	Z
0	0	0	X	0
0	0	1	X	1
0	1	X	0	0
0	1	X	1	1

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

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STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

Symbol	Parameter		Test Conditions				Value						Unit	
			V _I (V)	V _O (V)	I _O (μ A)	V _{DD} (V)	T _{Low} *		25°C			T _{High} *		
							Min.	Max.	Min.	Typ.	Max.	Min.		Max.
I _L	Quiescent Current	HCC Types	0/ 5			5		1		0.02	1		30	
			0/10			10		2		0.02	2		60	
			0/15			15		4		0.02	4		120	
		HCF Types	0/20			20		20		0.04	20		600	
			0/ 5			5		4		0.02	4		30	
			0/10			10		8		0.02	8		60	
			0/15			15		16		0.02	16		120	
V _{OH}	Output High Voltage		0/ 5		< 1	5	4.95		4.95			4.95		
			0/10		< 1	10	9.95		9.95			9.95		
			0/15		< 1	15	14.95		14.95			14.95		
V _{OL}	Output Low Voltage		5/10		< 1	5		0.05			0.05		0.05	
			10/0		< 1	10		0.05			0.05		0.05	
			15/0		< 1	15		0.05			0.05		0.05	
V _{IH}	Input High Voltage			0.5/4.5	< 1	5	3.5		3.5			3.5		
				1/9	< 1	10	7		7			7		
				1.5/13.5	< 1	15	11		11			11		
V _{IL}	Input Low Voltage			4.5/0.5	< 1	5		1.5			1.5		1.5	
				9/1	< 1	10		3			3		3	
				13.5/1.5	< 1	15		4			4		4	
I _{OH}	Output Drive Current	HCC Types	0/ 5	2.5		5	- 2		- 1.6	- 3.2		- 1.15		
			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		
		HCF Types	0/15	13.5		15	- 4.2		- 3.4	- 6.8		- 2.4		
			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		
	0/10	9.5		10	- 1.3		- 1.1	- 2.6		- 0.9				
	0/15	13.5		15	- 3.6		- 3.0	- 6.8		- 2.4				
I _{OL}	Output Sink Current	HCC Types	0/ 5	0.4		5	0.64		0.51	1		0.36		
			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 _{IH} , I _{IL}	Input Leakage Current	HCC Types	0/18	Any Input		18		\pm 0.1		\pm 10 ⁻⁵	\pm 0.1		\pm 1	
		HCF Types	0/15	Any Input		15		\pm 0.3		\pm 10 ⁻⁵	\pm 0.3		\pm 1	
I _{OH} , I _{OL} **	3-State Output Leakage Current	HCC Types	0/18	0/18		18		\pm 0.4		\pm 10 ⁻⁴	\pm 0.4		\pm 12	
		HCF Types	0/18	0/18		18		\pm 1.0		\pm 10 ⁻⁴	\pm 1.0		7.5	
C _I	Input Capacitance		Any Input						5	7.5			pF	

* T_{Low} = - 55°C for HCC device : - 40°C for HCF device.

* T_{High} = + 125°C for HCC device : + 85°C for HCF device.

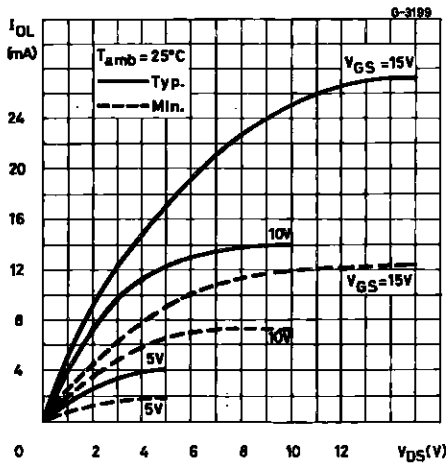
The Noise Margin for both "1" and "0" level is : 1V min. with V_{DD} = 5V, 2V min. with V_{DD} = 10V, 2.5V min. with V_{DD} = 15V.

** Forced output disable.

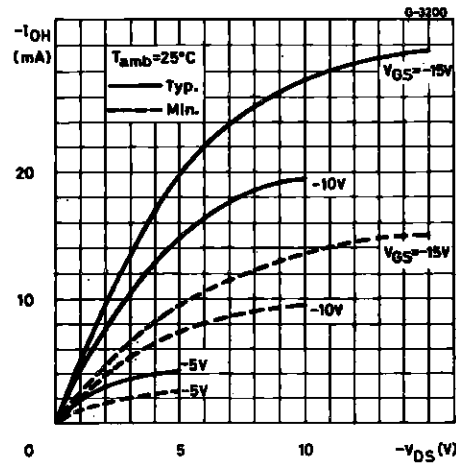
DYNAMIC ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, $C_L = 50\text{pF}$, $R_L = 200\text{k}\Omega$, typical temperature coefficient for all V_{DD} values is $0.3\%/^{\circ}\text{C}$, all input rise and fall time = 20ns)

Symbol	Parameter	Test Conditions		Value			Unit
			V_{DD} (V)	Min.	Typ.	Max.	
t_{PLH} , t_{PHL}	Propagation Delay Time Data Input to Output		5		150	300	ns
			10		70	140	
			15		50	100	
	Select to Output		5		190	380	ns
			10		85	170	
			15		65	130	
	Output Disable to Output		5		95	190	ns
			10		50	100	
			15		40	80	
t_{THL} t_{TLH}	Transition Time		5		100	200	ns
			10		50	100	
			15		40	80	

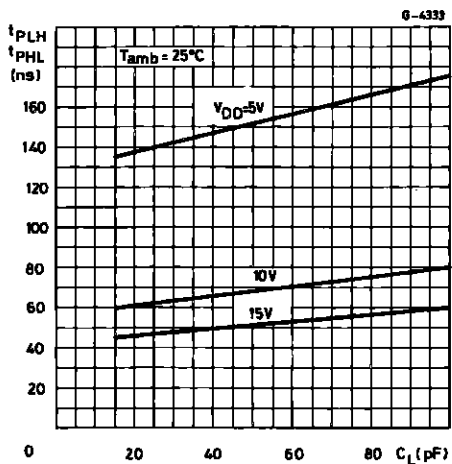
Output Low (sink) Current Characteristics.



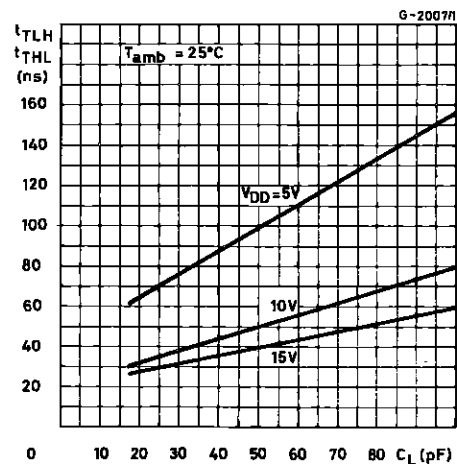
Output High (source) Current Characteristics.



Typical Propagation Delay Time vs. Load Capacitance (Data Input to Output).

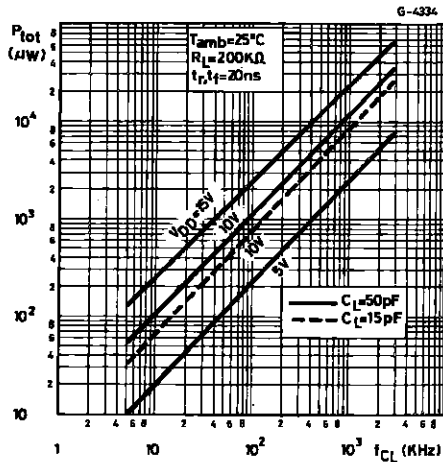


Typical Transition Time vs. Load Capacitance.



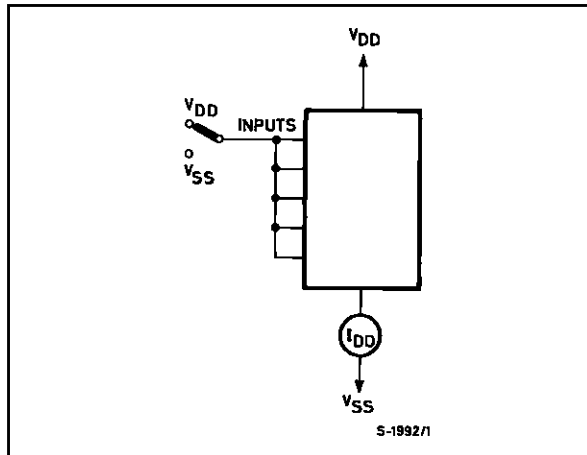
HCC/HCF40257B

Typical Dynamic Power Dissipation vs. Input Frequency (one input to one output).

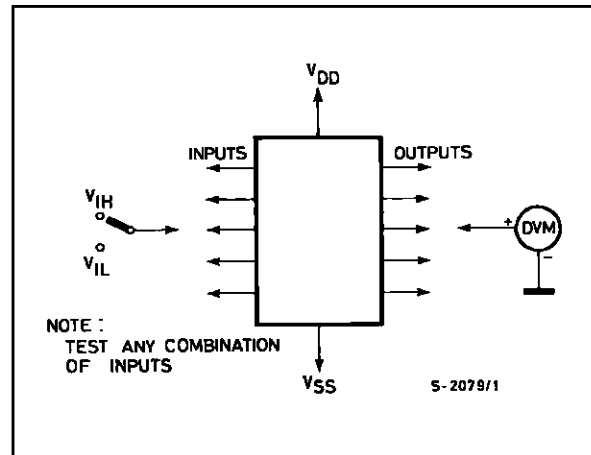


TEST CIRCUITS

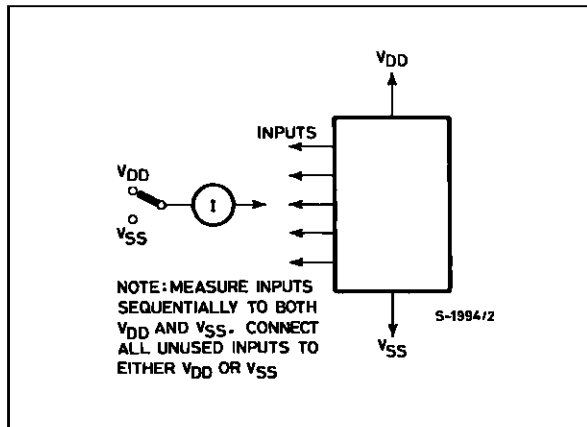
Quiescent Device Current



Input Voltage

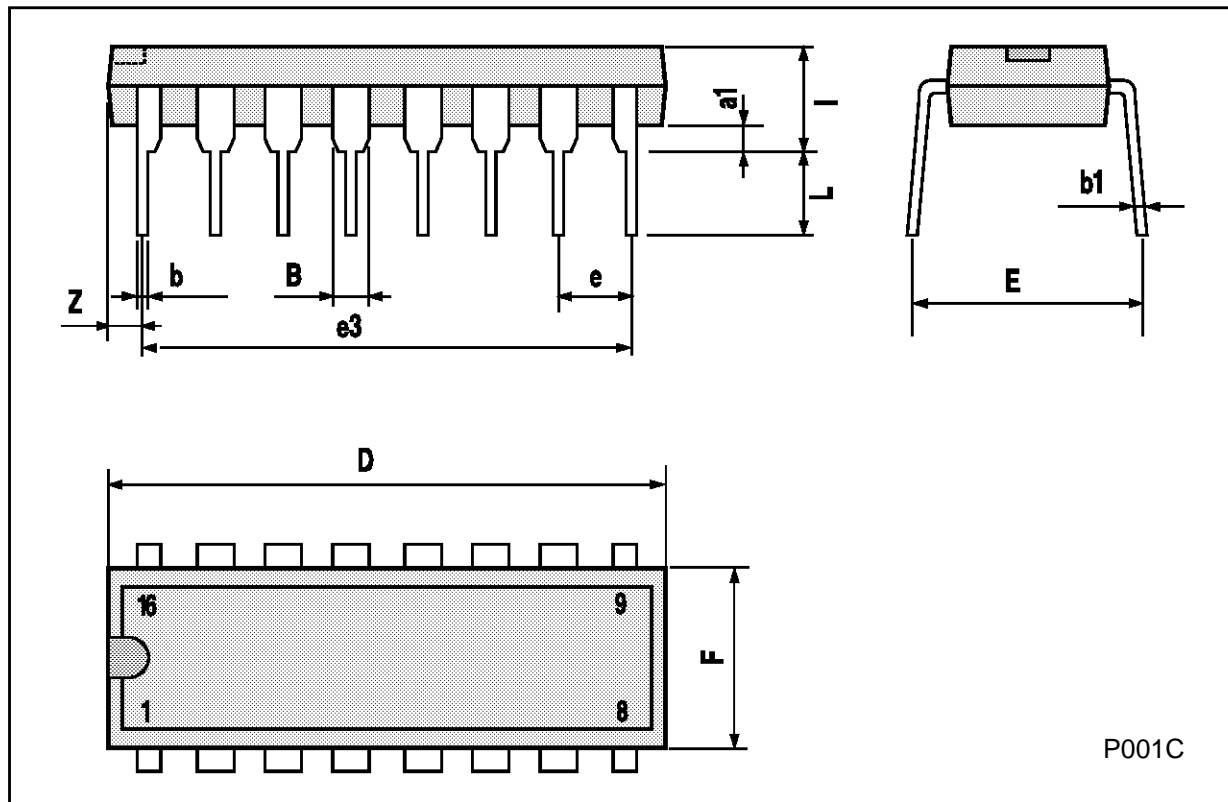


Input Leakage Current



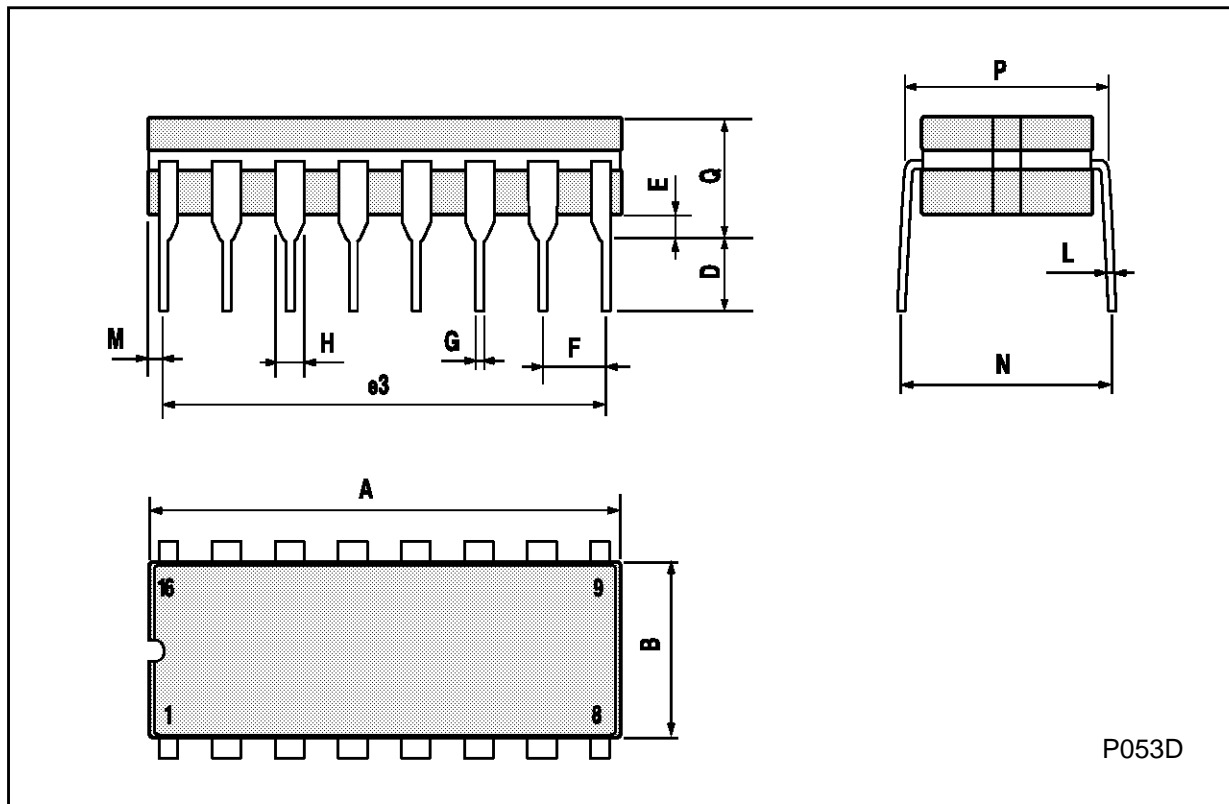
Plastic DIP16 (0.25) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		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		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



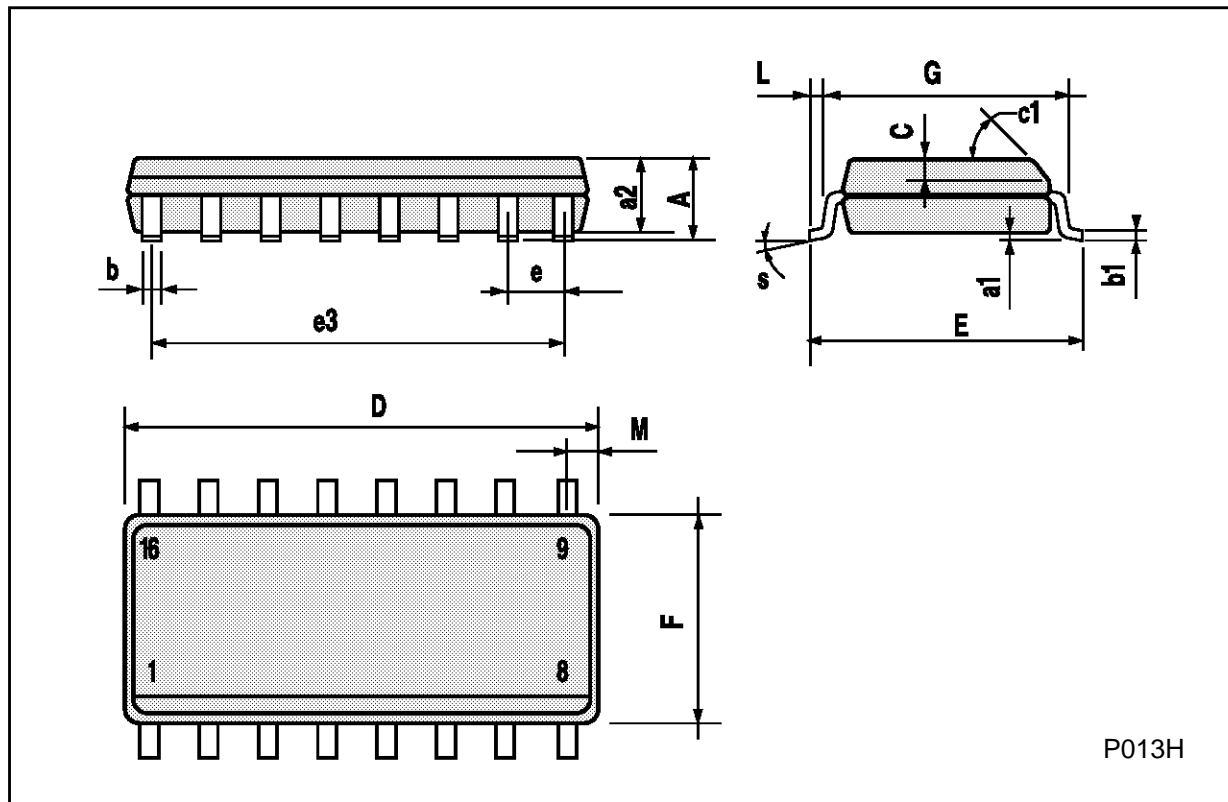
Ceramic DIP16/1 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			20			0.787
B			7			0.276
D		3.3			0.130	
E	0.38			0.015		
e3		17.78			0.700	
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	0.51		1.27	0.020		0.050
N			10.3			0.406
P	7.8		8.05	0.307		0.317
Q			5.08			0.200



SO16 (Narrow) MECHANICAL DATA

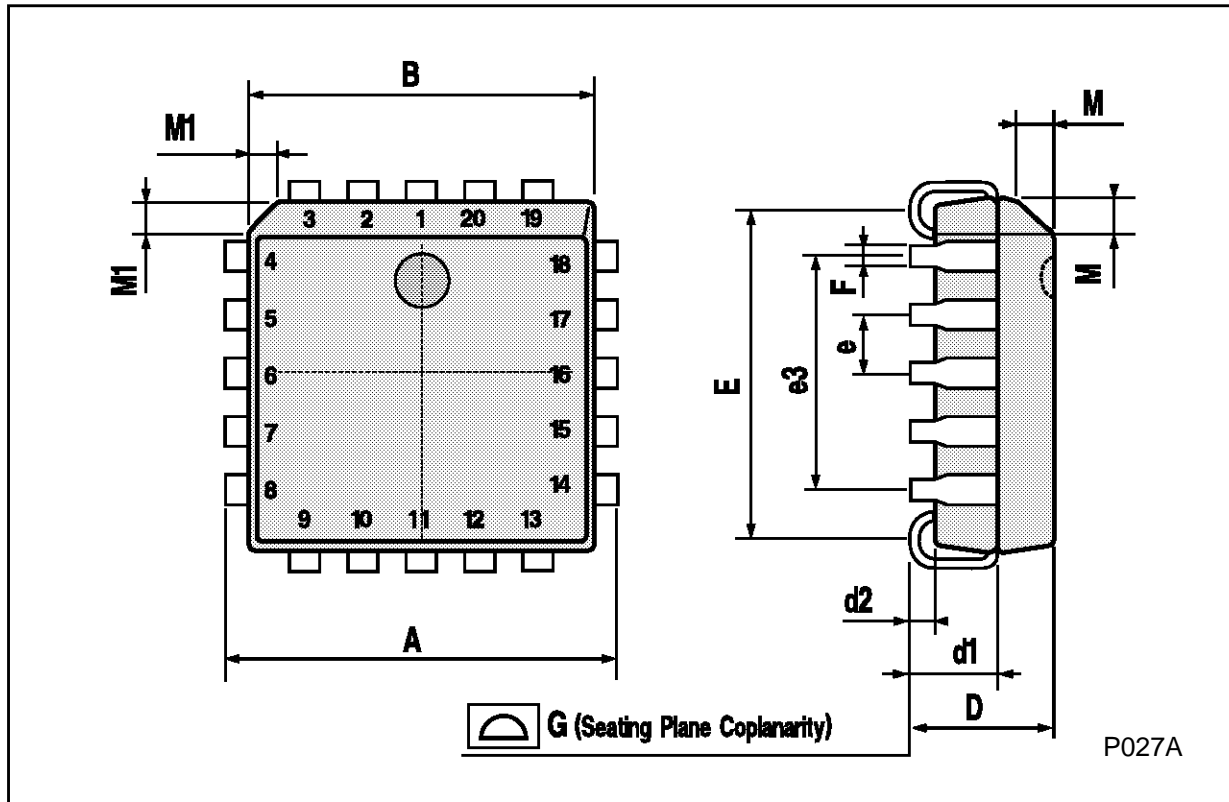
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.004		0.007
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	9.8		10	0.385		0.393
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.62			0.024
S	8° (max.)					



P013H

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	



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