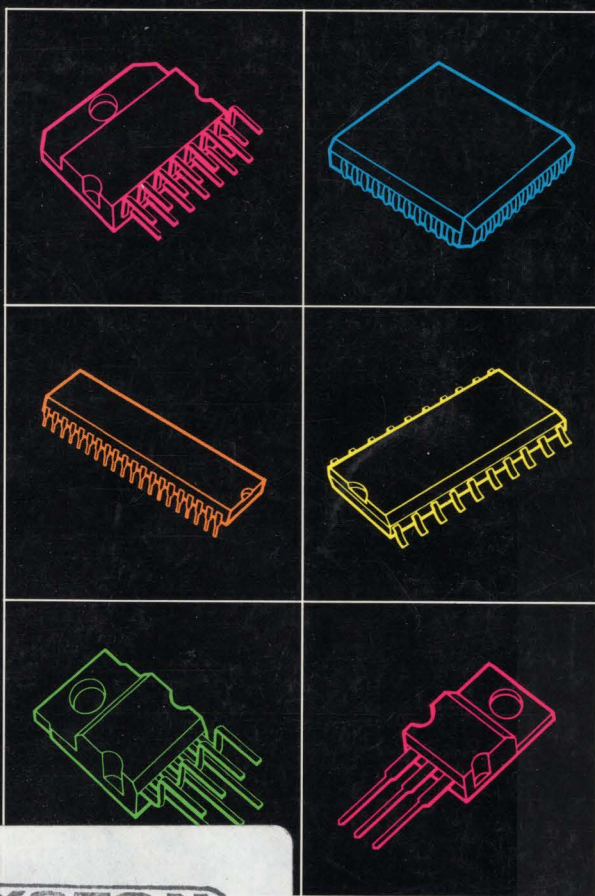


PACKAGING OUTLINES AND DIMENSIONS FOR SELECTED DEDICATED PRODUCTS



000537

RYSTON Electronics

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ELECTRONICS**
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ST-THOMSON
ELECTRONICS

PACKAGING OUTLINES AND DIMENSIONS

**FOR
SELECTED DEDICATED PRODUCTS**

May 1991

Contents

	page	
Introduction	4	
Section 1.0		SURFACE MOUNT PACKAGES 7
		1.1 - Plastic Small Outline (SO) Packages 9
		SO8 11
		SO14 12
		SO16 13
		SO16L 14
		SO20 15
		SO28 16
		1.2 - Plastic Leaded Chip Carriers 17
		PLCC20 19
		PLCC28 20
		PLCC44 21
		PLCC52 22
		PLCC68 23
		1.3 - Plastic Quad Flat Packages 25
		PQFP44 27
		PQFP64 28
Section 2.0		INSERTION PACKAGES 29
		2.1 - Plastic Dual In-Line Packages 31
		Minidip (0.25) 33
		Minidip 34
		DIP14 35
		DIP16 (0.25) 36
		POWERDIP: (8+8), (12+2+2) 37
		Findip 38
		Findip (with Holes) 39
		DIP18 (0.25) 40
		POWERDIP: (9+9), (12+3+3) 41
		DIP20 (0.25) 42
		POWERDIP (16+2+2) 43
		DIP24 (0.25) 44
		SDIP24 45
		DIP28 46
		SDIP30 47
		DIP40 48
		SDIP42 49
		DIP48 50
		2.2 - Power Packages 51
		SOT32 53
		SOT82 54
		SOT82 Surface Mount 55
		SIP9 56
		SIP10 57
		Versawatt (TO220) Short-Leads 58
		Versawatt (TO220) 59

Contents (continued)

Section 2.0	Pentawatt H	page	60
	Pentawatt V		61
	Pentawatt In-Line		62
	Pentawatt H-Neg. Short Leads		63
	Pentawatt H Short Leads		64
	Pentawatt V-Short Leads		65
	Heptawatt H		66
	Heptawatt V		67
	Heptawatt In-Line		68
	Heptawatt Surface Mount		69
	Heptawatt Bumps		70
	Multiwatt8 (Floating)		71
	Multiwatt8 (Pin 5 Ground)		72
	Multiwatt11 V		73
	Multiwatt11 In-Line		74
	Multiwatt11 H-Neg.		75
	Multiwatt15 H		76
	Multiwatt15 V		77
	Multiwatt15 In-line		78
	Multiwatt15 H-Long Leads		79
	Multiwatt15 V-Short Leads		80
	Clipwatt8		81
	Clipwatt11		82
	Clipwatt15		83
	Flexiwatt15 In-Line		84
	Flexiwatt21 H		85
	Flexiwatt21 V		86
	TO3 Four Leads		87
	2.3 - Ceramic Dual In-Line Packages		89
	Minidip		91
	DIP14		92
	DIP14		93
	DIP14 Side Brazed		94
	DIP16		95
	DIP16		96
	DIP16		97
	DIP18		98
	DIP20		99
	DIP22 Side Brazed		100
	DIP24		101
	DIP28		102
	DIP28 Epoxy Seal		103
	DIP40		104
Section 3.0	PACKING		105
Section 4.0	HANDLING AND MOUNTING OF POWER PACKAGES		125
Section 5.0	DEDICATED PRODUCTS INDEX		131

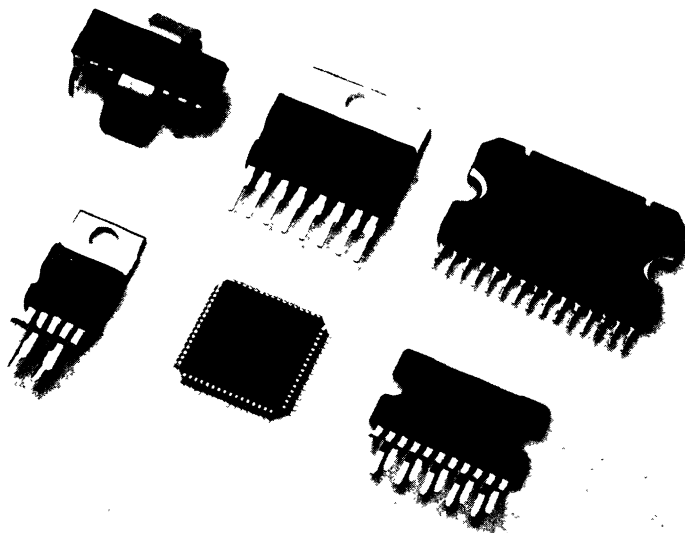
TWENTY YEARS OF INNOVATION

Today the performance and cost of an integrated circuit and its application depend increasingly on the package. This is true for any package, but particularly so in the case of Surface Mounting Technology and very high density systems.

More than 80 packages manufactured by SGS-THOMSON for dedicated ICs, in three large production units in Europe and Asia, cover an extremely wide range of applications from the most traditional (Findip) to the most recent (SO, QFP and PLCC).

Moreover, SGS-THOMSON designs and manufactures power IC packages that are innovative in their structure, materials and fabrication techniques, giving the company its well-earned reputation as the leader in power IC packaging. More than 600 million pieces of the Pentawatt, Heptawatt and Multiwatt packages have been produced and there is a continuous development activity in the field, bringing new packages like the Flexiwatt and Clipwatt.

This book has been created for engineers involved in the design and production of systems, providing detailed mechanical descriptions of every package.



Signal Packages

Number of Pins	Package Name							
	SO		PLCC	QFP	DIP		SDIP	
	150 mils	300 mils			300 mils	600 mils	300 mils	400 mils
3								
5								
7								
8	◆				◆ ○			
9								
10								
11								
14	◆				◆ ○			
15								
16	◆	◆			◆ ○			
18					◆ ○			
20		◆	◆		◆ ○			
21								
22					○			
24						◆ ○	◆	
28		◆	◆			◆ ○		
30								◆
40						◆ ○		
42								◆
44			◆	◆				
48						◆		
52			◆					
64				◆				
68			◆					

◆ = PLASTIC
○ = CERAMIC

Power Packages

Number of Pins	Package Name									
	POWER DIP	SIP	SOT	TO220	PENTAWATT®	HEPTAWATT™	MULTIWATT®	CLIPWATT™	FLEXIWATT™	TO3
3			X	X						
4										X
5					X					
7						X				
8	X						X	X		
9		X								
10		X								
11							X	X		
15							X	X	X	
16	X									
18	X									
20	X									
21									X	

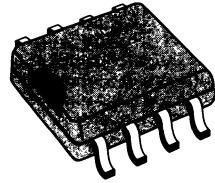
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™ CLIPWATT, FLEXIWATT, HEPTAWATT, are trademarks of companies belonging to the SGS-THOMSON Microelectronics Group.

Section 1.0
SURFACE MOUNT PACKAGES

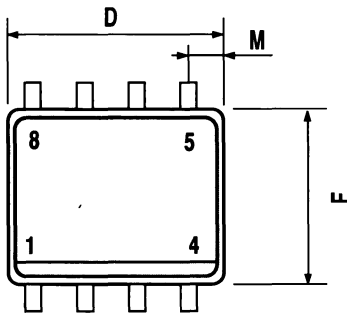
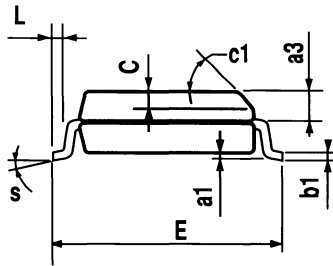
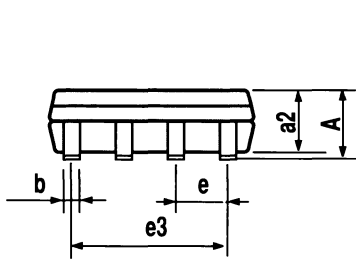
Section 1.1
PLASTIC SMALL OUTLINE (SO) PACKAGES

OUTLINE AND MECHANICAL DATA

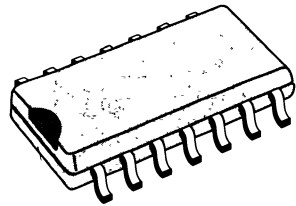


SO8

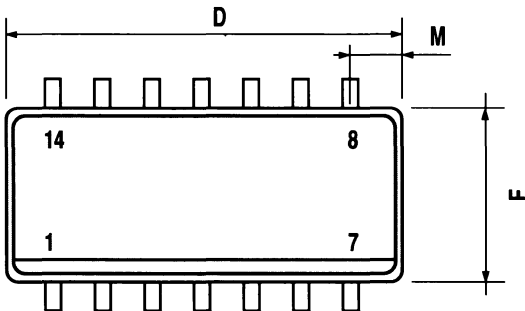
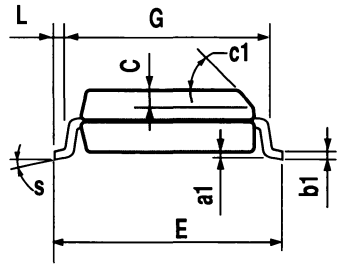
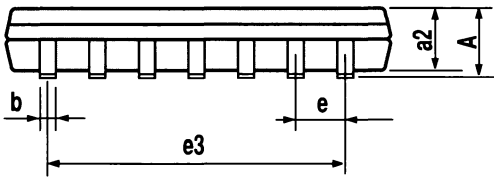
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max.)					



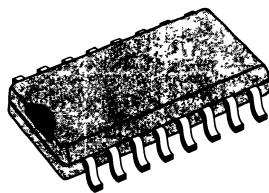
P013M

**OUTLINE AND
 MECHANICAL DATA**

SO14

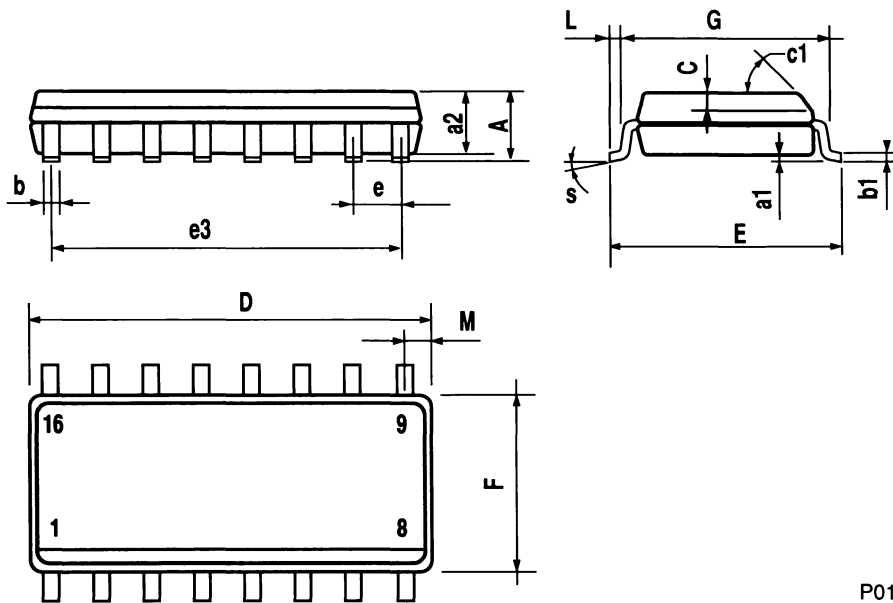
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.2	0.004		0.008
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45° (typ.)					
D	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.15		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.020		0.050
M			0.68			0.027
S	8° (max.)					



P013G

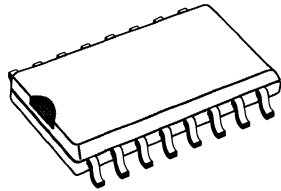
**OUTLINE AND
 MECHANICAL DATA**

SO16

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.2	0.004		0.008
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45° (typ.)					
D	9.8		10	0.386		0.394
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.150		0.157
G	4.6		5.3	0.181		0.209
L	0.5		1.27	0.020		0.050
M			0.62			0.024
S	8° (max.)					



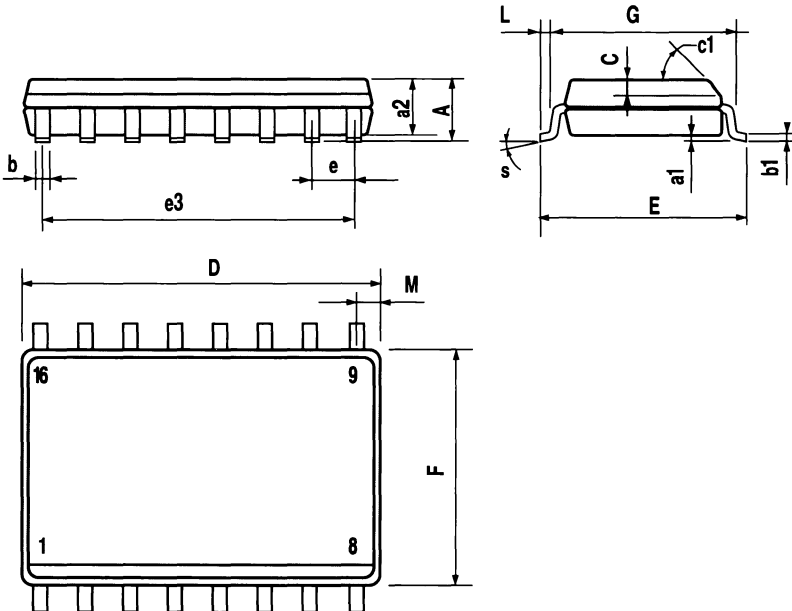
P013H

OUTLINE AND MECHANICAL DATA

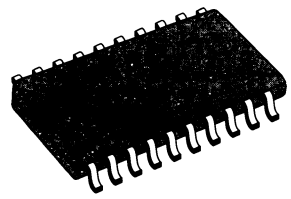


SO16L

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.1		0.2	0.004		0.008
a2			2.45			0.096
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.012
C		0.5			0.020	
c1	45° (typ.)					
D	10.1		10.5	0.397		0.413
E	10.0		10.65	0.393		0.419
e		1.27			0.050	
e3		8.89			0.350	
F	7.4		7.6	0.291		0.300
G	8.8		9.15	0.346		0.360
L	0.5		1.27	0.020		0.050
M			0.75			0.029
S	8° (max.)					

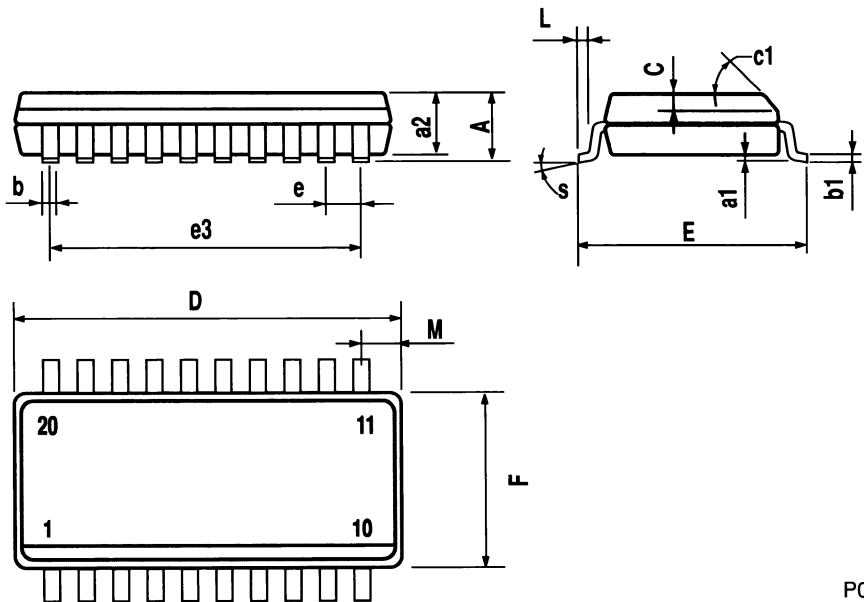


OUTLINE AND MECHANICAL DATA



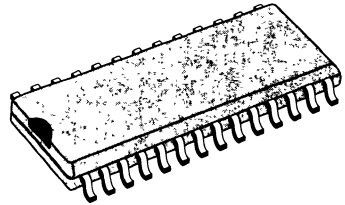
SO20

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.1		0.2	0.004		0.008
a2			2.45			0.096
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.013
C		0.5			0.020	
c1	45° (typ.)					
D	12.6		13.0	0.496		0.510
E	10		10.65	0.394		0.419
e		1.27			0.050	
e3		11.43			0.450	
F	7.4		7.6	0.291		0.300
L	0.5		1.27	0.020		0.050
M			0.75			0.030
S	8° (max.)					



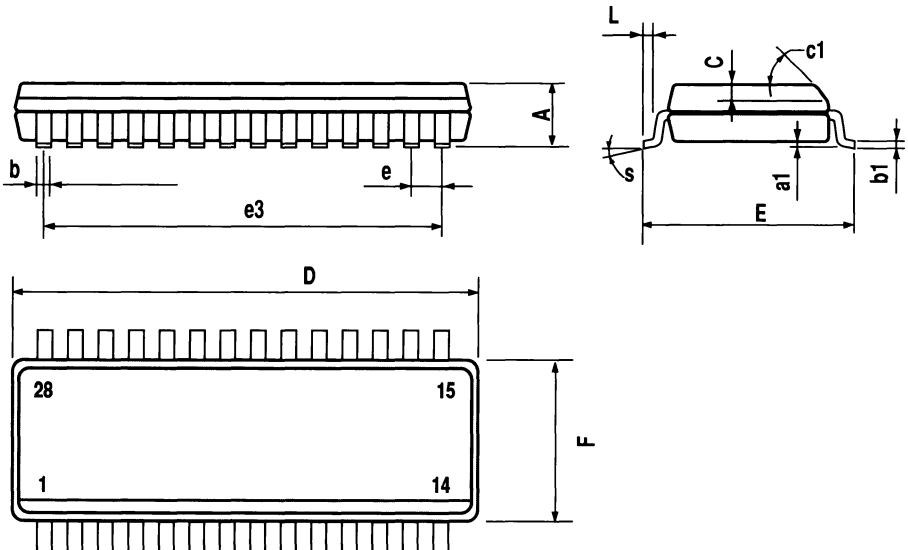
P013L

OUTLINE AND MECHANICAL DATA



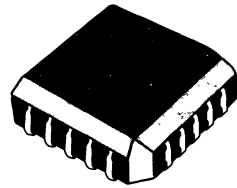
SO28

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.1		0.3	0.004		0.012
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.013
C		0.5			0.020	
c1	45° (typ.)					
D	17.7		18.1	0.697		0.713
E	10		10.65	0.394		0.419
e		1.27			0.050	
e3		16.51			0.65	
F	7.4		7.6	0.291		0.299
L	0.4		1.27	0.016		0.050
S	8° (max.)					

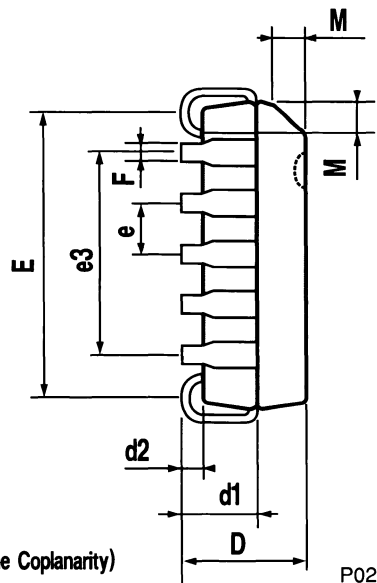
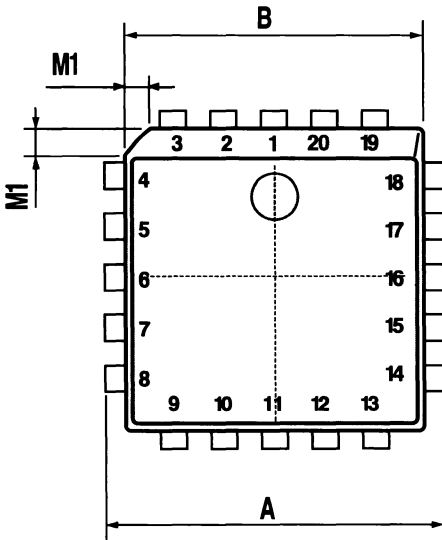


P013N

Section 1.2
PLASTIC LEADED CHIP CARRIERS

**OUTLINE AND
 MECHANICAL DATA**

PLCC20, (15+5)

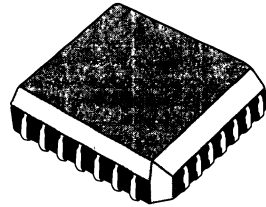
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	9.78		10.03	0.385		0.395
B	8.89		9.04	0.350		0.356
D	4.2		4.57	0.165		0.180
d1		2.54			0.100	
d2		0.56			0.022	
E	7.37		8.38	0.290		0.330
e		1.27			0.050	
e3		5.08			0.200	
F		0.38			0.015	
G			0.101			0.004
M		1.27			0.050	
M1		1.14			0.045	



G (Seating Plane Coplanarity)

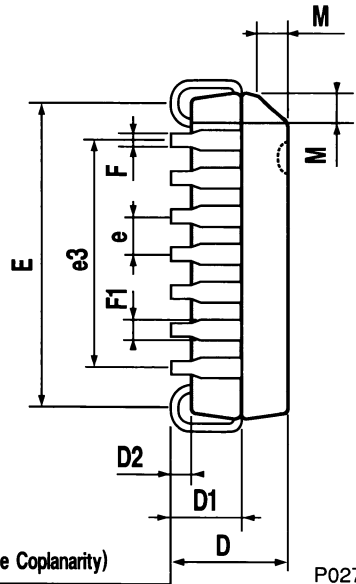
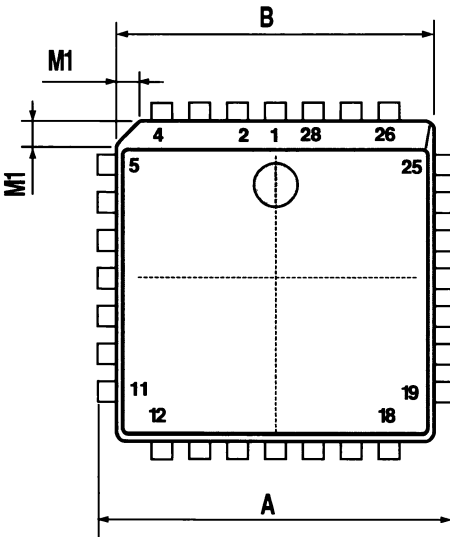
P027A

OUTLINE AND MECHANICAL DATA



PLCC28

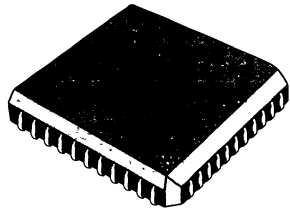
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.32		12.57	0.485		0.495
B	11.43		11.58	0.450		0.456
D	4.2		4.57	0.165		0.180
D1	2.29		3.04	0.090		0.120
D2	0.51			0.020		
E	9.91		10.92	0.390		0.430
e		1.27			0.050	
e3		7.62			0.300	
F		0.46			0.018	
F1		0.71			0.028	
G			0.101			0.004
M		1.24			0.049	
M1		1.143			0.045	



 G (Seating Plane Coplanarity)

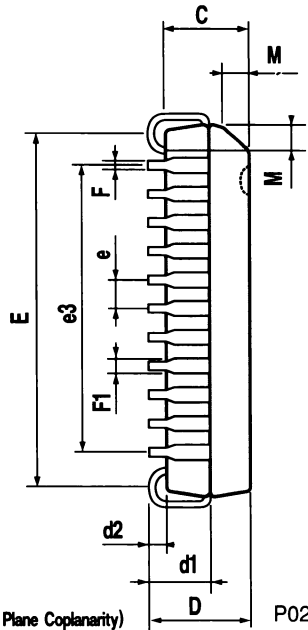
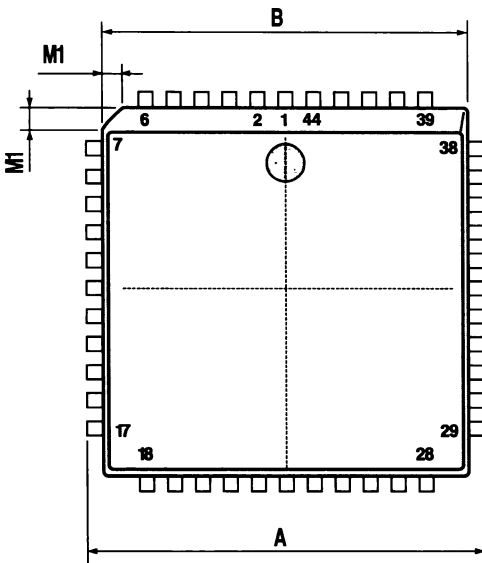
P027E

OUTLINE AND MECHANICAL DATA



PLCC44

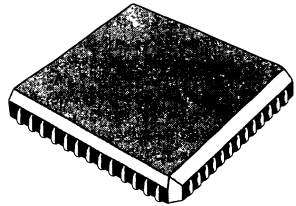
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	17.4		17.65	0.685		0.695
B	16.51		16.65	0.650		0.656
C	3.65		3.7	0.144		0.146
D	4.2		4.57	0.165		0.180
d1	2.59		2.74	0.102		0.108
d2		0.68			0.027	
E	14.99		16	0.590		0.630
e		1.27			0.050	
e3		12.7			0.500	
F		0.46			0.018	
F1		0.71			0.028	
G			0.101			0.004
M		1.16			0.046	
M1		1.14			0.045	



 G (Seating Plane Coplanarity)

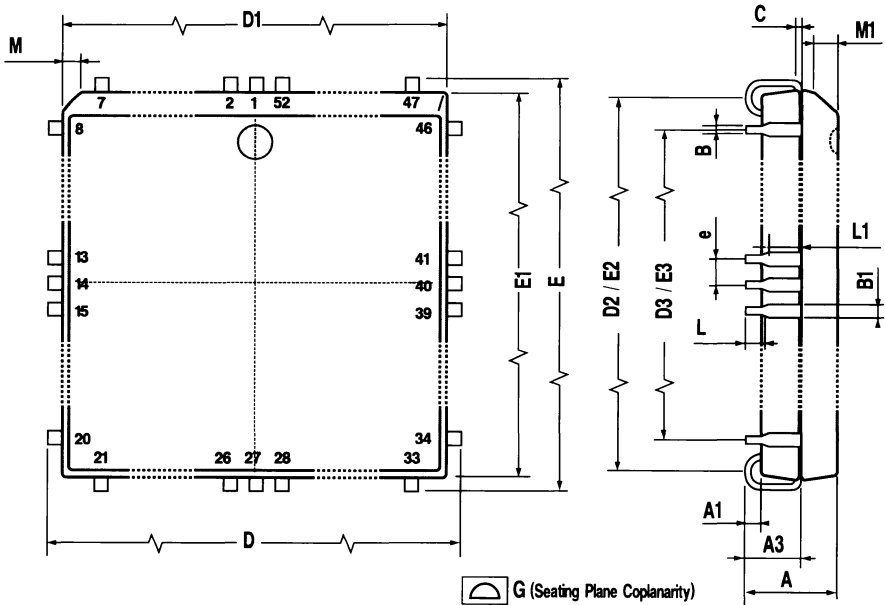
P027B

OUTLINE AND MECHANICAL DATA

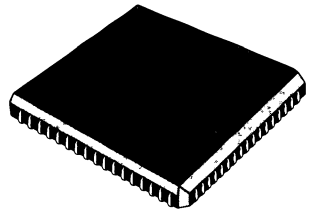


PLCC52

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		4.20	5.08		0.165	0.20
A1		0.51			0.020	
A3		2.29	3.30		0.090	0.13
B		0.33	0.53		0.013	0.021
B1		0.66	0.81		0.026	0.032
C	0.25			0.01		
D		19.94	20.19		0.785	0.795
D1		19.05	19.20		0.750	0.756
D2		17.53	18.54		0.690	0.730
D3	15.24			0.60		
E		19.94	20.19		0.785	0.795
E1		19.05	19.20		0.750	0.756
E2		17.53	18.54		0.690	0.730
E3	15.24			0.60		
e	1.27			0.05		
L		0.64			0.025	
L1		1.53			0.060	
M		1.07	1.22		0.042	0.048
M1		1.07	1.42		0.042	0.056

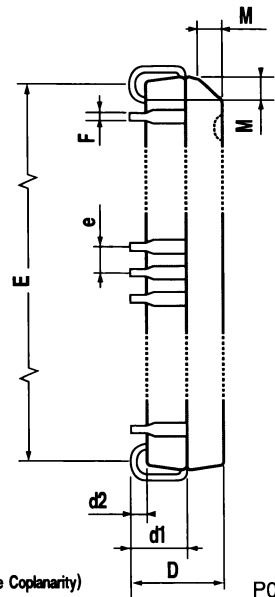
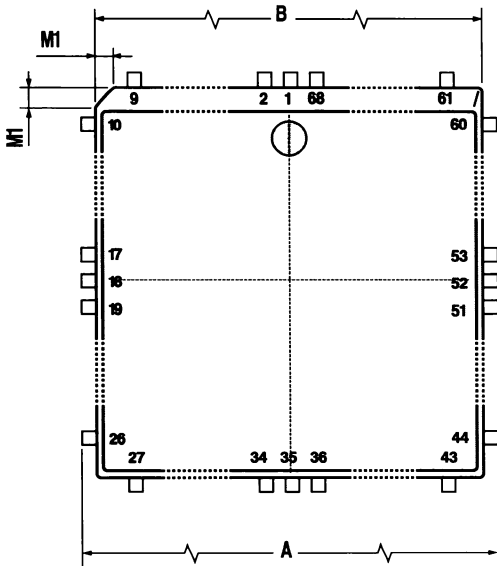


OUTLINE AND MECHANICAL DATA



PLCC68

DIM.	mm			inch		
	MIN	TYP	MAX	MIN	TYP	MAX
A	25.02		25.27	0.985		0.995
B	24.13		24.33	0.950		0.958
D	4.2		5.08	0.165		0.200
d1		2.54			0.100	
d2		0.56			0.022	
E	22.61		23.62	0.890		0.930
e		1.27			0.050	
F		0.38			0.015	
G			0.101			0.004
M		1.27			0.050	
M1		1.14			0.045	

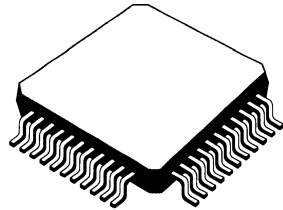


 G (Seating Plane Coplanarity)

P027C

Section 1.3
PLASTIC QUAD FLAT PACKAGES

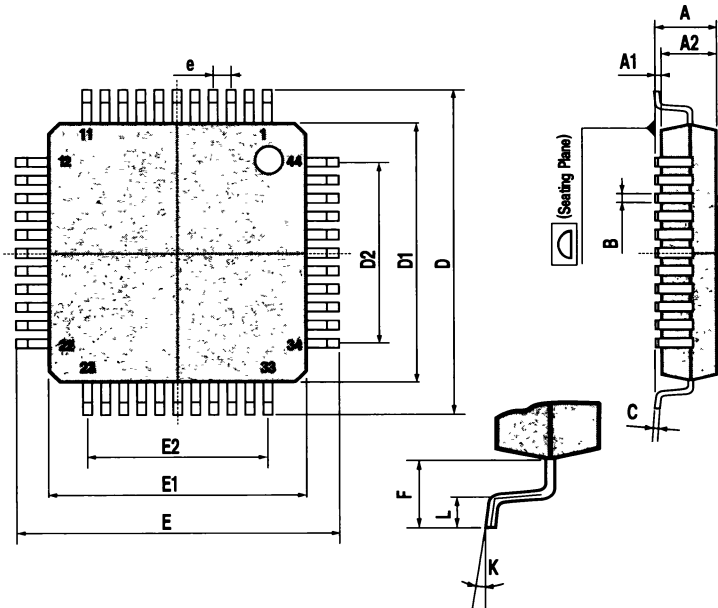
OUTLINE AND MECHANICAL DATA

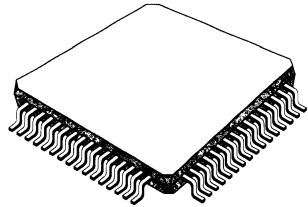


PQFP44 (*)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.40			0.134
A1	0.25			0.01		
A2	2.55	2.80	3.05	0.10	0.11	0.12
B	0.35		0.50	0.014		0.020
C	0.13		0.23	0.005		0.009
D	16.95	17.20	17.45	0.667	0.677	0.687
D1	13.90	14.00	14.10	0.547	0.551	0.555
D2		10.00			0.394	
e		1.00			0.039	
E	16.95	17.20	17.45	0.667	0.677	0.687
E1	13.90	14.00	14.10	0.547	0.551	0.555
E2		10.00			0.394	
F		1.60			0.063	
K	0°(min.), 7°(max.)					
L	0.65	0.80	0.95	0.025	0.031	0.037

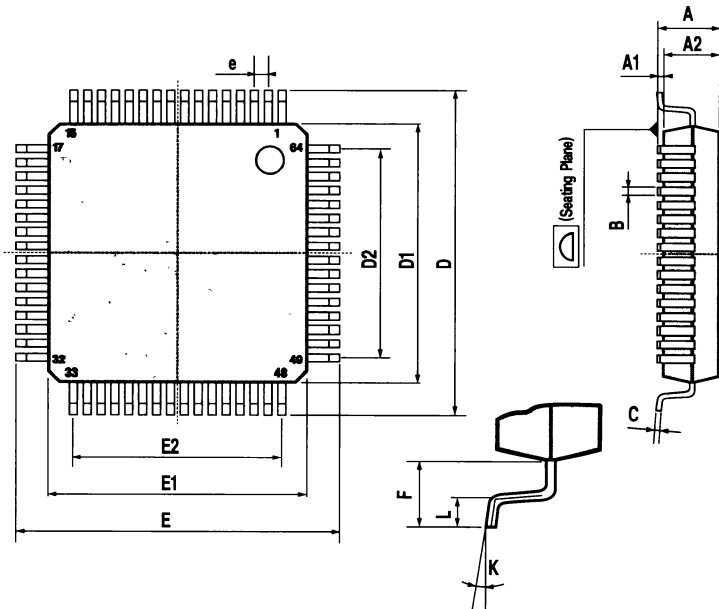
(*) Advanced information on a new package now in development or undergoing evaluation. Details are subject to change without notice.



**OUTLINE AND
 MECHANICAL DATA**

PQFP64 (*)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.40			0.134
A1	0.25			0.01		
A2	2.55	2.80	3.05	0.10	0.11	0.12
B	0.30		0.45	0.012		0.018
C	0.13		0.23	0.005		0.009
D	16.95	17.20	17.45	0.667	0.677	0.687
D1	13.90	14.00	14.10	0.547	0.551	0.555
D2		12.00			0.472	
e		0.80			0.031	
E	16.95	17.20	17.45	0.667	0.677	0.687
E1	13.90	14.00	14.10	0.547	0.551	0.555
E2		12.00			0.472	
F		1.60			0.063	
K	0°(min.), 7°(max.)					
L	0.65	0.80	0.95	0.025	0.031	0.037

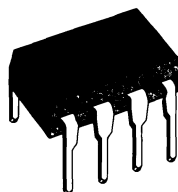
(*) Advanced information on a new package now in development or undergoing evaluation. Details are subject to change without notice.



Section 2.0
INSERTION PACKAGES

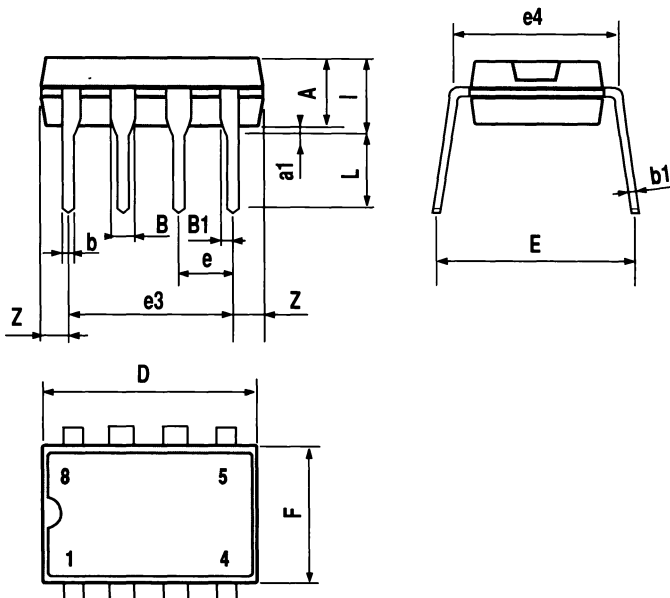
Section 2.1
PLASTIC DUAL IN-LINE PACKAGES

OUTLINE AND MECHANICAL DATA



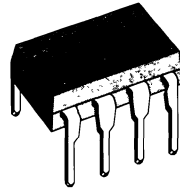
Minidip (0.25)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060



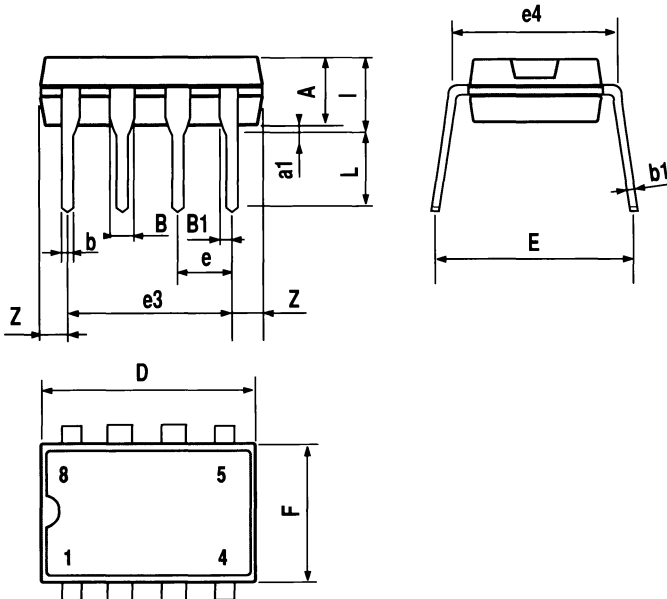
P001W

OUTLINE AND MECHANICAL DATA



Minidip (0.4)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.3			0.130	
a1	0.7			0.028		
B	1.39		1.65	0.055		0.065
B1	0.91		1.04	0.036		0.041
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			9.8			0.386
E		8.8			0.346	
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			7.1			0.280
I			4.8			0.189
L		3.3			0.130	
Z	0.44		1.6	0.017		0.063

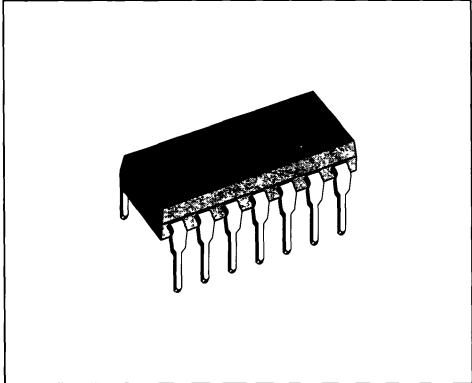


P001F

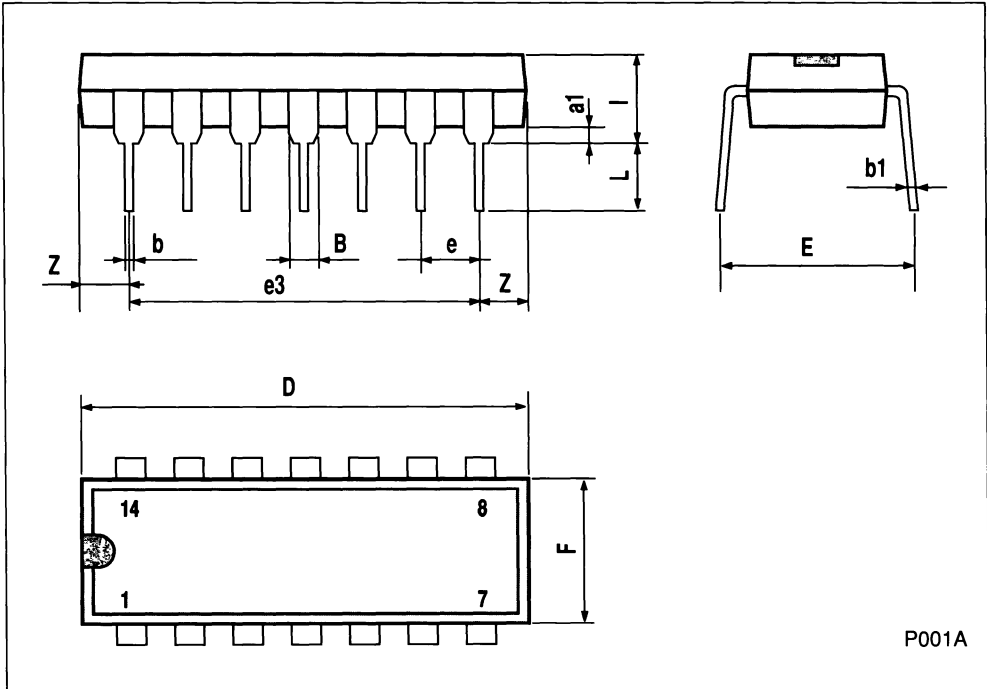
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	1.39		1.65	0.055		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		15.24			0.600	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z	1.27		2.54	0.050		0.100



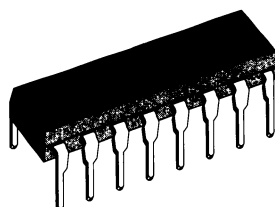
OUTLINE AND MECHANICAL DATA



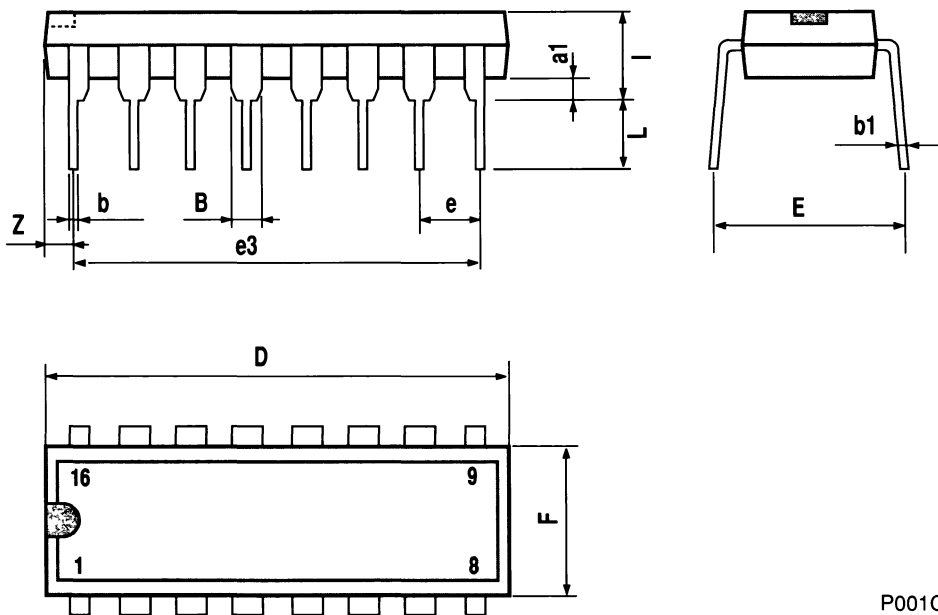
DIP14



P001A

**OUTLINE AND
 MECHANICAL DATA**

DIP16 (0.25)

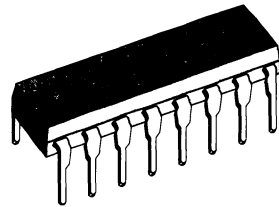
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



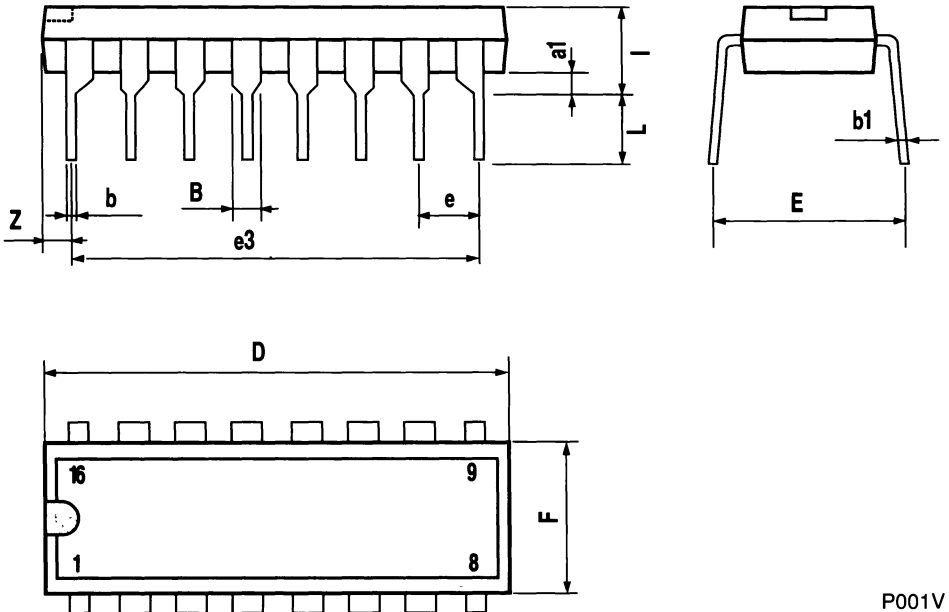
P001C

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.4	0.033		0.055
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			20			0.787
E		8.8			0.346	
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

OUTLINE AND MECHANICAL DATA



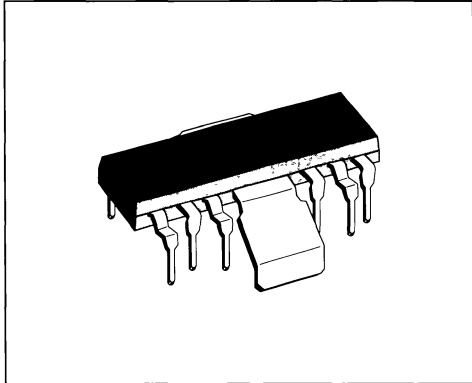
POWERDIP: (8+8), (12+2+2)



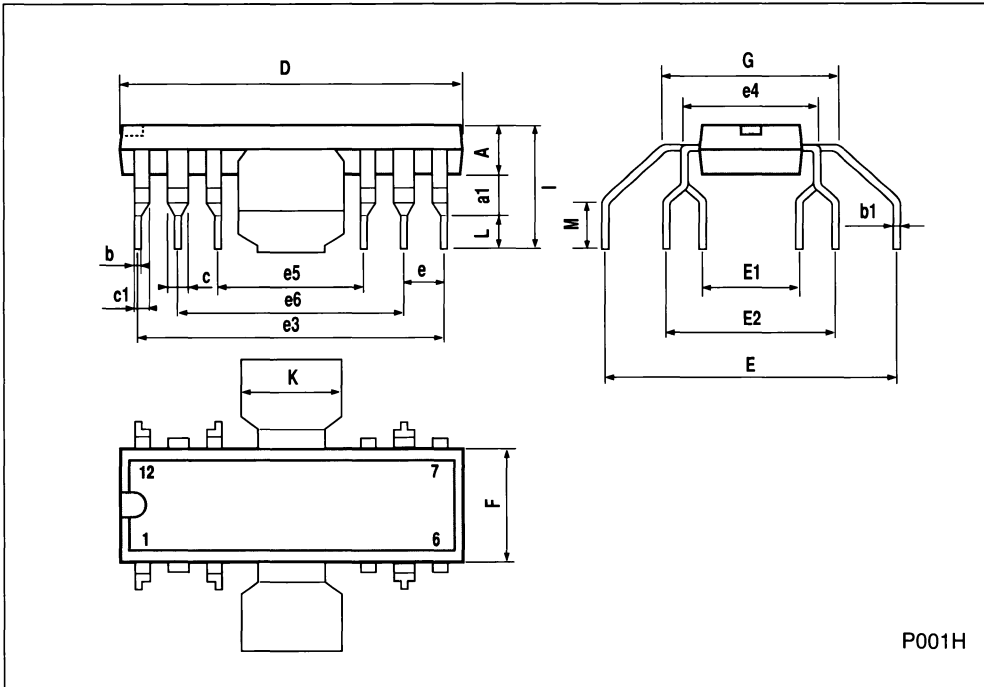
P001V

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	3.8		4.05	0.150		0.159
a1	1.5		1.75	0.059		0.069
b	0.55		0.6	0.022		0.024
b1	0.3		0.35	0.012		0.014
c		1.32			0.052	
c1		0.94			0.037	
D	19.2		19.9	0.756		0.783
E	16.8	17.2	17.6	0.661	0.677	0.693
E1	4.86		5.56	0.191		0.219
E2	10.11		10.81	0.398		0.426
e	2.29	2.54	2.79	0.090	0.100	0.110
e3	17.43	17.78	18.13	0.686	0.700	0.714
e4		7.62			0.300	
e5	7.27	7.62	7.97	0.286	0.300	0.314
e6	12.35	12.7	13.05	0.486	0.500	0.514
F	6.3		7.1	0.248		0.280
G		9.8			0.386	
I	7.8		8.6	0.307		0.339
K	6.1		6.5	0.240		0.256
L	2.5		2.9	0.098		0.114
M	2.5		3.1	0.098		0.122

OUTLINE AND MECHANICAL DATA

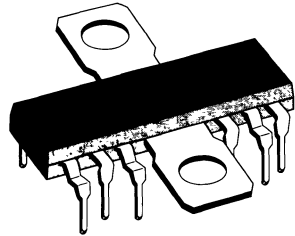


Findip



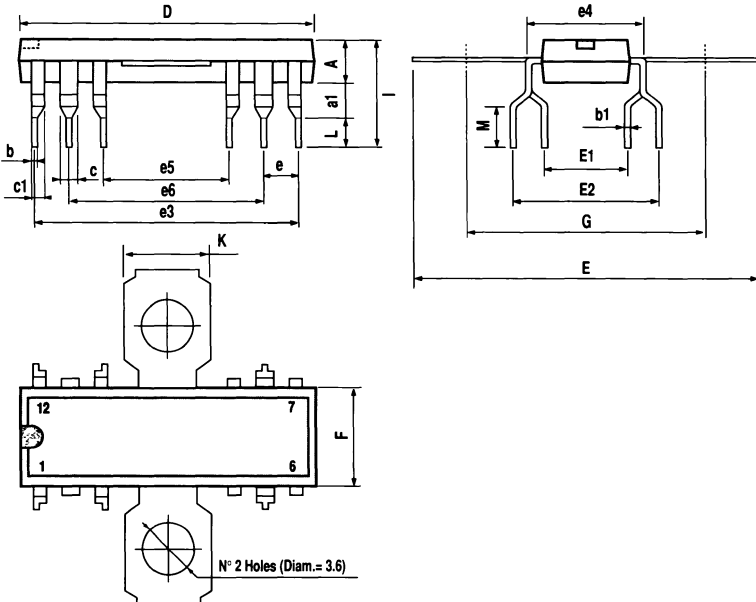
P001H

OUTLINE AND MECHANICAL DATA



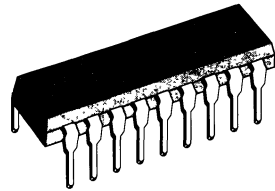
Findip (with holes)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	3.8		4.05	0.150		0.159
a1	1.5		1.75	0.059		0.069
b	0.55		0.6	0.022		0.024
b1	0.3		0.35	0.012		0.014
c		1.32			0.052	
c1		0.94			0.037	
D	19.2		19.9	0.756		0.783
E			25.5			1.004
E1	4.86		5.56	0.191		0.219
E2	10.11		10.81	0.398		0.426
e	2.29	2.54	2.79	0.090	0.100	0.110
e3	17.43	17.78	18.13	0.686	0.700	0.714
e4		7.62			0.300	
e5	7.27	7.62	7.97	0.286	0.300	0.314
e6	12.35	12.7	13.05	0.486	0.500	0.514
F	6.3		7.1	0.248		0.280
G	16.19		16.8	0.637		0.661
I	7.8		8.6	0.307		0.339
K	6.1		6.5	0.240		0.256
L	2.5		2.9	0.098		0.114
M	2.5		3.1	0.098		0.122



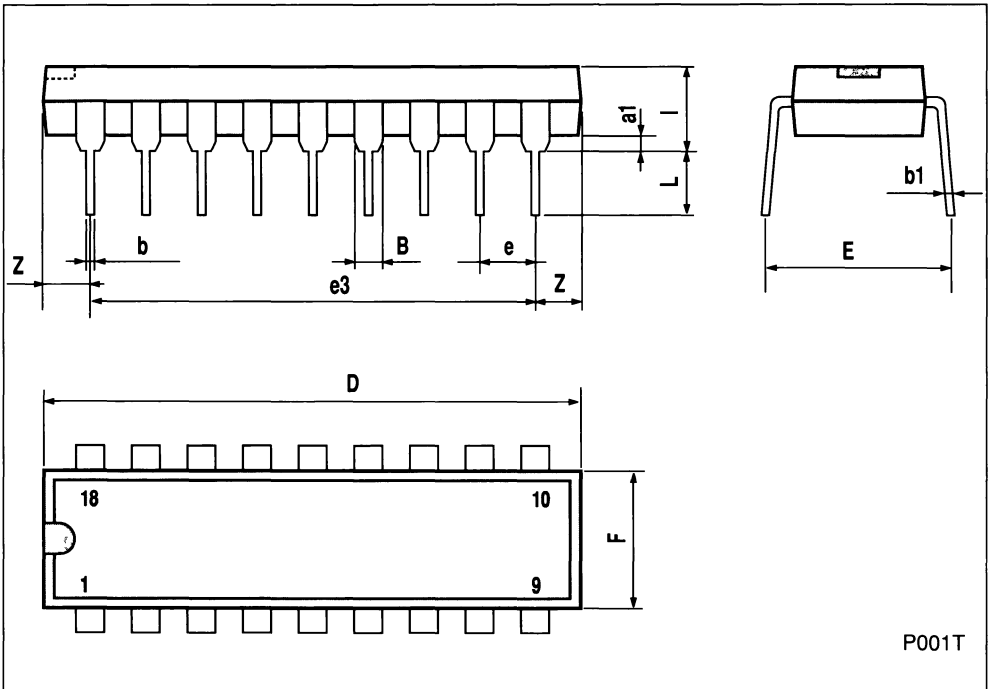
P0011

OUTLINE AND MECHANICAL DATA



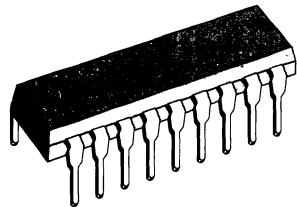
DIP18 (0.25)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.064
b		0.46			0.018	
b1		0.25			0.010	
D			23.24			0.914
E		8.5			0.335	
e		2.54			0.100	
e3		20.32			0.800	
F			7.1			0.280
I			3.93			0.155
L		3.3			0.130	
Z		1.27	1.59		0.050	0.062



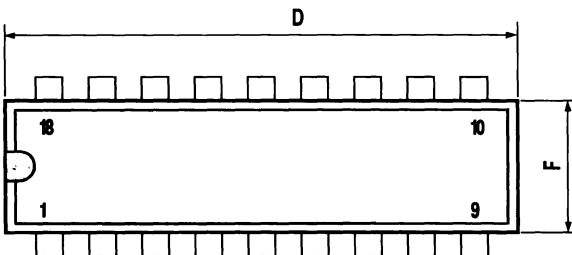
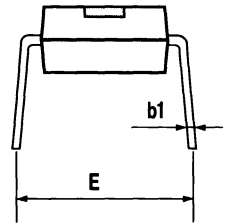
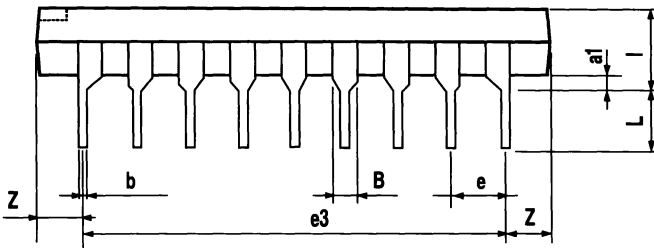
P001T

OUTLINE AND MECHANICAL DATA

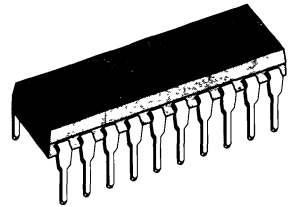


POWERDIP: (9+9), (12+3+3)

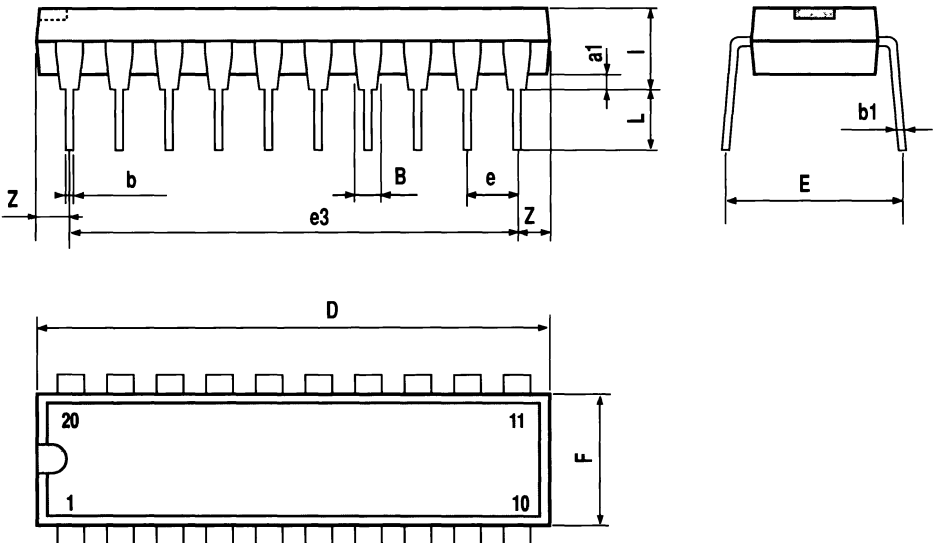
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.4	0.033		0.055
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			24.8			0.976
E		8.8			0.346	
e		2.54			0.100	
e3		20.32			0.800	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			2.54			0.100



P001U

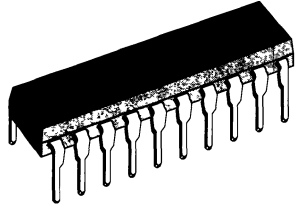
**OUTLINE AND
 MECHANICAL DATA**

DIP20 (0.25)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25		0.010		
D			25.4			1.000
E		8.5		0.335		
e		2.54		0.100		
e3		22.86		0.900		
F			7.1			0.280
I			3.93			0.155
L		3.3		0.130		
Z			1.34			0.053



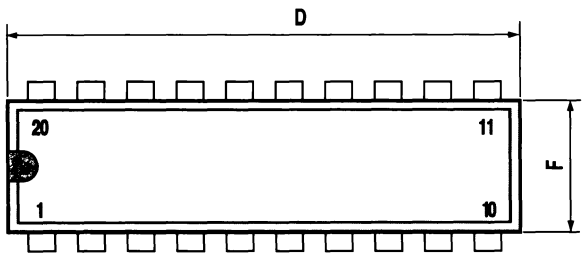
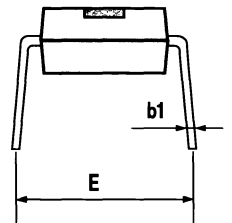
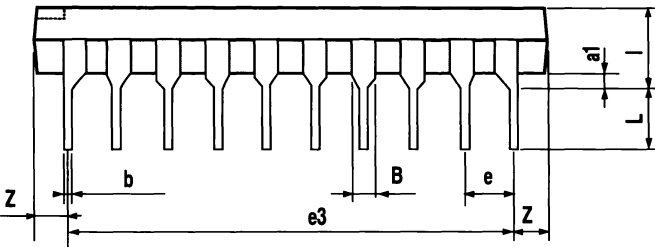
P001J

OUTLINE AND MECHANICAL DATA



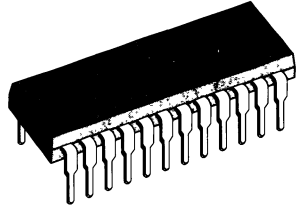
POWERDIP (16+2+2)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.4	0.033		0.055
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			24.8			0.976
E		8.8			0.346	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



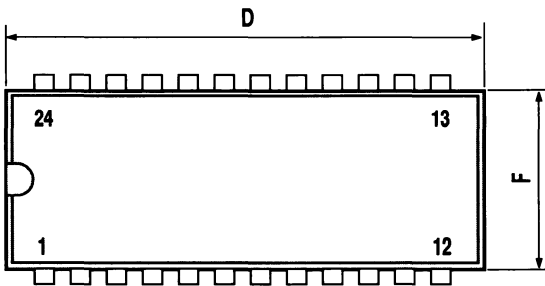
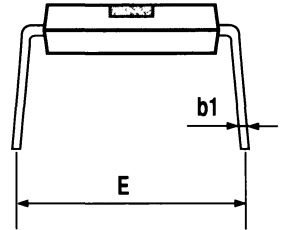
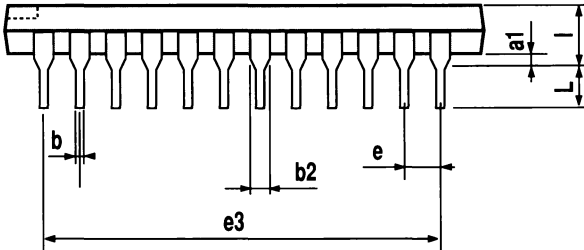
P001X

OUTLINE AND MECHANICAL DATA

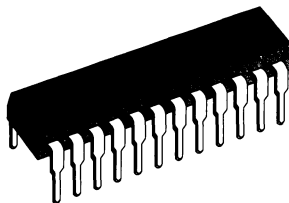


DIP24 (0.25)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1		0.63			0.025	
b		0.45			0.018	
b1	0.23		0.31	0.009		0.012
b2		1.27			0.050	
D			32.2			1.268
E	15.2		16.68	0.598		0.657
e		2.54			0.100	
e3		27.94			1.100	
F			14.1			0.555
I		4.445			0.175	
L		3.3			0.130	

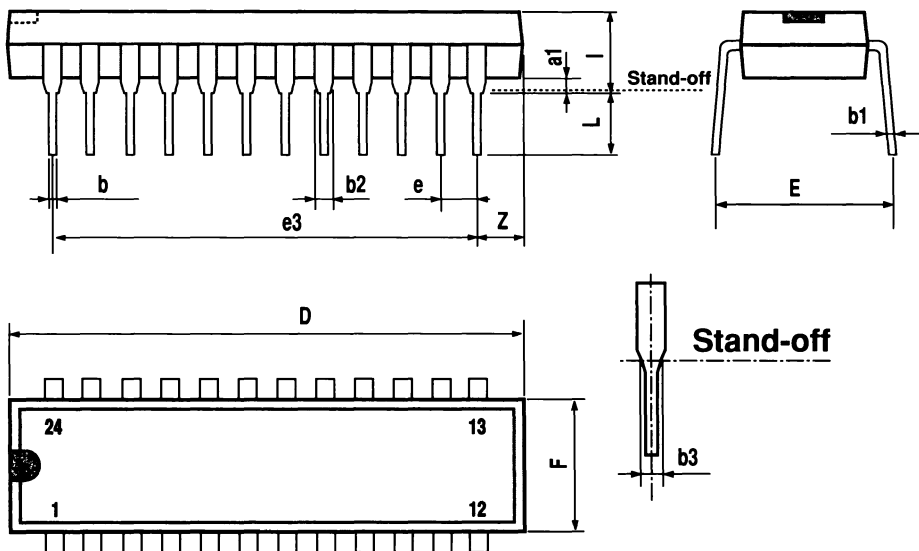


OUTLINE AND MECHANICAL DATA

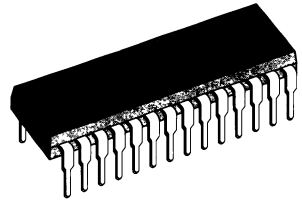


SDIP24

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.3			0.130	
a1	0.51			0.020		
b	0.35		0.59	0.014		0.023
b1	0.2		0.36	0.008		0.014
b2	0.75		1.42	0.030		0.056
b3	0.75		0.030			
D			23.11			0.910
E	7.95		9.73	0.313		0.383
e		1.778			0.070	
e3		19.558			0.770	
e4		7.62			0.300	
F			6.86			0.270
I			5.08			0.200
L	2.54			0.100		

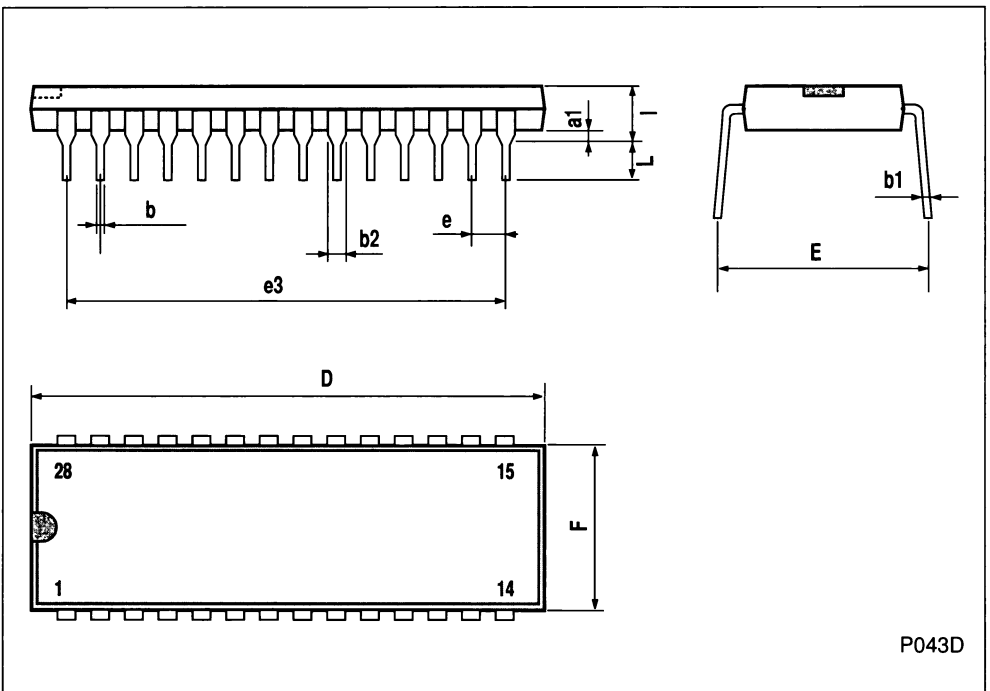


OUTLINE AND MECHANICAL DATA



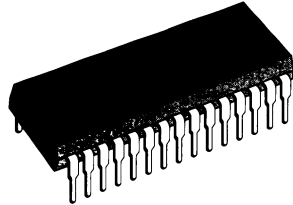
DIP28

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1		0.63			0.025	
b		0.45			0.018	
b1	0.23		0.31	0.009		0.012
b2		1.27			0.050	
D			37.34			1.470
E	15.2		16.68	0.598		0.657
e		2.54			0.100	
e3		33.02			1.300	
F			14.1			0.555
l		4.445			0.175	
L		3.3			0.130	



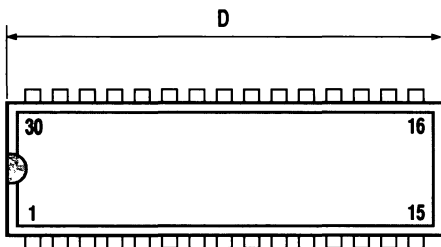
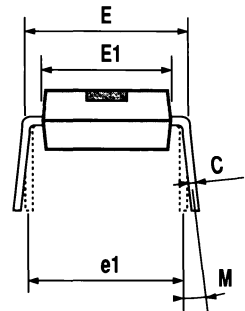
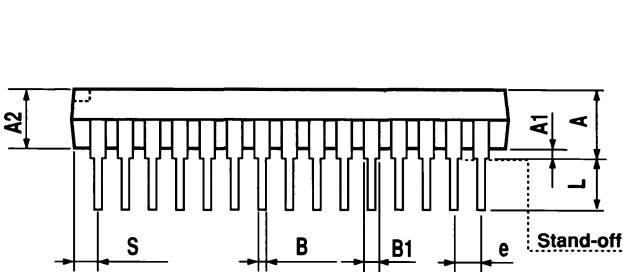
P043D

OUTLINE AND MECHANICAL DATA



SDIP30

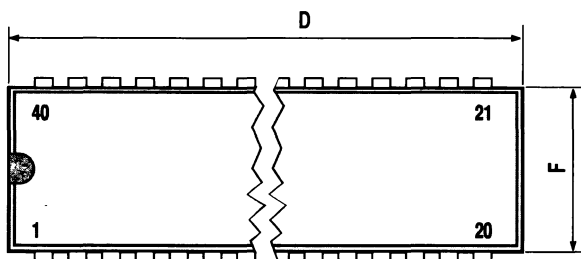
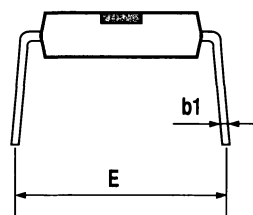
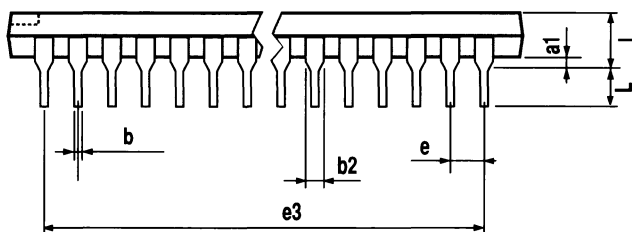
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5.08			0.20
A1	0.51			0.020		
A2	3.05	3.81	4.57	0.12	0.15	0.18
B	0.36	0.46	0.56	0.014	0.018	0.022
B1	0.76	0.99	1.40	0.030	0.039	0.055
C	0.20	0.25	0.36	0.008	0.01	0.014
D	27.43	27.94	28.45	1.08	1.10	1.12
E	10.16	10.41	11.05	0.400	0.410	0.435
E1	8.38	8.64	9.40	0.330	0.340	0.370
e		1.78			0.070	
e1		10.16			0.400	
L	2.54	3.30	3.81	0.10	0.13	0.15
M	0°(min) , 15°(max)					
S	0.31			0.012		



**OUTLINE AND
 MECHANICAL DATA**

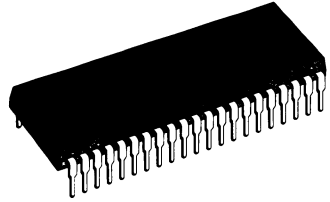
DIP40

DIM.	mm			inch		
	MIN	TYP	MAX	MIN	TYP	MAX
a1		0.63			0.025	
b		0.45			0.018	
b1	0.23		0.31	0.009		0.012
b2		1.27			0.050	
D			52.58			2.070
E	15.2		16.68	0.598		0.657
e		2.54			0.100	
e3		48.26			1.900	
F			14.1			0.555
I		4.445			0.175	
L		3.3			0.130	



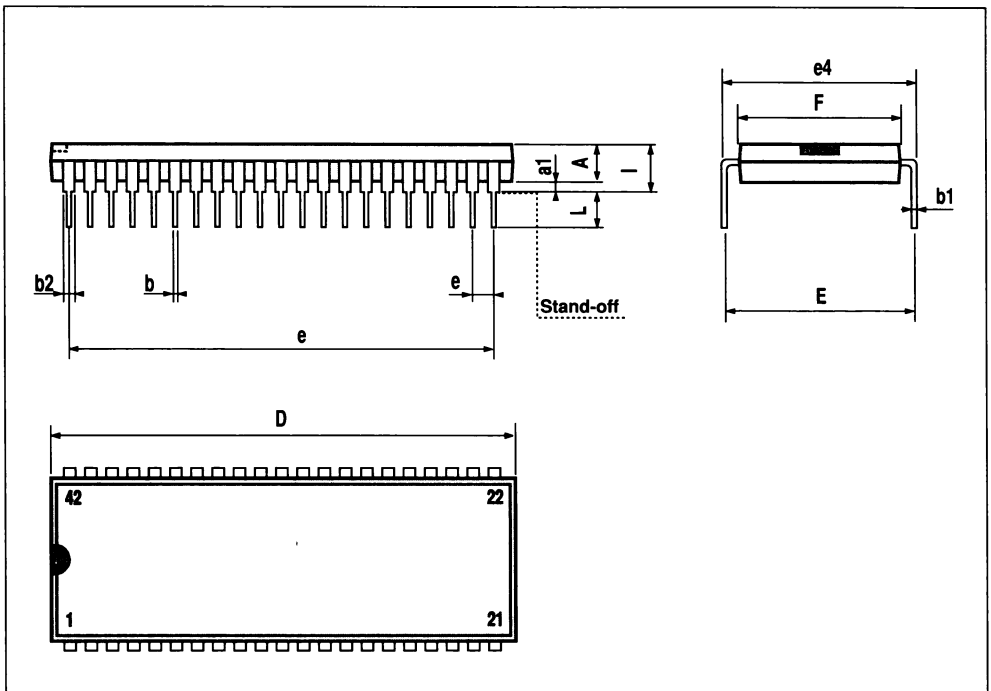
P043E

OUTLINE AND MECHANICAL DATA

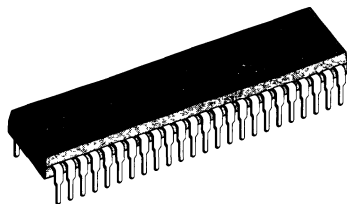


SDIP42

DIM.	mm			Inch		
	MIN	TYP	MAX	MIN	TYP	MAX
A	3.30			0.130		
a1		0.51			0.020	
b		0.35	0.59		0.014	0.023
b1		0.20	0.36		0.008	0.014
b2		0.75	1.42		0.030	0.055
b3		0.75			0.030	
D			39.12			1.540
E		15.57	17.35		0.613	0.683
e	1.778			0.070		
e3	35.56			1.400		
e4	15.24			0.600		
F			14.48			0.570
I			5.08			0.200
L		2.54			0.100	

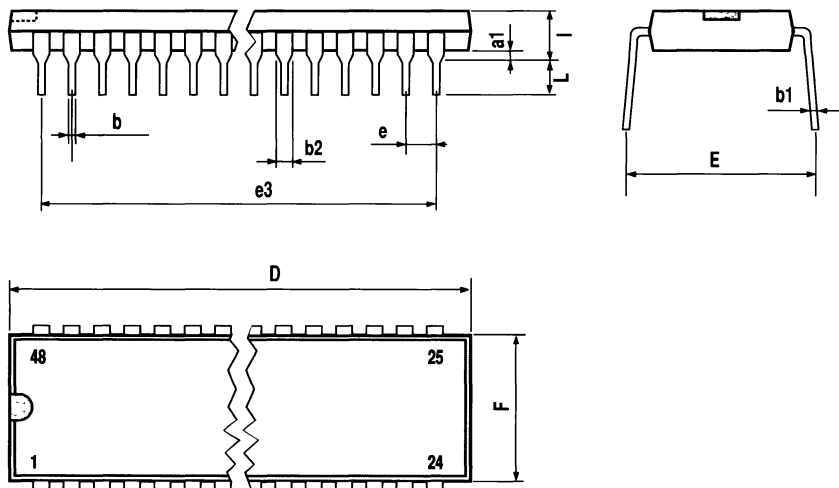


OUTLINE AND MECHANICAL DATA



DIP48

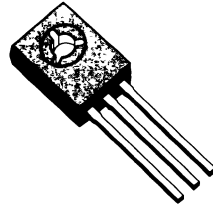
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1		0.63			0.025	
b		0.45			0.018	
b1	0.23		0.31	0.009		0.012
b2		1.27			0.050	
D			62.74			2.470
E	15.2		16.68	0.598		0.657
e		2.54			0.100	
e3		58.42			2.300	
F			14.1			0.555
l		4.445			0.175	
L		3.3			0.130	



Section 2.2

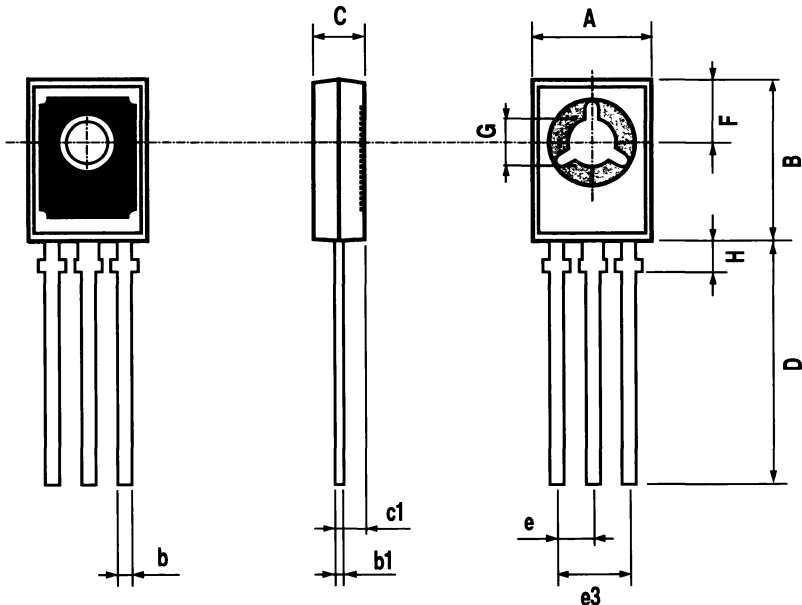
POWER PACKAGES

OUTLINE AND MECHANICAL DATA



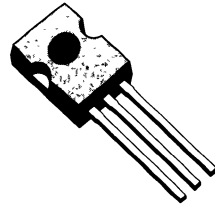
SOT32

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.425
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.094		0.106
c1		1.2			0.047	
D	15.7			0.618		
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100



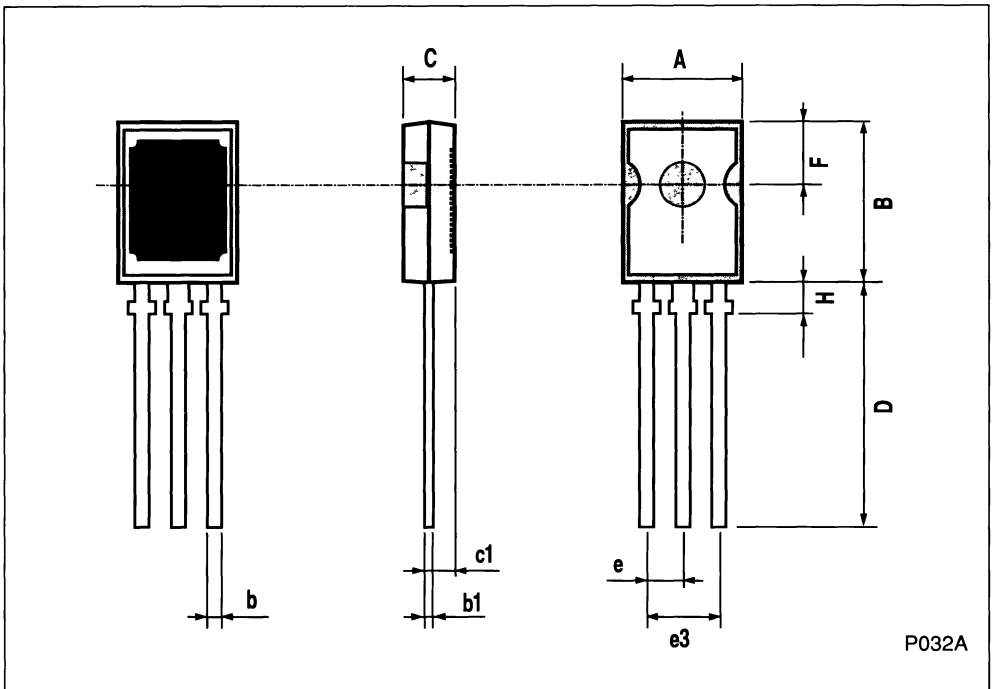
P032

OUTLINE AND MECHANICAL DATA



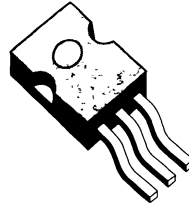
SOT82

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.425
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.094		0.106
c1		1.2			0.047	
D		15.7			0.618	
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
H			2.54		0.100	



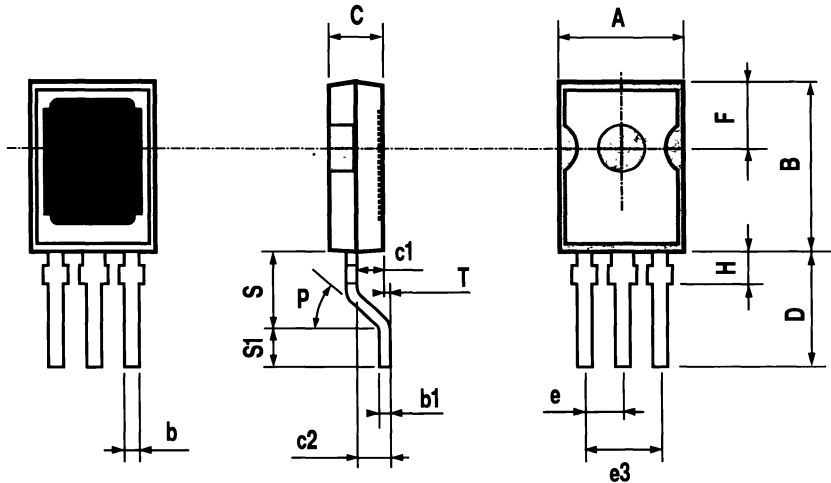
P032A

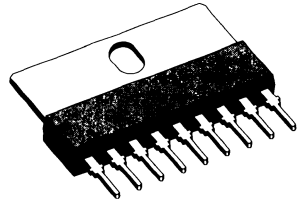
OUTLINE AND MECHANICAL DATA



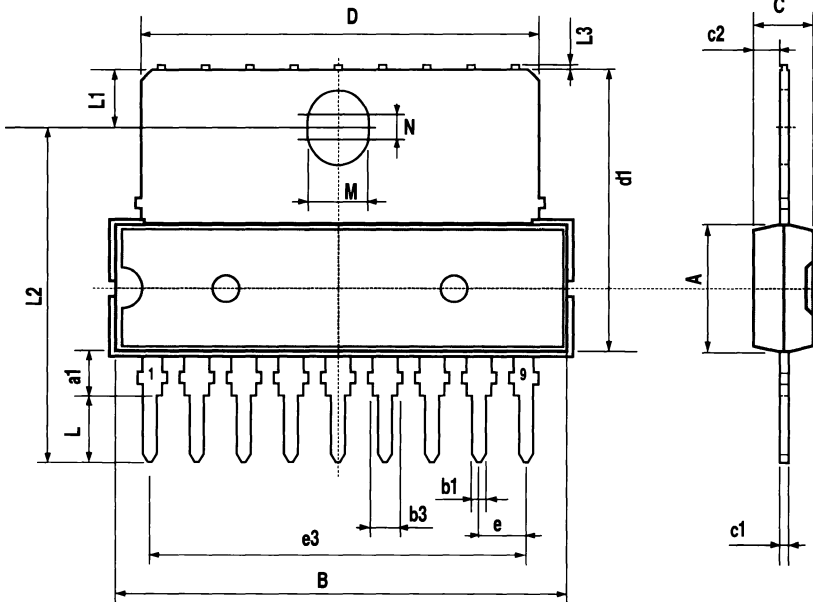
SOT82 Surface Mount

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.425
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.094		0.106
c1		1.2			0.047	
c2		1.3			0.051	
D		6			0.236	
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
H			2.54			0.100
P	45° (typ.)					
S		4			0.157	
S1		2			0.079	
T		0.1			0.004	

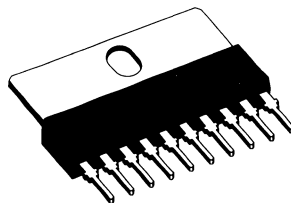


**OUTLINE AND
 MECHANICAL DATA**

SIP9

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			7.1			0.280
a1	2.7		3	0.106		0.118
B			24.8			0.976
b1		0.5			0.020	
b3	0.85		1.6	0.033		0.063
C		3.3			0.130	
c1		0.43			0.017	
c2		1.32			0.052	
D			21.2			0.835
d1		14.5			0.571	
e		2.54			0.100	
e3		20.32			0.800	
L	3.1			0.122		
L1		3			0.118	
L2		17.6			0.693	
L3			0.25			0.010
M		3.2			0.126	
N		1			0.039	

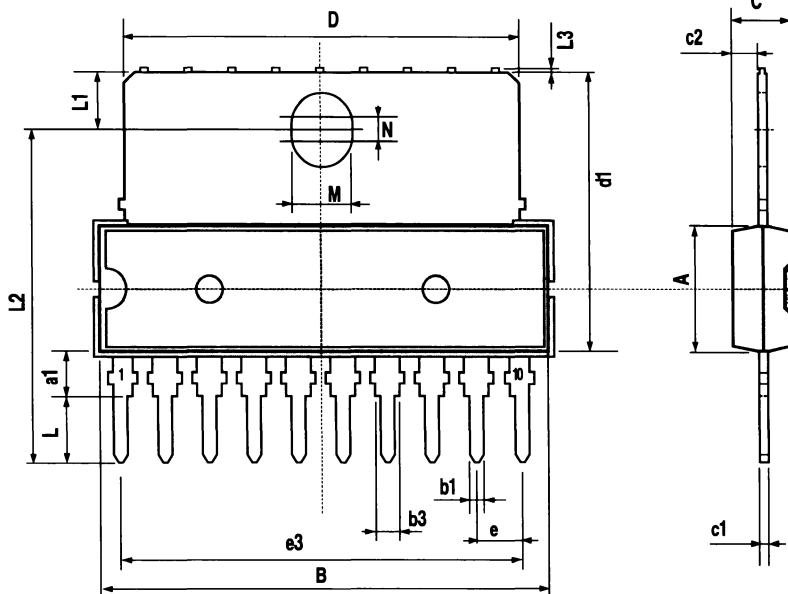

P030A

OUTLINE AND MECHANICAL DATA



SIP10

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			7.1			0.280
a1	2.7		3	0.106		0.118
B			24.8			0.976
b1		0.5			0.020	
b3	0.85		1.6	0.033		0.063
C		3.3			0.130	
c1		0.43			0.017	
c2		1.32			0.052	
D			23.7			0.933
d1		14.5			0.571	
e		2.54			0.100	
e3		22.86			0.900	
L	3.1			0.122		
L1		3			0.118	
L2		17.6			0.693	
L3			0.25			0.010
M		3.2			0.126	
N		1			0.039	

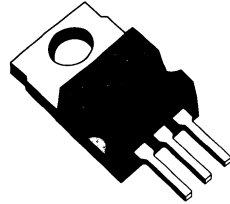


P030B

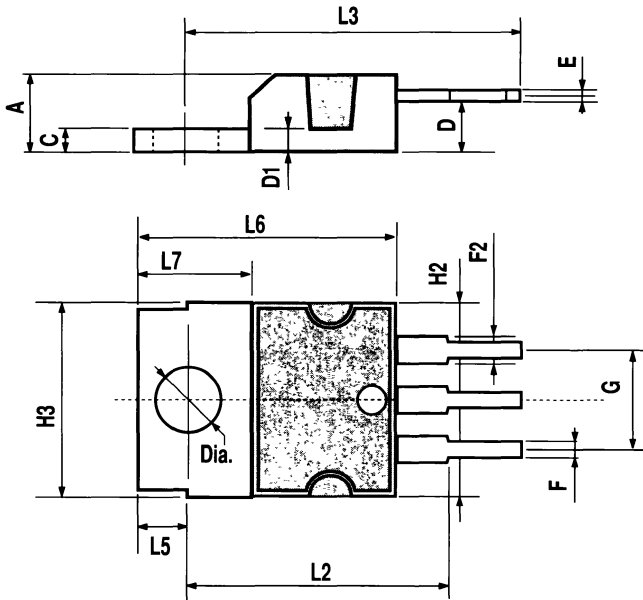
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F2	1.15		1.4	0.045		0.055
G	4.95	5.08	5.21	0.195	0.200	0.205
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L2		16.2			0.638	
L3	19	19.8	20.6	0.748	0.780	0.811
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
Dia	3.65		3.85	0.144		0.152



OUTLINE AND MECHANICAL DATA



TO220 Short-Leads

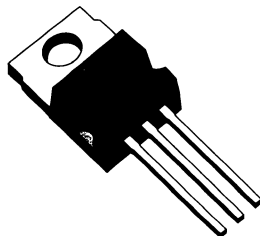


P011I

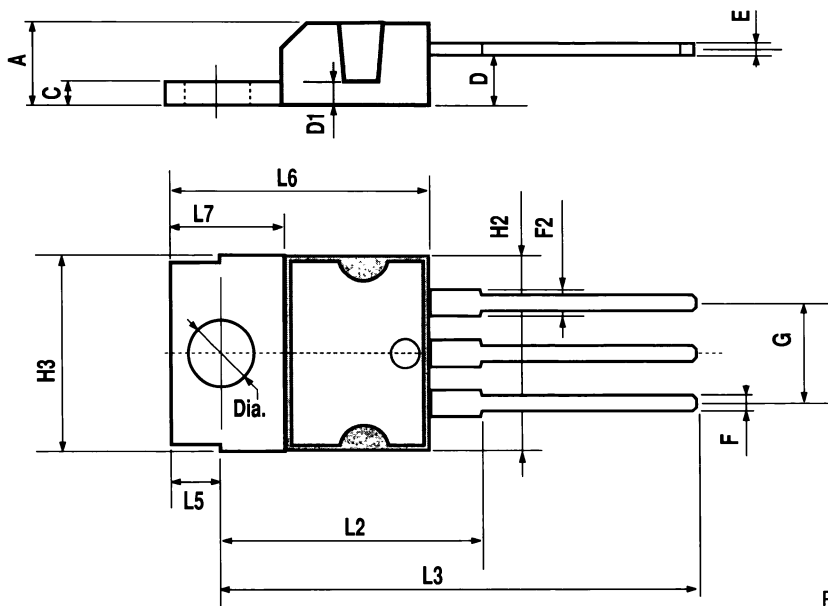
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F2	1.15		1.4	0.045		0.055
G	4.95	5.08	5.21	0.195	0.200	0.205
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L2		16.2			0.638	
L3	26.3	26.7	27.1	1.035	1.051	1.067
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
Dia	3.65		3.85	0.144		0.152



OUTLINE AND MECHANICAL DATA

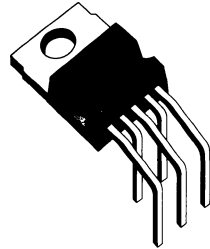


TO220



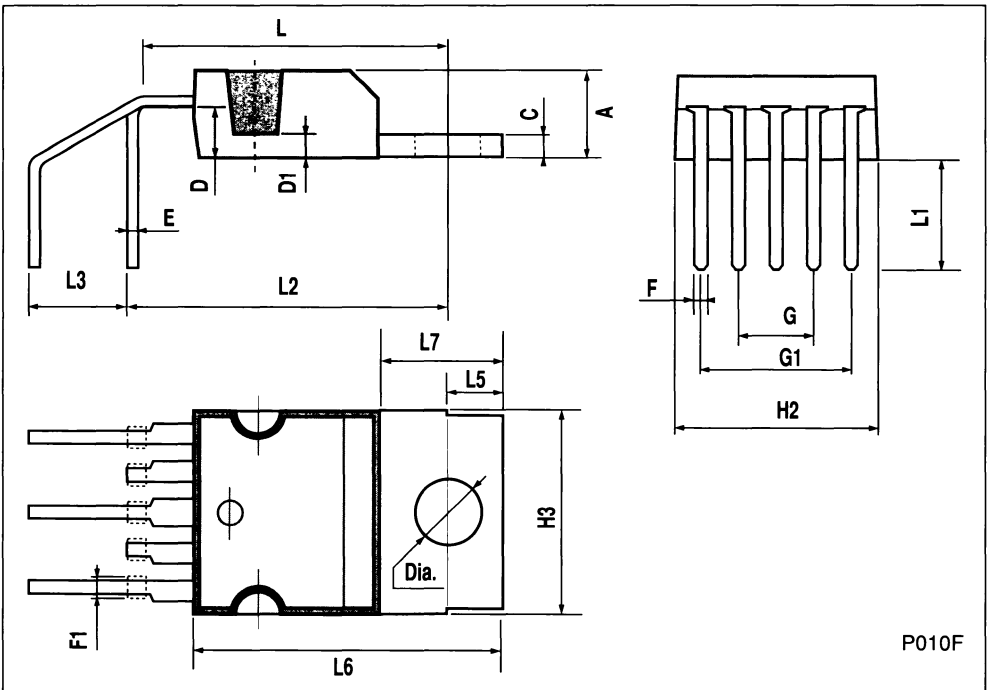
P011D

OUTLINE AND MECHANICAL DATA



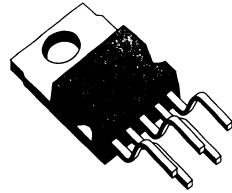
Pentawatt H

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F1	1		1.4	0.039		0.055
G	3.2	3.4	3.6	0.126	0.134	0.142
G1	6.6	6.8	7	0.260	0.268	0.276
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		14.2			0.559	
L1		6			0.236	
L2		14.8			0.583	
L3	3.6		4.2	0.142		0.165
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
Dia	3.65		3.85	0.144		0.152



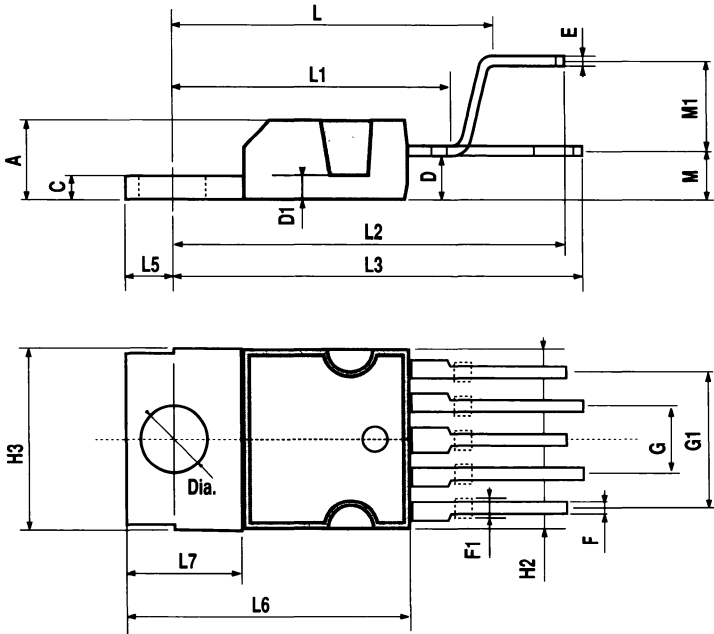
P010F

**OUTLINE AND
MECHANICAL DATA**



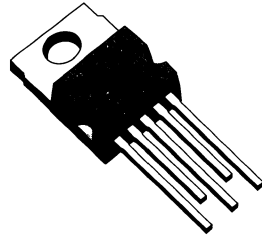
Pentawatt V

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F1	1		1.4	0.039		0.055
G	3.2	3.4	3.6	0.126	0.134	0.142
G1	6.6	6.8	7	0.260	0.268	0.276
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		17.85			0.703	
L1		15.75			0.620	
L2		21.4			0.843	
L3		22.5			0.886	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		4.5			0.177	
M1		4			0.157	
Dia	3.65		3.85	0.144		0.152



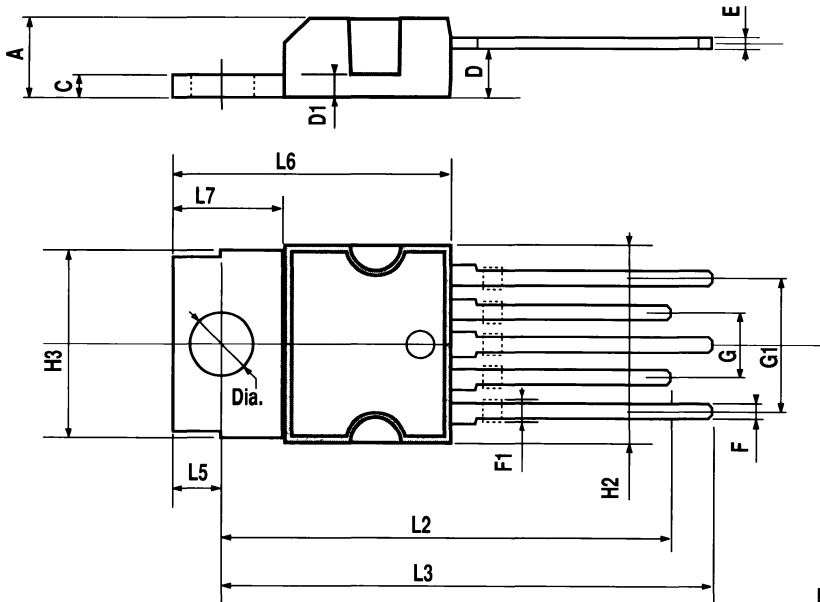
P010E

OUTLINE AND MECHANICAL DATA



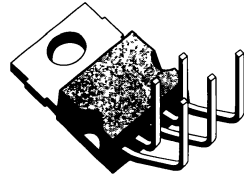
Pentawatt (In-Line)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F1	1		1.4	0.039		0.055
G	3.2	3.4	3.6	0.126	0.134	0.142
G1	6.6	6.8	7	0.260	0.268	0.276
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L2	23.05	23.4	23.8	0.907	0.921	0.937
L3	25.3	25.65	26.1	0.996	1.010	1.028
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
Dia	3.65		3.85	0.144		0.152



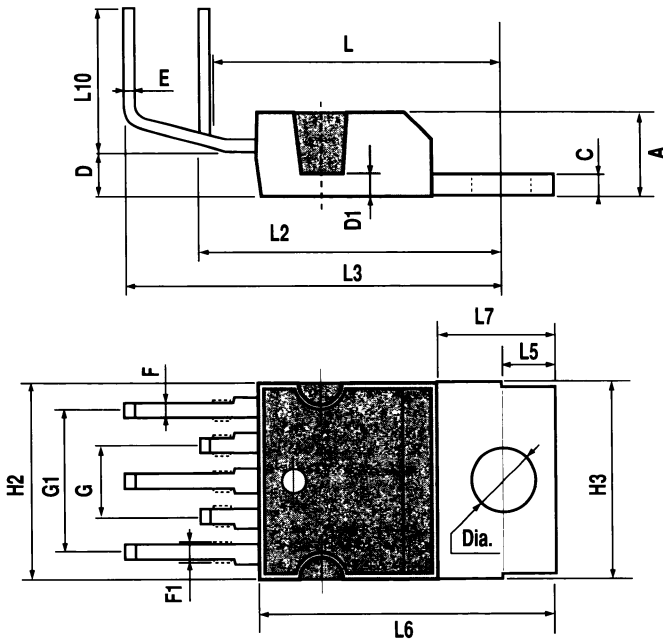
P010D

OUTLINE AND MECHANICAL DATA

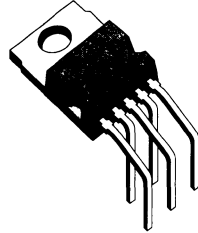


Pentawatt H (Up-sided Short Leads)

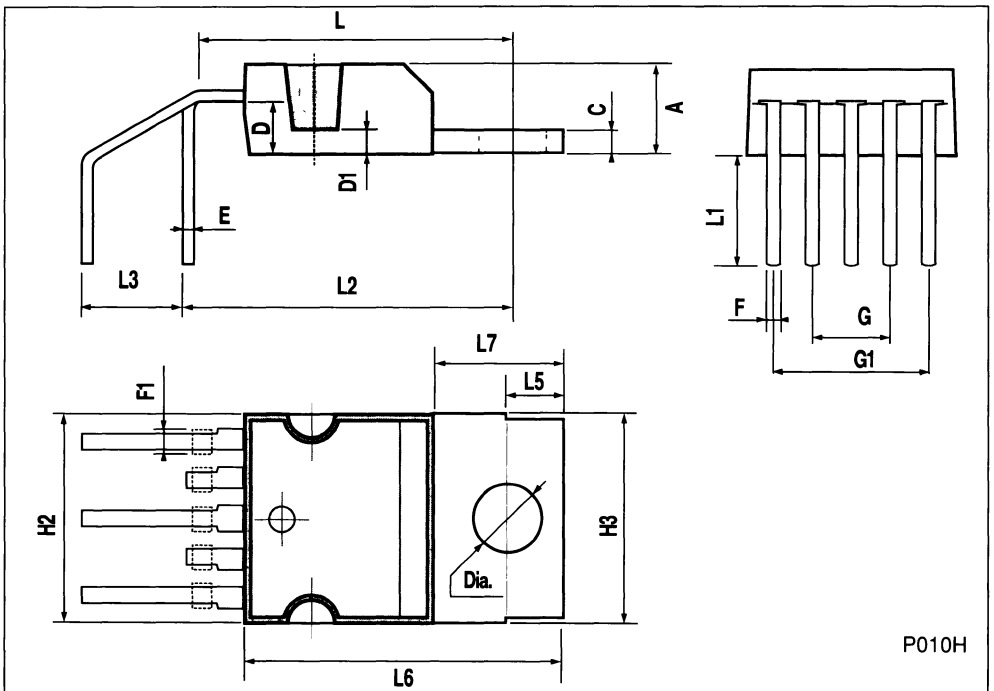
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F1	1		1.4	0.039		0.055
G	3.2	3.4	3.6	0.126	0.134	0.142
G1	6.6	6.8	7	0.260	0.268	0.276
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L	13.95	14.2	14.45	0.549	0.559	0.569
L2	14.95	15.2	15.45	0.589	0.598	0.608
L3	19.05	19.25	19.55	0.750	0.758	0.770
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
L10	6.4		6.95	0.252		0.274
Dia	3.65		3.85	0.144		0.152



P010G

**OUTLINE AND
 MECHANICAL DATA**

Pentawatt H (Short Leads)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F1	1		1.4	0.039		0.055
G	3.2	3.4	3.6	0.126	0.134	0.142
G1	6.6	6.8	7	0.260	0.268	0.276
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L	16.5		17.1	0.650		0.673
L1	3.1		3.7	0.122		0.146
L2	17.15		17.65	0.675		0.695
L3	3.6		4.2	0.142		0.165
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
Dia	3.65		3.85	0.144		0.152

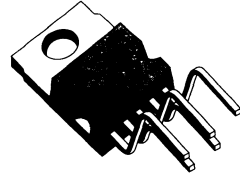


P010H

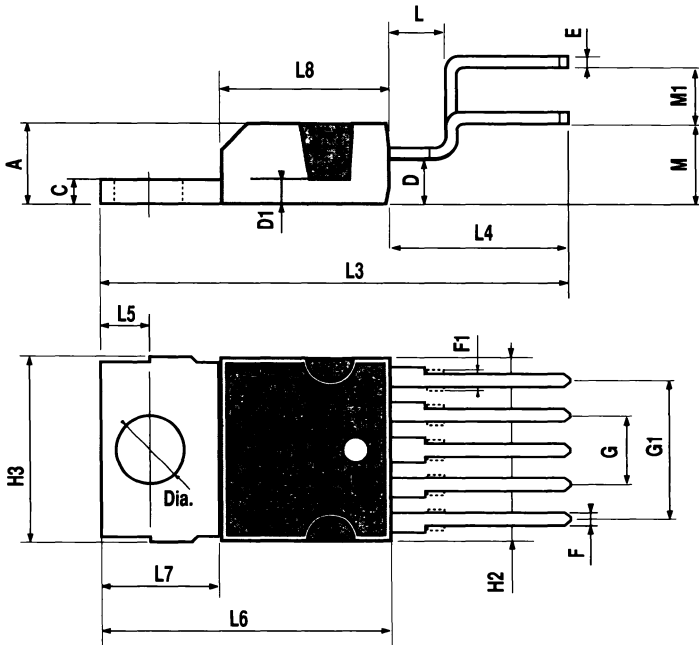
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4	4.5	4.8	0.173	0.177	0.188
C	1.2	1.27	1.37	0.047	0.050	0.053
D	2.40	2.59	2.80	0.094	0.102	0.110
D1	1.2		1.35	0.047		0.053
E	0.35	0.45	0.55	0.014	0.018	0.021
F	0.85	0.925	1	0.033	0.036	0.039
F1	1		1.4	0.039		0.055
G	3.3	3.4	3.5	0.130	0.134	0.138
G1	6.7	6.8	6.9	0.264	0.268	0.272
H2	9.2	9.8	10.4	0.362	0.385	0.409
H3	10.05	10.23	10.4	0.395	0.403	0.409
L	1.8	1.9	2.0	0.071	0.075	0.079
L3	23.68	23.86	24.03	0.932	0.939	0.944
L4	7.88	8.26	8.63	0.310	0.325	0.340
L5	2.6	2.8	3.00	0.102	0.110	0.118
L6	15.1	15.45	15.8	0.594	0.608	0.622
L7	6	6.3	6.6	0.246	0.248	0.260
L8	9.08	9.16	9.25	0.357	0.360	0.364
M	4.09	4.34	4.6	0.161	0.171	0.181
M1	2.92	3.17	3.43	0.115	0.125	0.135
Dia	3.7	3.75	3.8	0.146	0.148	0.150

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MICROELECTRONICS

**OUTLINE AND
MECHANICAL DATA**



Pentawatt V (Short Leads)

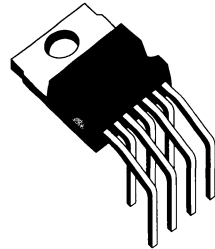


P010I

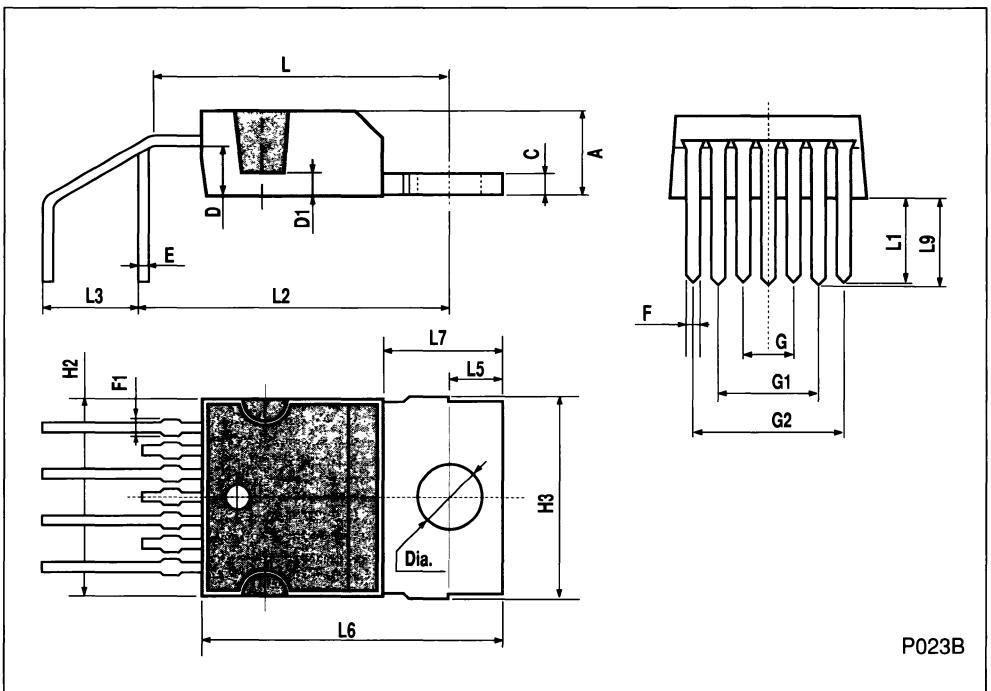
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		14.2			0.559	
L1		4.4			0.173	
L2		15.8			0.622	
L3		5.1			0.201	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
L9		4.44			0.175	
Dia	3.65		3.85	0.144		0.152

ST **SGS-THOMSON**
MICROELECTRONICS

**OUTLINE AND
MECHANICAL DATA**



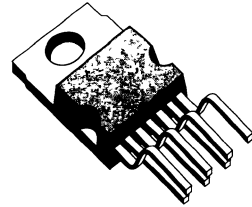
Heptawatt H



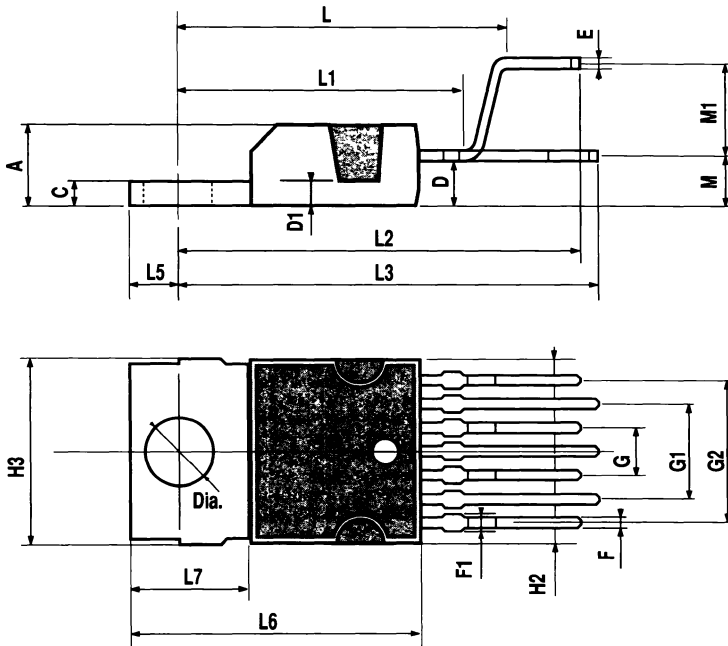
P023B

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		16.97			0.668	
L1		14.92			0.587	
L2		21.54			0.848	
L3		22.62			0.891	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		2.8			0.110	
M1		5.08			0.200	
Dia	3.65		3.85	0.144		0.152

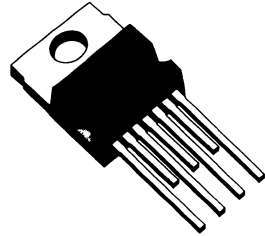
OUTLINE AND MECHANICAL DATA



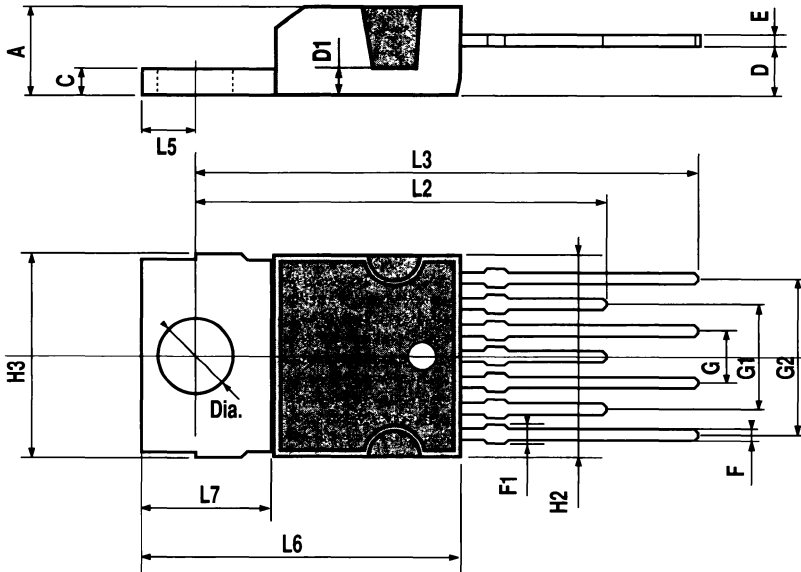
Heptawatt V



P023A

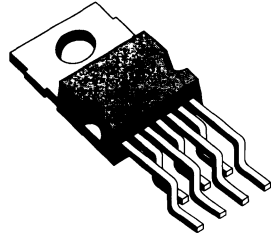
**OUTLINE AND
 MECHANICAL DATA**

Heptawatt (In-Line)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L2	22.4		22.9	0.882		0.902
L3	25.4		26	1.000		1.024
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
Dia	3.65		3.85	0.144		0.152



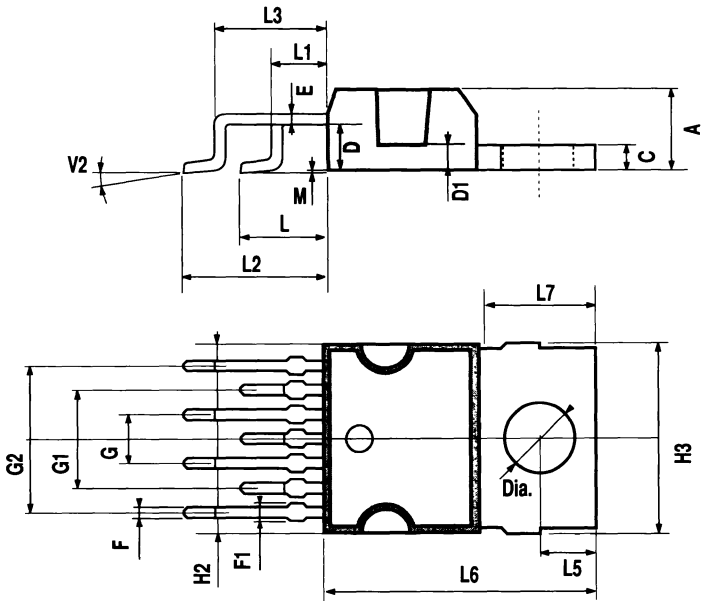
P023C

OUTLINE AND MECHANICAL DATA



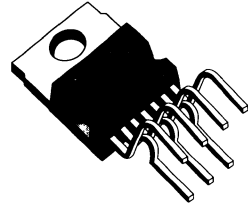
Heptawatt (Surface Mount)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2	9.2		10.4	0.362		0.409
H3	10.05		10.4	0.396		0.409
L	4.6		5.05	0.181		0.198
L1	3.9	4.1	4.3	0.153	0.161	0.170
L2	6.55	6.75	6.95	0.253	0.265	0.273
L3	5.9	6.1	6.3	0.232	0.240	0.248
L5	2.6	2.8	3	0.102	0.110	0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M	0.17		0.32	0.007		0.012
V2	8° (max.)					
Dia	3.65		3.85	0.144		0.152



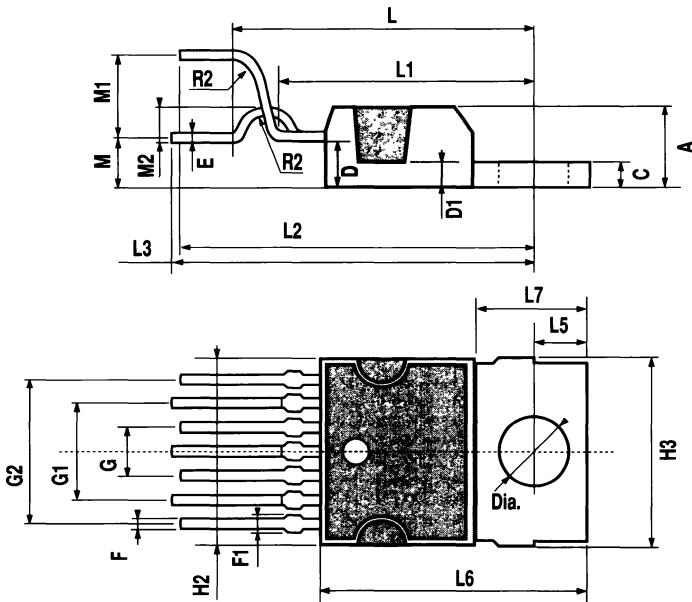
P023E

OUTLINE AND MECHANICAL DATA



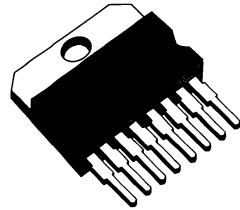
Heptawatt (Stress Relief)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L	17.2	17.4	17.6	0.677	0.685	0.693
L1		14.92			0.587	
L2	20.25	20.45	20.65	0.797	0.805	0.813
L3	20.3	20.5	20.7	0.799	0.807	0.815
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M	2.65		3	0.104		0.118
M1		5.08			0.200	
M2	1.85	2	2.1	0.073	0.079	0.083
R2	1.5	1.6	1.7	0.059	0.063	0.067
Dia	3.65		3.85	0.144		0.152



P023D

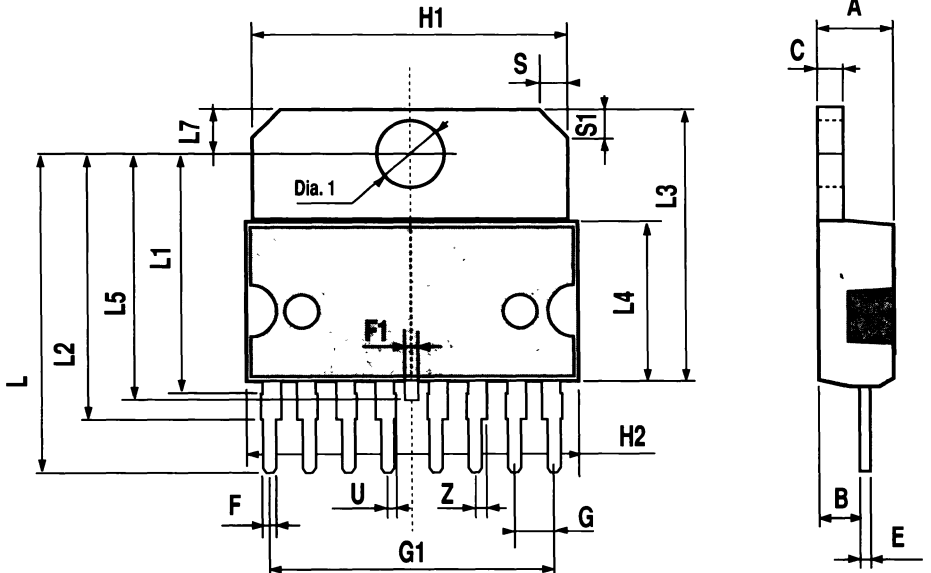
OUTLINE AND MECHANICAL DATA



Multiwatt8 (*)

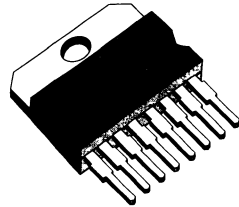
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
E	0.49		0.55	0.019		0.022
F	0.78		0.85	0.030		0.033
F1	0.68		0.75	0.027		0.029
G	2.40	2.54	2.68	0.094	0.10	0.105
G1	17.64	17.78	17.92	0.69	0.70	0.71
H1	19.6			0.772		
H2			20.2			0.795
L	20.35		20.65	0.80		0.81
L1		15.7			0.62	
L2	17.05	17.20	17.35	0.67	0.68	0.68
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L5	15.45		15.75	0.61		0.62
L7	2.65		2.9	0.104		0.114
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
U	0.40		0.55	0.015		0.022
Z	0.70		0.85	0.028		0.034
Dia1	3.65		3.85	0.144		0.152

(*) Advanced information on a new package now in development or undergoing evaluation. Details are subject to change without notice.



P017G

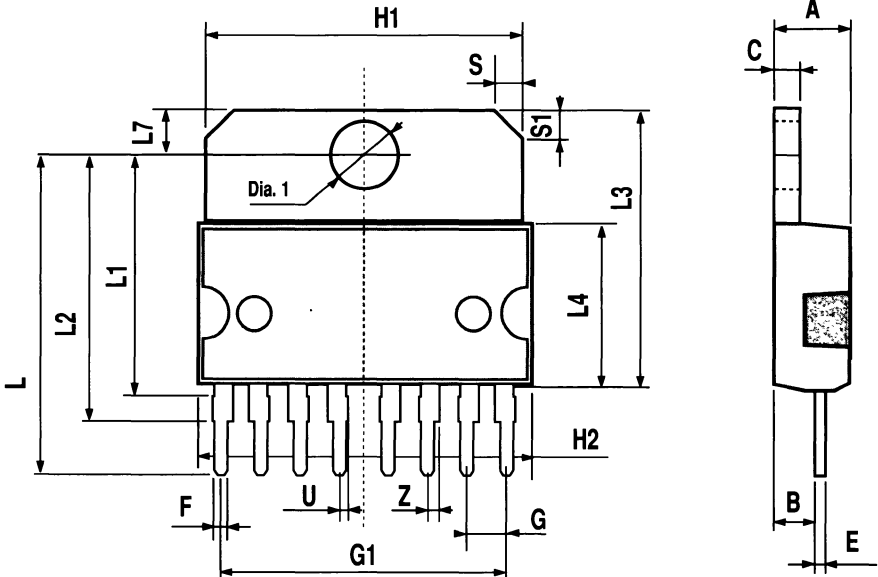
OUTLINE AND MECHANICAL DATA



Multiwatt8 (Pin. 5 Gnd) (*)

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
E	0.49		0.55	0.019		0.022
F	0.78		0.85	0.030		0.033
G	2.40	2.54	2.68	0.094	0.10	0.105
G1	17.64	17.78	17.92	0.69	0.70	0.71
H1	19.6			0.772		
H2			20.2			0.795
L	20.35		20.65	0.80		0.81
L1		15.7			0.62	
L2	17.05	17.20	17.35	0.67	0.68	0.68
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
U	0.40		0.55	0.015		0.022
Z	0.70		0.85	0.028		0.034
Dia1	3.65		3.85	0.144		0.152

(*) Advanced information on a new package now in development or undergoing evaluation. Details are subject to change without notice.

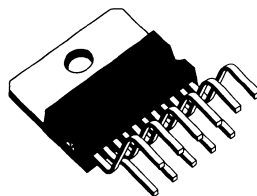


P017L

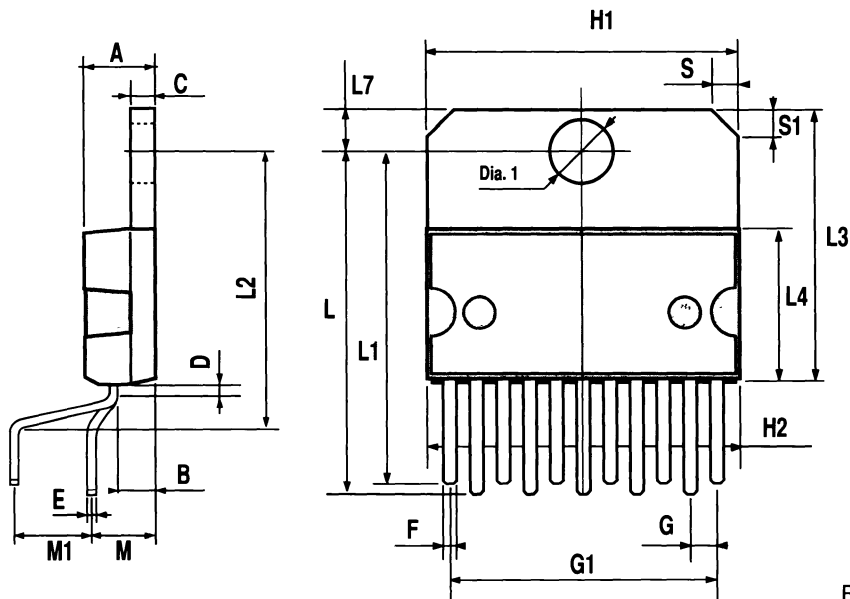
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.88		0.95	0.035		0.037
G	1.57	1.7	1.83	0.062	0.067	0.072
G1	16.87	17	17.13	0.664	0.669	0.674
H1	19.6			0.772		
H2			20.2			0.795
L	21.5		22.3	0.846		0.878
L1	21.4		22.2	0.843		0.874
L2	17.4		18.1	0.685		0.713
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
M	4.1	4.3	4.5	0.161	0.169	0.177
M1	4.88	5.08	5.3	0.192	0.200	0.209
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152

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**OUTLINE AND
MECHANICAL DATA**



Multiwatt11 V

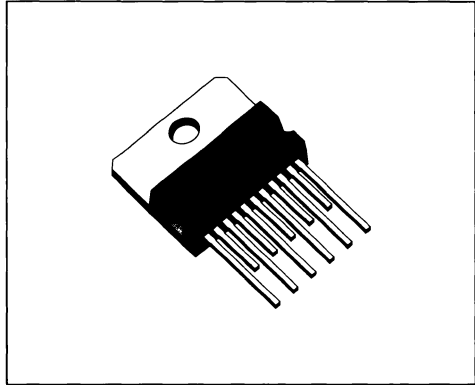


P017A

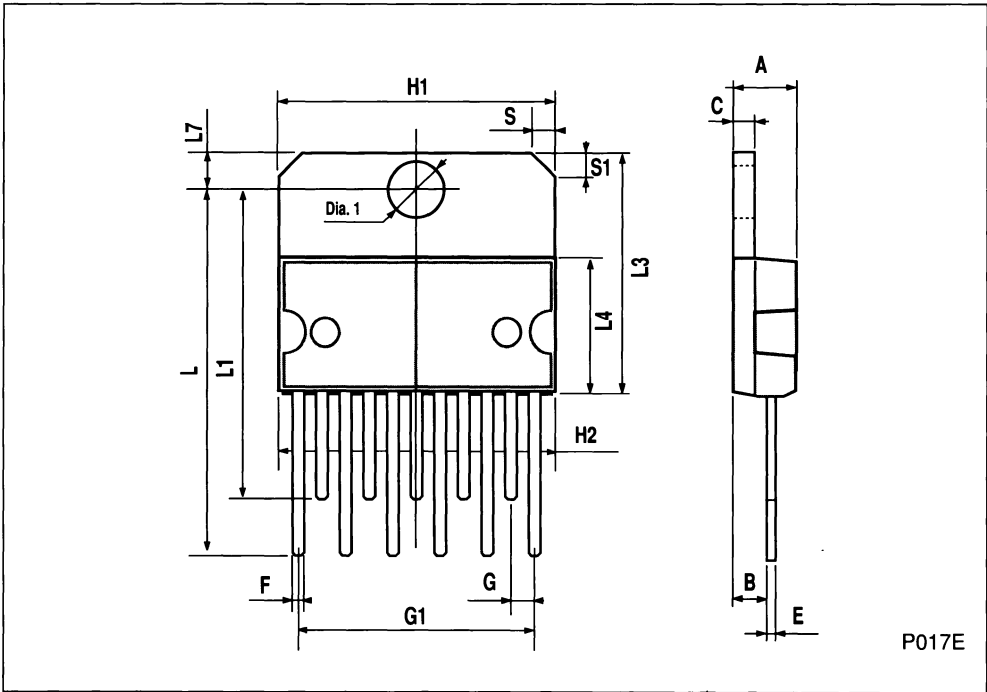
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
E	0.49		0.55	0.019		0.022
F	0.88		0.95	0.035		0.037
G	1.57	1.7	1.83	0.062	0.067	0.072
G1	16.87	17	17.13	0.664	0.669	0.674
H1	19.6			0.772		
H2			20.2			0.795
L	26.4		26.9	1.039		1.059
L1	22.35		22.85	0.880		0.900
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152



OUTLINE AND MECHANICAL DATA

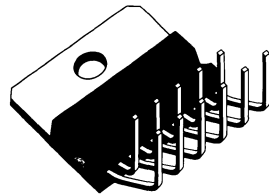


Multiwatt11 (In-Line)



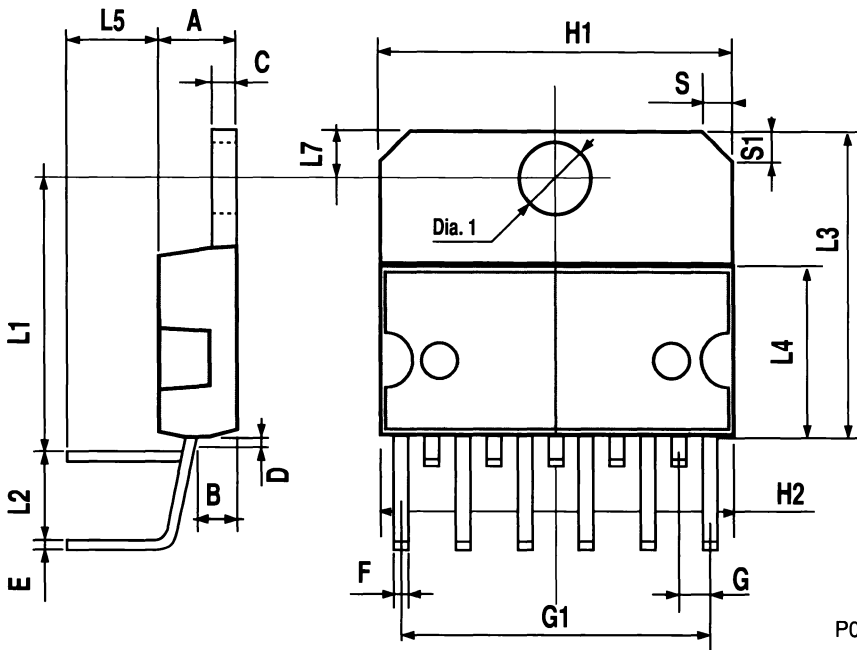
P017E

OUTLINE AND MECHANICAL DATA



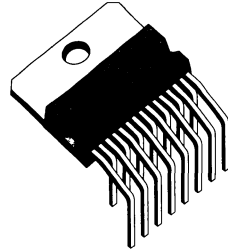
Multiwatt11 H (Up-sided)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		0.74			0.029	
E	0.49		0.55	0.019		0.022
F	0.88		0.95	0.035		0.037
G	1.57	1.7	1.83	0.062	0.067	0.072
G1	16.87	17	17.13	0.664	0.669	0.674
H1	19.6			0.772		
H2			20.2			0.795
L1		15.8			0.622	
L2		5.08			0.200	
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L5		5.3			0.209	
L7	2.65		2.9	0.104		0.114
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152



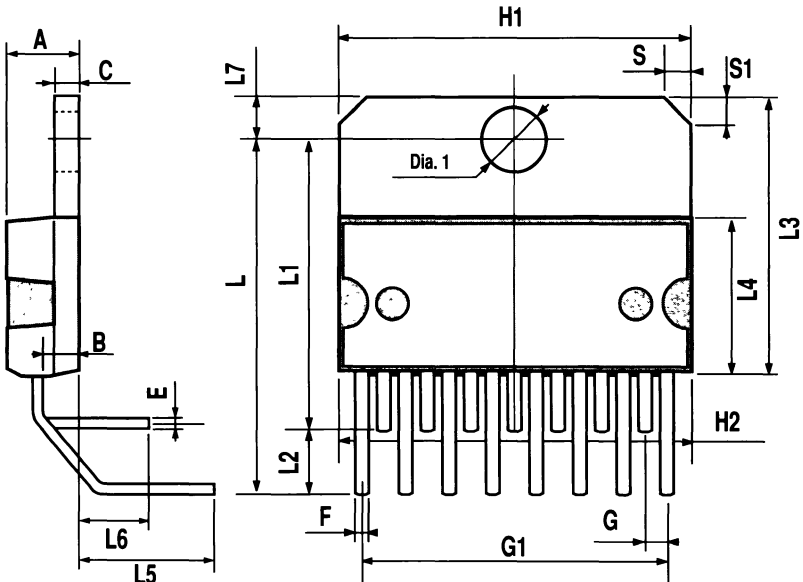
P017F

OUTLINE AND MECHANICAL DATA



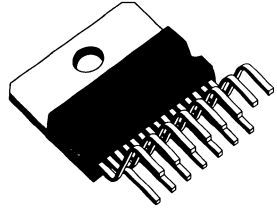
Multiwatt15 H

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L		20.57			0.810	
L1		18.03			0.710	
L2		2.54			0.100	
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L5		5.28			0.208	
L6		2.38			0.094	
L7	2.65		2.9	0.104		0.114
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152



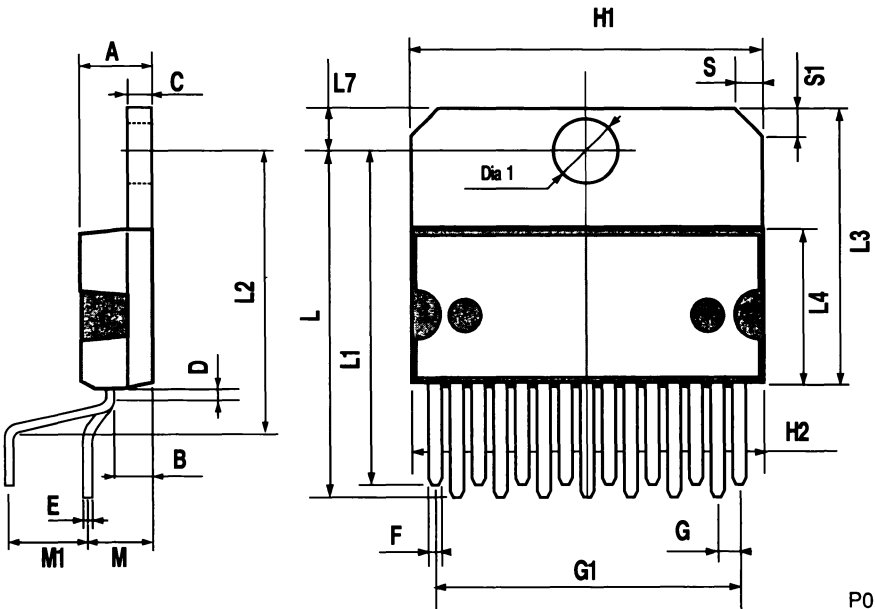
P017H

OUTLINE AND MECHANICAL DATA



Multiwatt15 V

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L	22.1		22.6	0.870		0.890
L1	22		22.5	0.866		0.886
L2	17.65		18.1	0.695		0.713
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
M	4.2	4.3	4.6	0.165	0.169	0.181
M1	4.5	5.08	5.3	0.177	0.200	0.209
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152

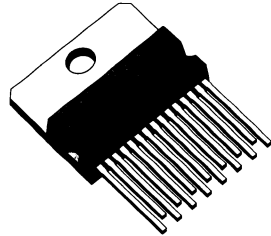


P017B

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L	26.55		27.05	1.045		1.065
L1(*)	25.35		25.8	0.998		1.016
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152

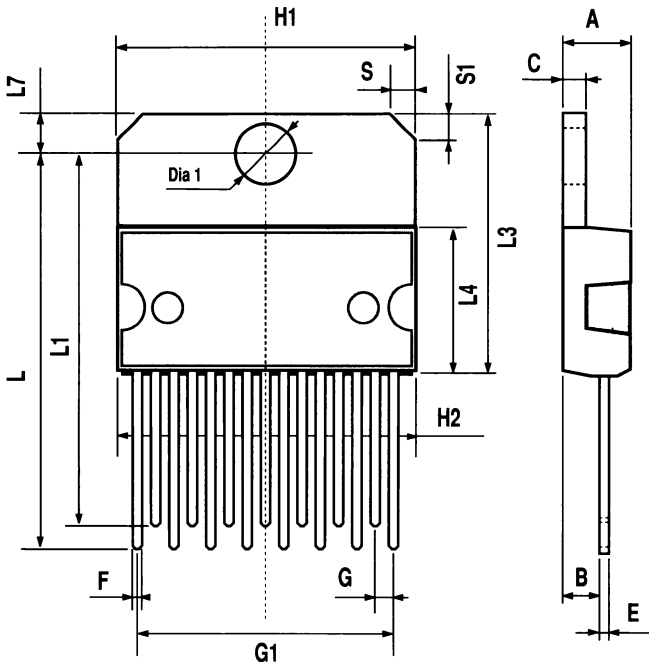


OUTLINE AND MECHANICAL DATA



Multiwatt15 (In-Line)

(*) For long Leads (22.35 min. and 22.8 max. for STD LEADS VERSION)

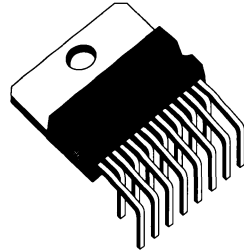


P017C

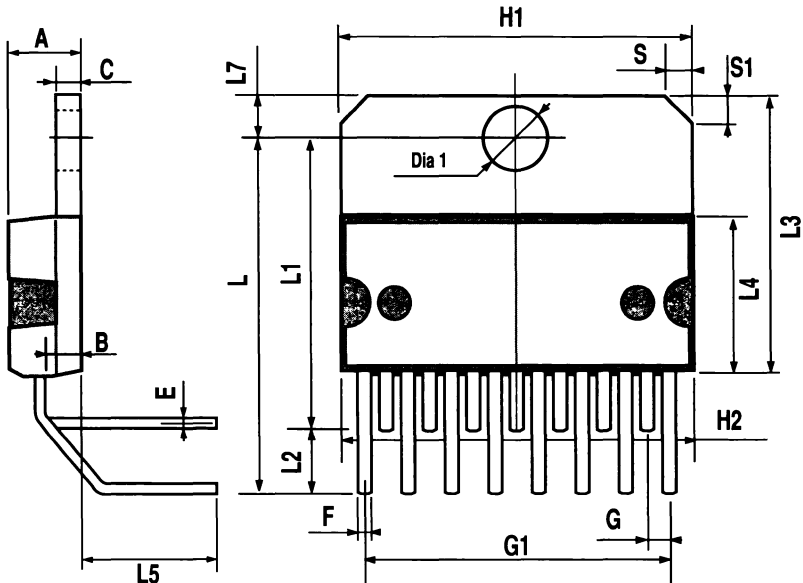
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L		20.50			0.810	
L1		18.00			0.710	
L2		2.50			0.100	
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L5		5.55			0.218	
L7	2.65		2.9	0.104		0.114
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152

ST **SGS-THOMSON**
MICROELECTRONICS

**OUTLINE AND
MECHANICAL DATA**



Multiwatt15 H (Long Leads)



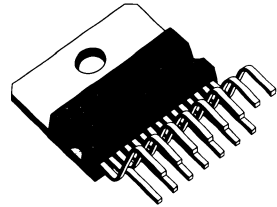
P017D

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L(1)	20.75			0.817		
L1(1)	21			0.827		
L2	17.65		18.1	0.695		0.713
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
M	4.2	4.3	4.6	0.165	0.169	0.181
M1	4.5	5.08	5.3	0.177	0.200	0.209
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia1	3.65		3.85	0.144		0.152

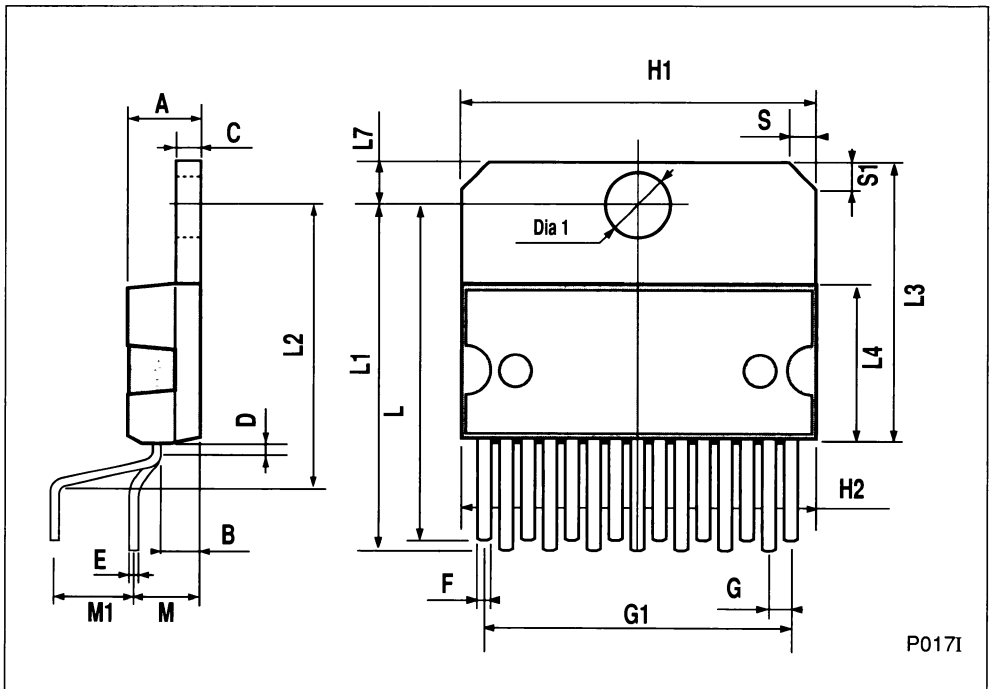
(1) L1 > L

ST **SGS-THOMSON**
MICROELECTRONICS

**OUTLINE AND
MECHANICAL DATA**

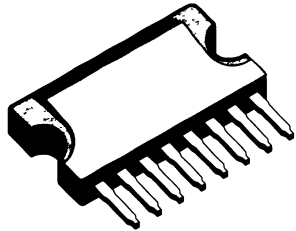


Multiwatt15 V (Short Leads)



P0171

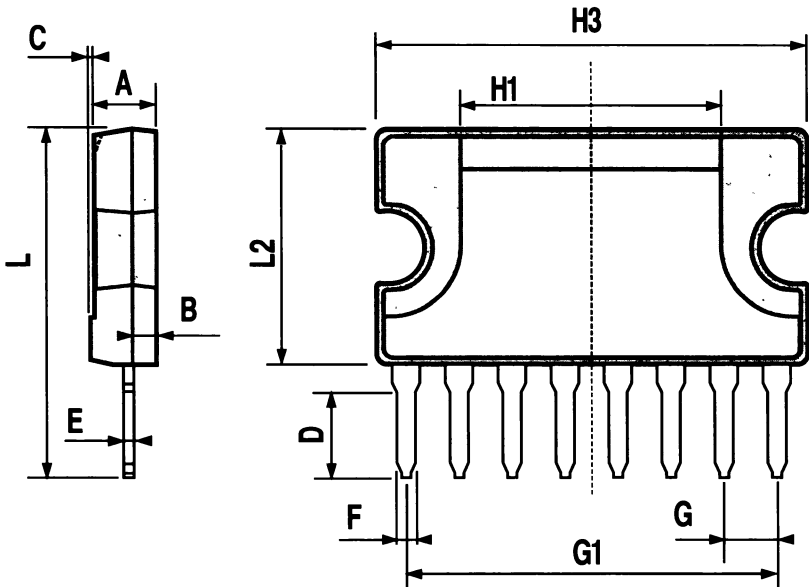
OUTLINE AND MECHANICAL DATA



Clipwatt8 (*)

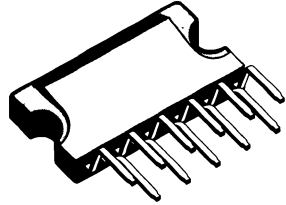
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.10			0.122
B			1.10			0.04
C		0.15			0.006	
D		3.50			0.14	
E		0.52			0.02	
F		0.80			0.03	
G		2.55			0.10	
G1		17.78			0.70	
H1		12.00			0.48	
H3		20.00			0.79	
L		15.90			0.62	
L2		11.00			0.43	

(*) Advanced information on a new package now in development or undergoing evaluation. Details are subject to change without notice.



P012A

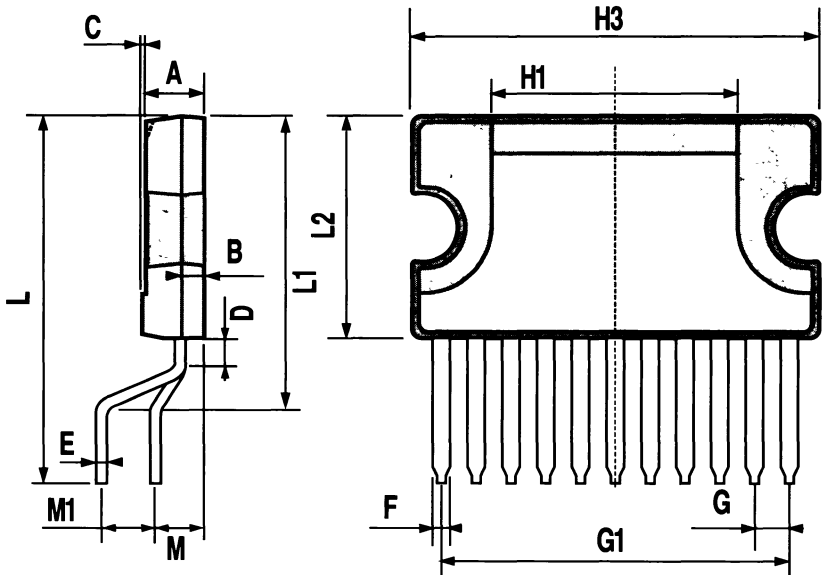
OUTLINE AND MECHANICAL DATA



Clipwatt11 (*)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.10			0.122
B			1.10			0.04
C	0.15				0.006	
D	1.50				0.059	
E	0.52				0.02	
F	0.80				0.03	
G	1.70				0.066	
G1	17.00				0.66	
H1	12.00				0.48	
H3	20.00				0.79	
L	17.90				0.70	
L1	14.40				0.57	
L2	11.00				0.43	
M	2.54				0.1	
M1	2.54				0.1	

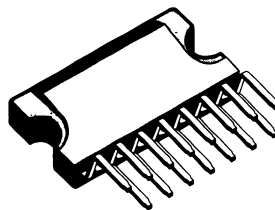
(*) Advanced information on a new package now in development or undergoing evaluation. Details are subject to change without notice



P012C

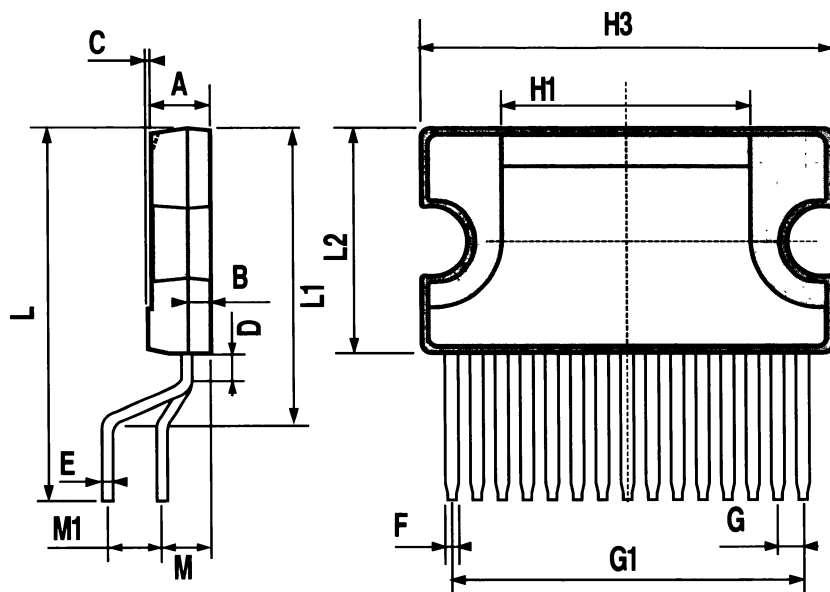
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.10			0.122
B			1.10			0.04
C		0.15			0.006	
D		1.50			0.059	
E		0.52			0.02	
F		0.70			0.027	
G		1.3			0.051	
G1		17.78			0.70	
H1		12.00			0.48	
H3		20.00			0.79	
L		17.90			0.70	
L1		14.40			0.57	
L2		11.00			0.43	
M		2.54			0.1	
M1		2.54			0.1	

OUTLINE AND MECHANICAL DATA



Clipwatt15 (*)

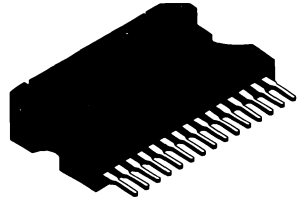
(*) Advanced information on a new package now in development or undergoing evaluation. Details are subject to change without notice.



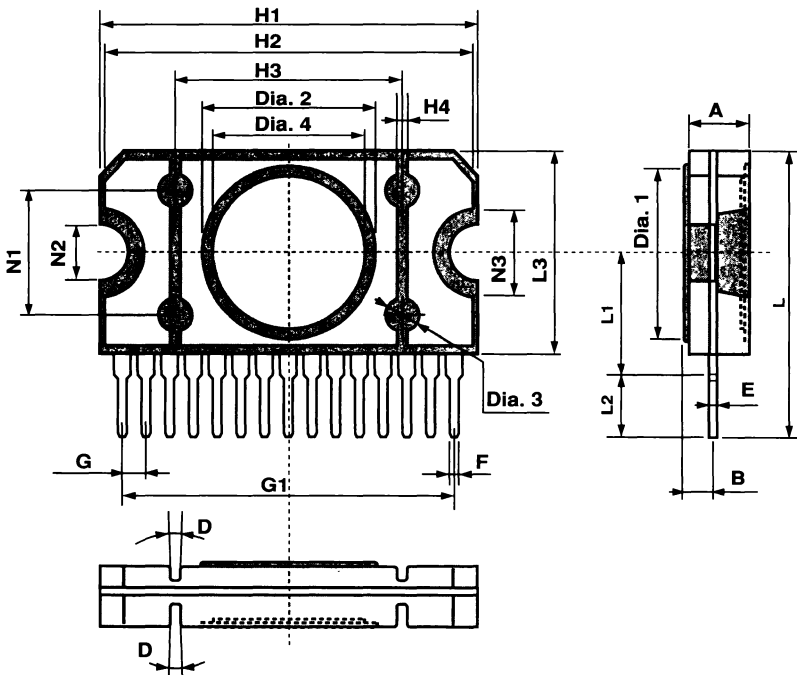
P012E

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			1.9			0.075
D	4° (typ.)					
E	0.27		0.35	0.011		0.014
F	0.83		0.97	0.033		0.038
F1	0.43		0.57	0.017		0.022
G	1.77	1.9	2.03	0.070	0.075	0.080
G1	26.45	26.7	26.95	1.041	1.051	1.061
H1	28.9		29.1	1.138		1.146
H2		28			1.102	
H3		17			0.669	
H4		0.8			0.031	
L	19.7		20.3	0.776		0.799
L1	8.8		9.4	0.346		0.370
L2	2.7		3.1	0.106		0.122
L3	15.2	15.5	15.8	0.598	0.610	0.622
N1		10			0.394	
N2		4.2			0.165	
N3		6.8			0.268	
N4		3.8			0.150	
Dia1		13			0.512	
Dia2		14			0.551	
Dia3		2.5			0.098	
Dia4		12			0.472	

OUTLINE AND MECHANICAL DATA



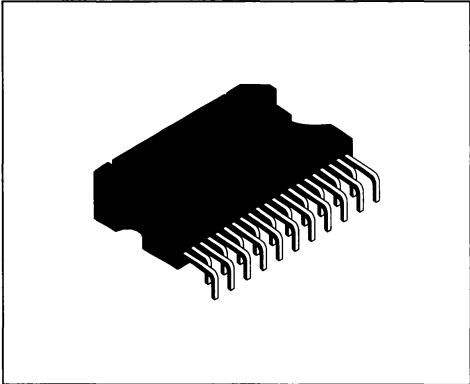
Flexiwatt15 (In-Line)



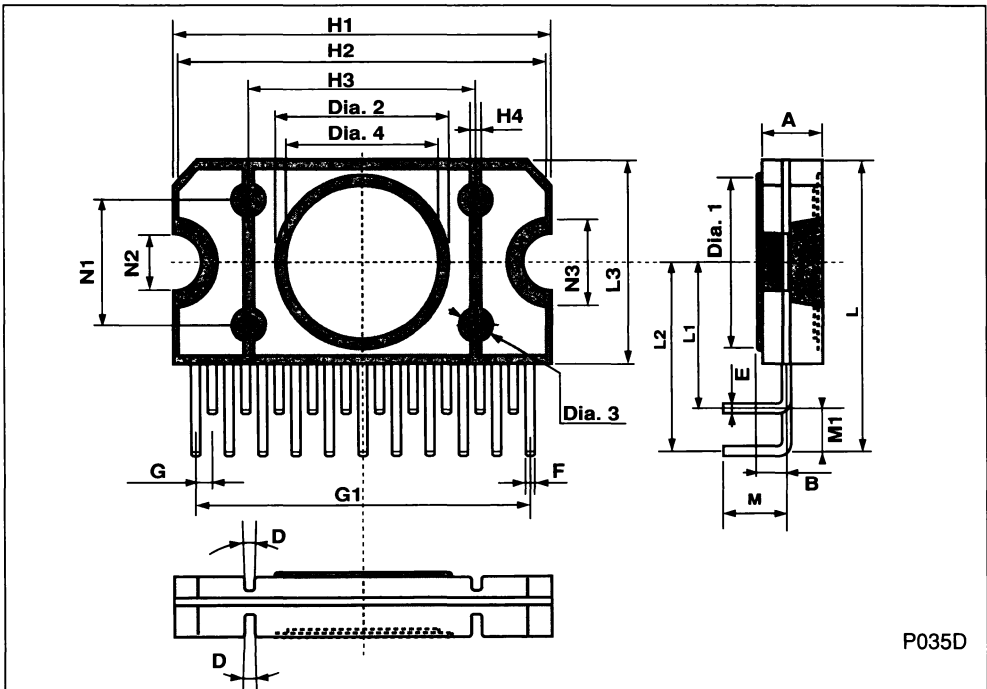
P035A

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			1.9			0.075
D	4° (typ.)					
E	0.27		0.35	0.011		0.014
F	0.65		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	25.15	25.4	25.65	0.990	1.000	1.010
H1	28.9		29.1	1.138		1.146
H2		28			1.102	
H3		17			0.669	
H4		0.8			0.031	
L	21.3		22	0.839		0.866
L1	11.4		11.8	0.449		0.465
L3	15.2	15.5	15.8	0.598	0.610	0.622
M	4.25	4.35	4.45	0.167	0.171	0.175
M1	2.2	2.54	2.85	0.087	0.100	0.112
N1		10			0.394	
N2		4.2			0.165	
N3		6.8			0.268	
N4		3.8			0.150	
Dia1		13			0.512	
Dia2		14			0.551	
Dia3		2.5			0.098	
Dia4		12			0.472	

OUTLINE AND MECHANICAL DATA



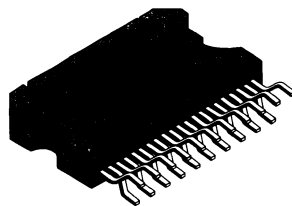
Flexiwatt21 H



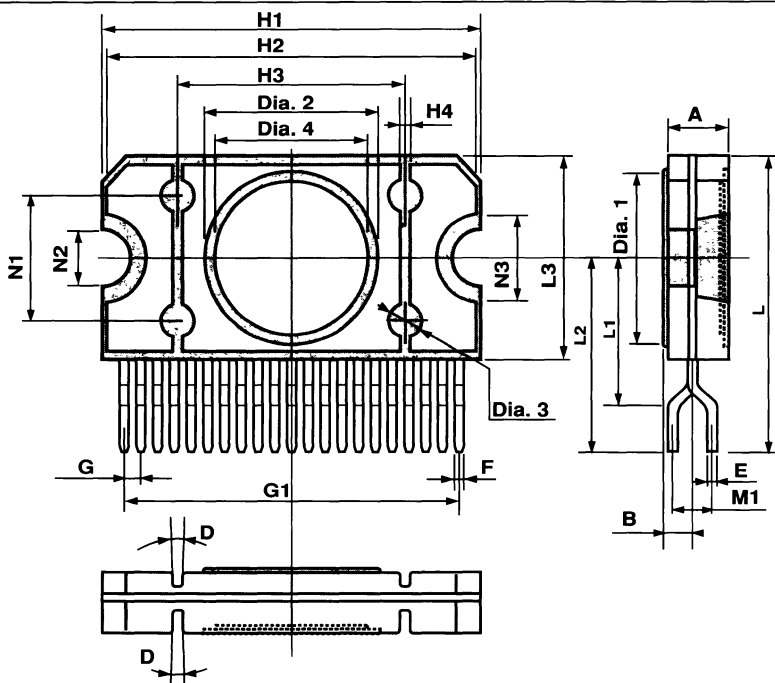
P035D

DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			1.9			0.075
D	4° (typ.)					
E	0.27		0.35	0.011		0.014
F	0.65		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	25.15	25.4	25.65	0.990	1.000	1.010
H1	28.9		29.1	1.138		1.146
H2		28			1.102	
H3		17			0.669	
H4		0.8			0.031	
L	22.4		23.0	0.881		0.905
L1	11.7		12.2	0.460		0.480
L2	14.7		15.2	0.579		0.598
L3	15.2	15.5	15.8	0.598	0.610	0.622
N1		10.0			0.393	
N2		4.2			0.165	
N3		6.8			0.268	
M1	2.2	2.54	2.85	0.087	0.1	0.112
Dia1		13.0			0.512	
Dia2		14.0			0.551	
Dia3		2.5			0.098	
Dia4		12.0			0.472	

OUTLINE AND MECHANICAL DATA

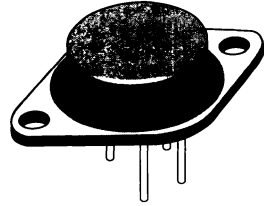


Flexiwatt21 V



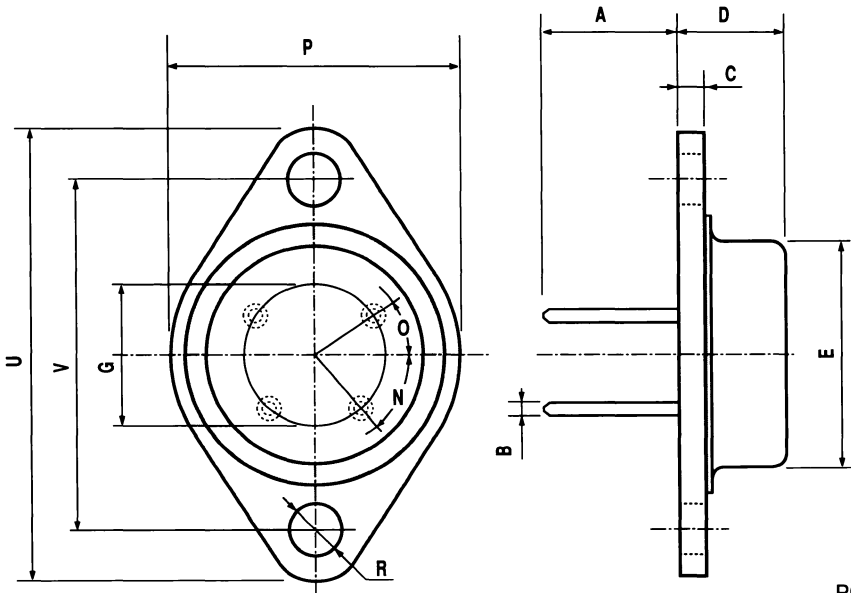
P035C

OUTLINE AND MECHANICAL DATA



TO3 (Four Leads)

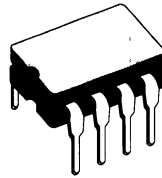
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		11.8			0.46	
B		1			0.39	
C			2.5			0.098
D			9.6			0.37
E			20			0.078
G		12.7			0.50	
N	50° (typ.)					
O	30° (typ.)					
P			26.2			1.03
R	3.88		4.20	0.15		0.16
U			39.5			1.55
V		30.1			1.18	



P003L

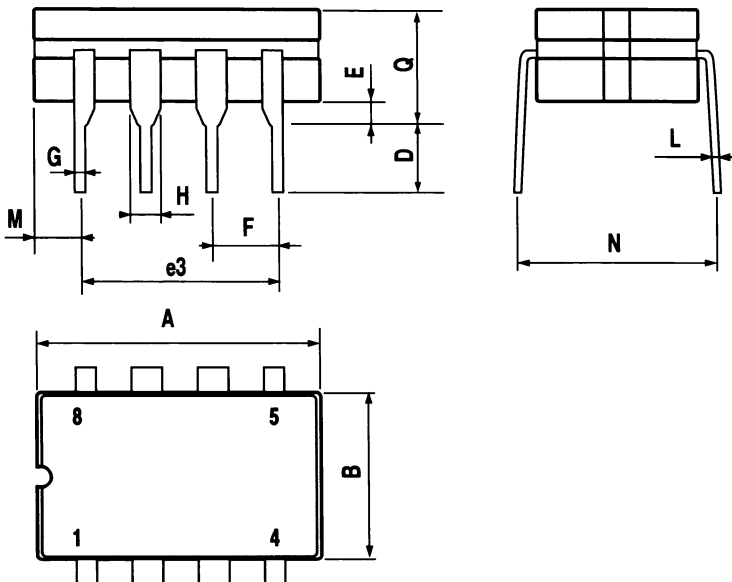
Section 2.3
CERAMIC DUAL IN-LINE PACKAGES

OUTLINE AND MECHANICAL DATA



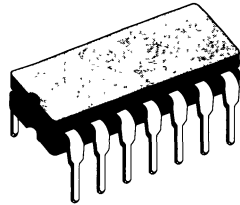
Ceramic Minidip

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			9.76			0.384
B			8			0.315
D		3.3			0.130	
E	0.5			0.020		
e3		7.62			0.300	
F		2.54			0.100	
G		0.46			0.018	
H	1.17		1.52	0.046		0.060
L		0.25			0.010	
M		1			0.039	
N			10.02			0.394
Q			5			0.197



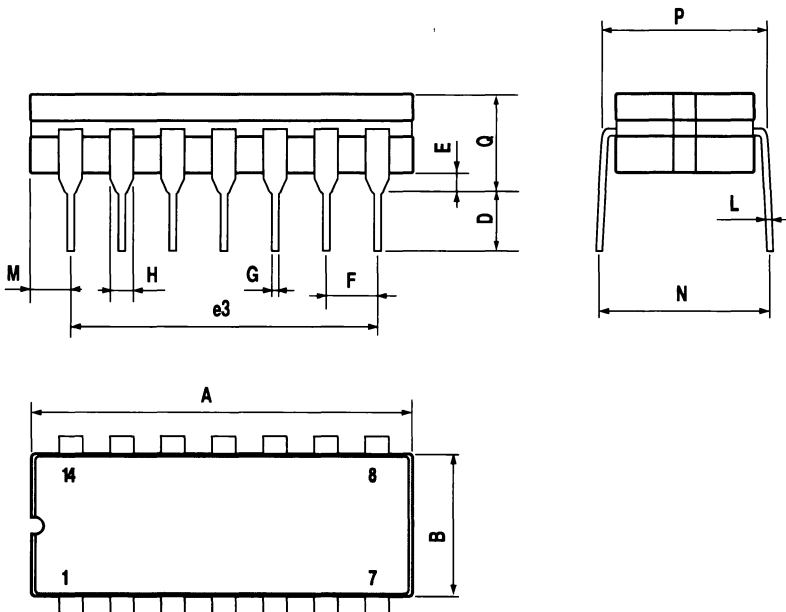
P053F

OUTLINE AND MECHANICAL DATA



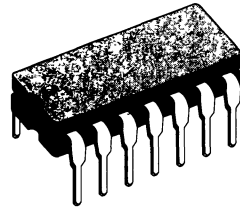
Ceramic DIP14/1

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



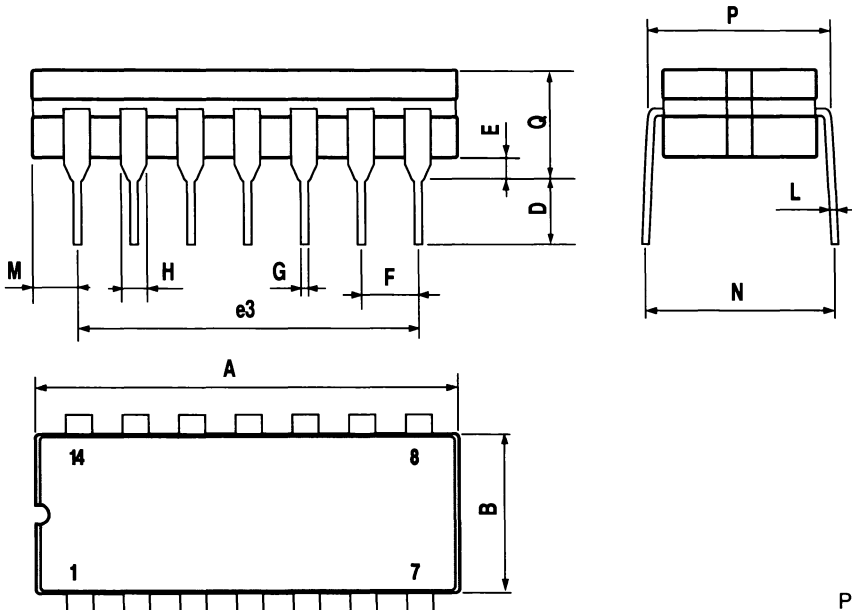
P053C

OUTLINE AND MECHANICAL DATA

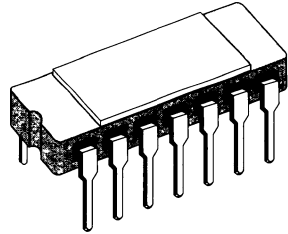


Ceramic DIP14/2

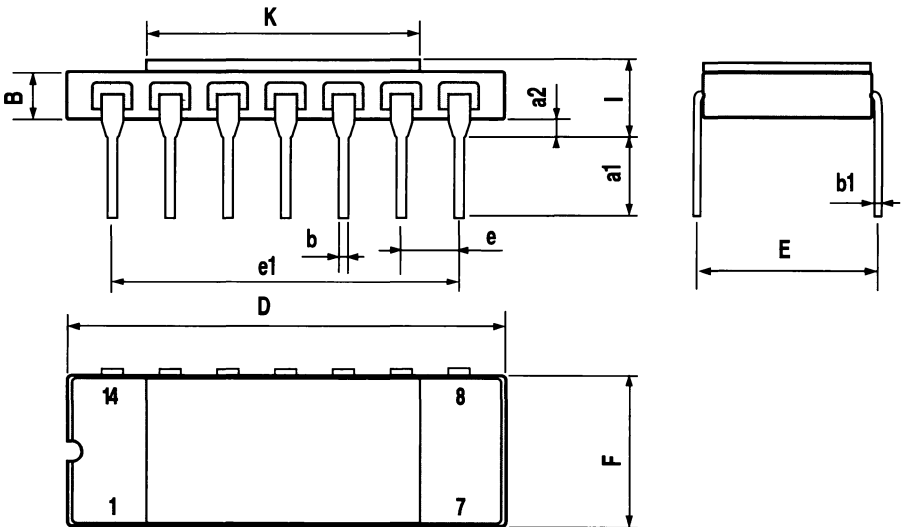
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			20			0.787
B			7.4			0.291
D		3.3			0.130	
E	0.38			0.015		
e3		15.24			0.600	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
H	1.17		1.52	0.046		0.060
L	0.22		0.31	0.009		0.012
M	1.52		2.54	0.060		0.100
N			10.3			0.406
P	7.8		8.05	0.307		0.317
Q			5.08			0.200



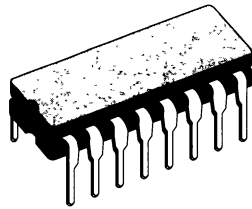
P057C

**OUTLINE AND
 MECHANICAL DATA**

Ceramic DIP14 (Side Brazed)

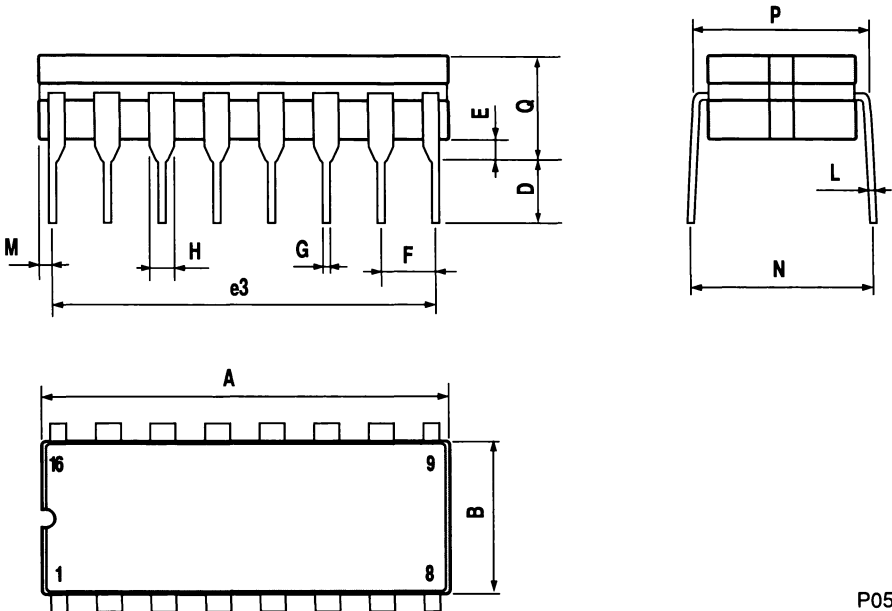
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1		3.3			0.130	
a2		0.88			0.035	
b		0.45			0.018	
b1		0.25			0.010	
D			19.2			0.756
E		7.62			0.300	
e		2.54			0.100	
e1		15.24			0.600	
F		7.36			0.290	
l			3.7			0.146
K			12.1			0.476



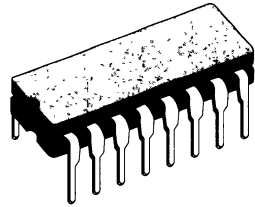
P064A

**OUTLINE AND
 MECHANICAL DATA**

Ceramic DIP16/1

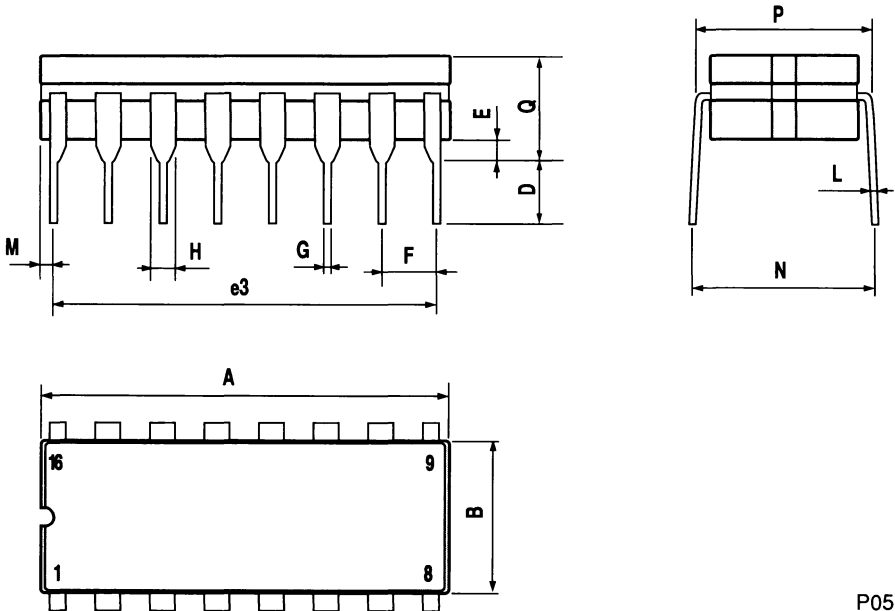
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			20			0.787
B			7			0.276
D		3.3			0.130	
E	0.38			0.015		
e3		17.78			0.700	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
H	1.17		1.52	0.046		0.060
L	0.22		0.31	0.009		0.012
M	0.51		1.27	0.020		0.050
N			10.3			0.406
P	7.8		8.05	0.307		0.317
Q			5.08			0.200



P053D

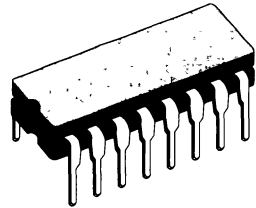
**OUTLINE AND
 MECHANICAL DATA**

Ceramic DIP16/2

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			20			0.787
B			7.4			0.291
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



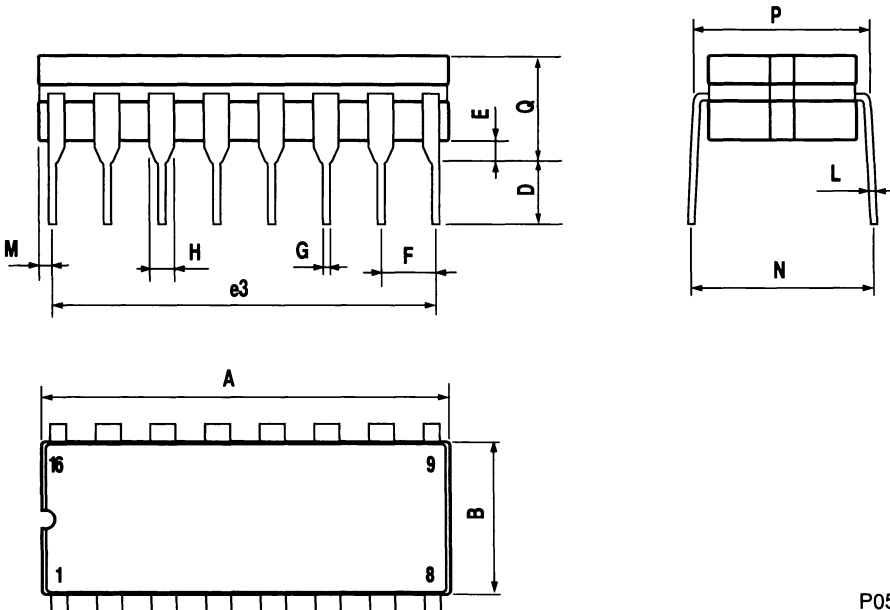
P057D

OUTLINE AND MECHANICAL DATA



Ceramic DIP16/3

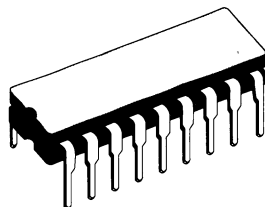
DIM.	mm			Inch		
	MIN	TYP	MAX	MIN	TYP	MAX
A			20			0.787
B			7.8			0.307
D		3.3			0.130	
E	0.38			0.015		
e3		17.78			0.700	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
H	1.17		1.6	0.046		0.063
L	0.22		0.31	0.009		0.012
M	0.51		1.27	0.020		0.050
N			10.3			0.406
P	7.9		8.13	0.311		0.320
Q			5.08			0.200



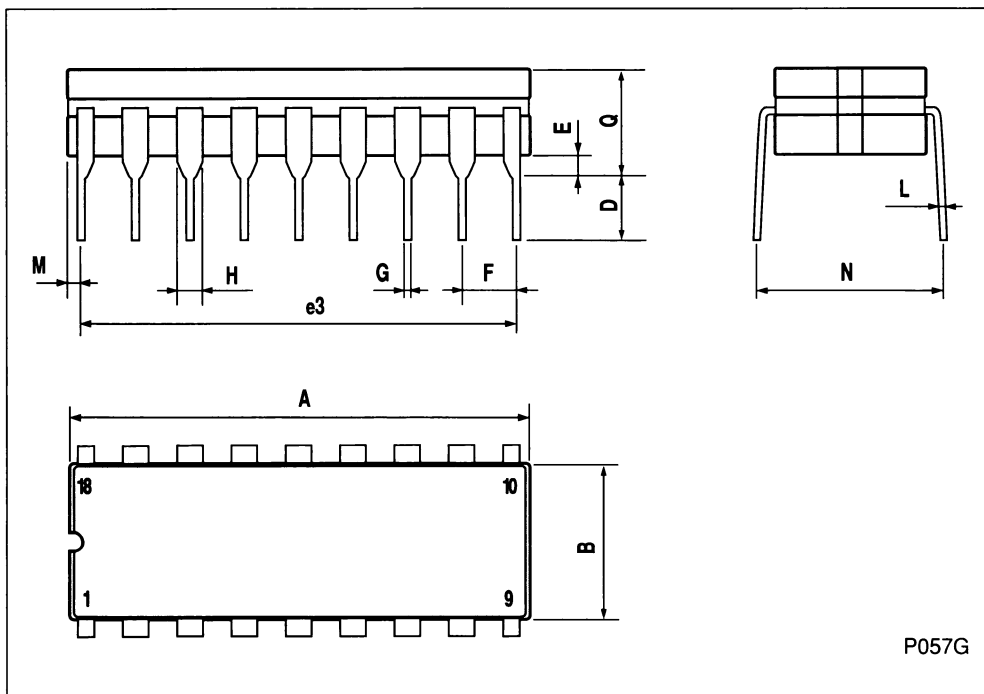
P057F

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			23.3			0.917
B			8			0.315
D		3.3			0.130	
E	0.5			0.020		
e3		20.32			0.800	
F		2.54			0.100	
G		0.46			0.018	
H	1.17		1.6	0.046		0.063
L		0.25			0.010	
N	8.95		9.52	0.352		0.375
Q			5			0.197

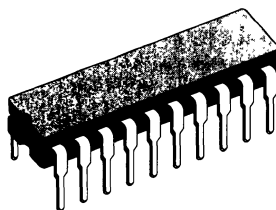
OUTLINE AND MECHANICAL DATA



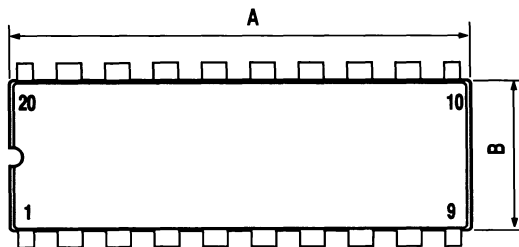
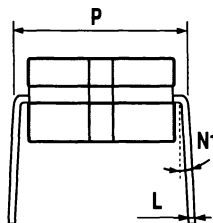
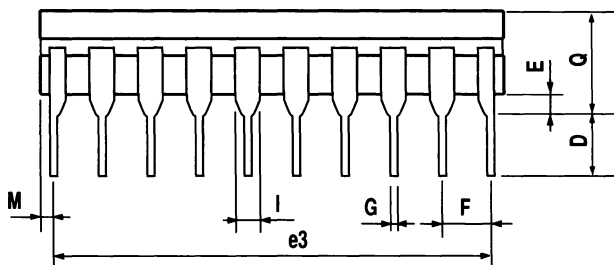
Ceramic DIP18



P057G

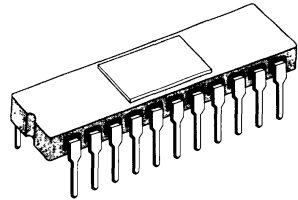
**OUTLINE AND
 MECHANICAL DATA**

Ceramic DIP20

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			25			0.984
B			7.8			0.307
D		3.3			0.130	
E	0.5		1.78	0.020		0.070
e3		22.86			0.900	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
I	1.27		1.52	0.050		0.060
L	0.22		0.31	0.009		0.012
M	0.51		1.27	0.020		0.050
N1	4°(min) , 15°(max)					
P	7.9		8.13	0.311		0.320
Q			5.71			0.225



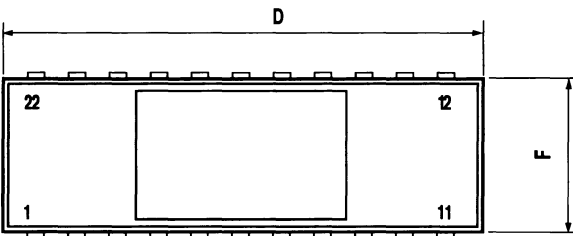
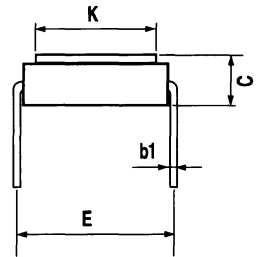
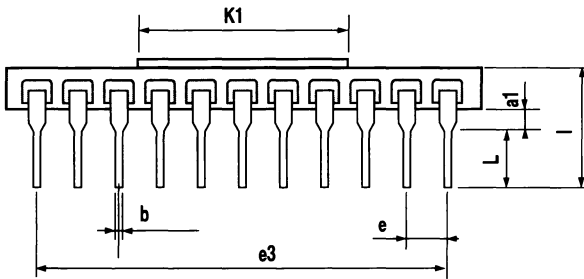
P057H

OUTLINE AND MECHANICAL DATA



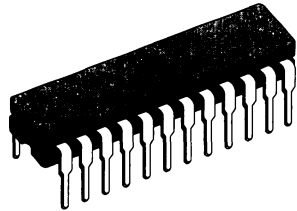
Ceramic DIP22 (Side Brazed)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1		0.96			0.038	
b		0.5			0.020	
b1		0.25			0.010	
C		1.8			0.071	
D		27.43			1.080	
E		10.16			0.400	
e		2.54			0.100	
e3		25.4			1.000	
F		9.85			0.388	
I		4.26			0.168	
L		3.3			0.130	
K			8.85			0.348
K1			11			0.433



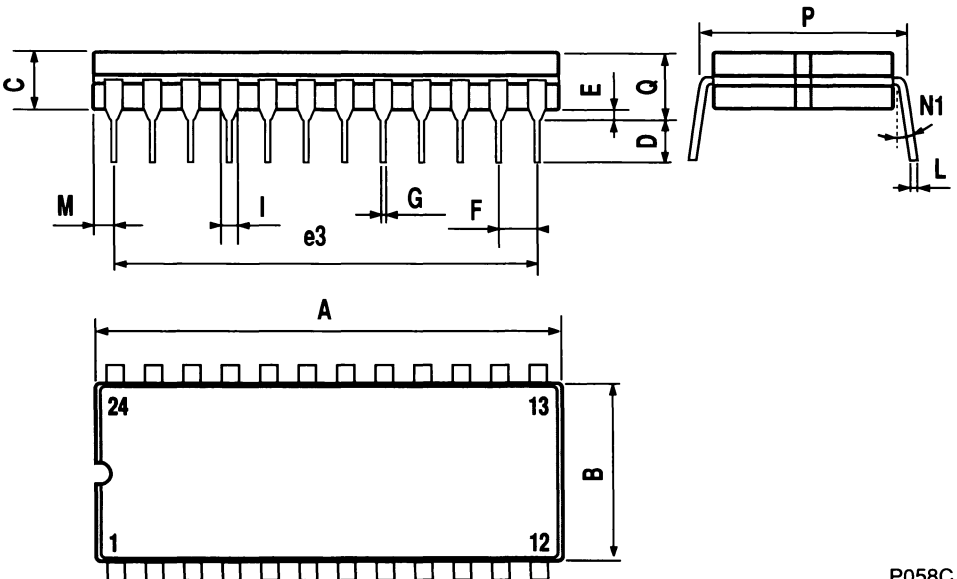
P063A

OUTLINE AND MECHANICAL DATA

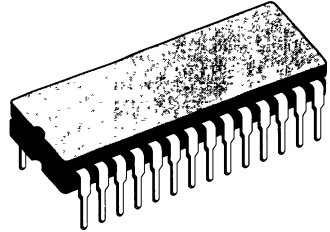


Ceramic DIP24

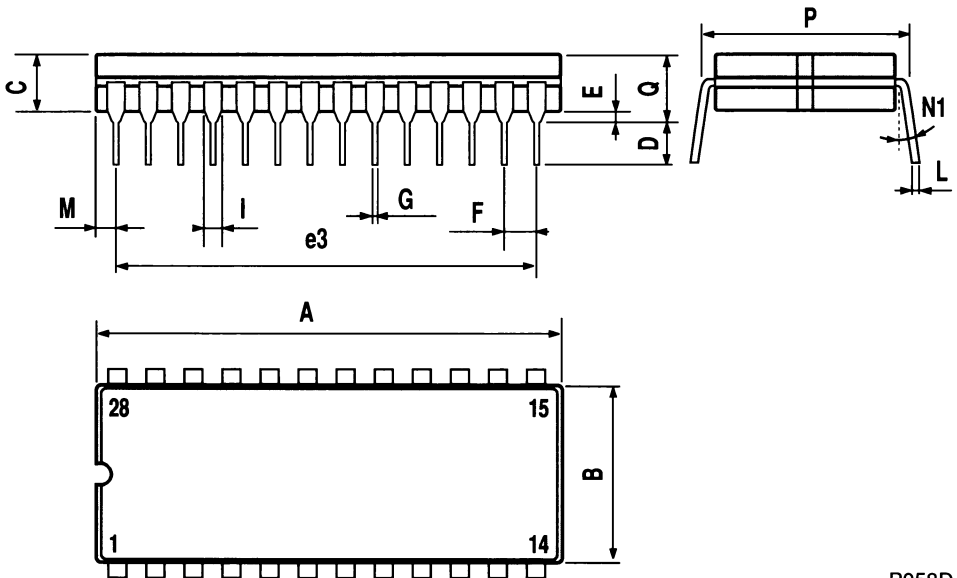
DIM.	mm			Inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			32.3			1.272
B	13.05		13.36	0.514		0.526
C	3.9		5.08	0.154		0.200
D	3			0.118		
E	0.5		1.78	0.020		0.070
e3		27.94			1.100	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
I	1.17		1.52	0.046		0.060
L	0.22		0.31	0.009		0.012
M	1.52		2.49	0.060		0.098
N1	4°(min.), 15°(max.)					
P	15.4		15.8	0.606		0.622
Q			5.71			0.225



P058C

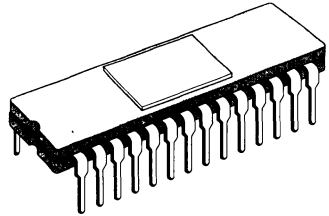
**OUTLINE AND
 MECHANICAL DATA**

Ceramic DIP28

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			38.1			1.500
B	13.05		13.36	0.514		0.526
C	3.9		5.08	0.154		0.200
D	3			0.118		
E	0.5		1.78	0.020		0.070
e3		33.02			1.300	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
I	1.17		1.42	0.046		0.056
L	0.22		0.31	0.009		0.012
M	1.52		2.49	0.060		0.098
N1	4°(min), 15°(max)					
P	15.4		15.8	0.606		0.622
Q			5.71			0.225



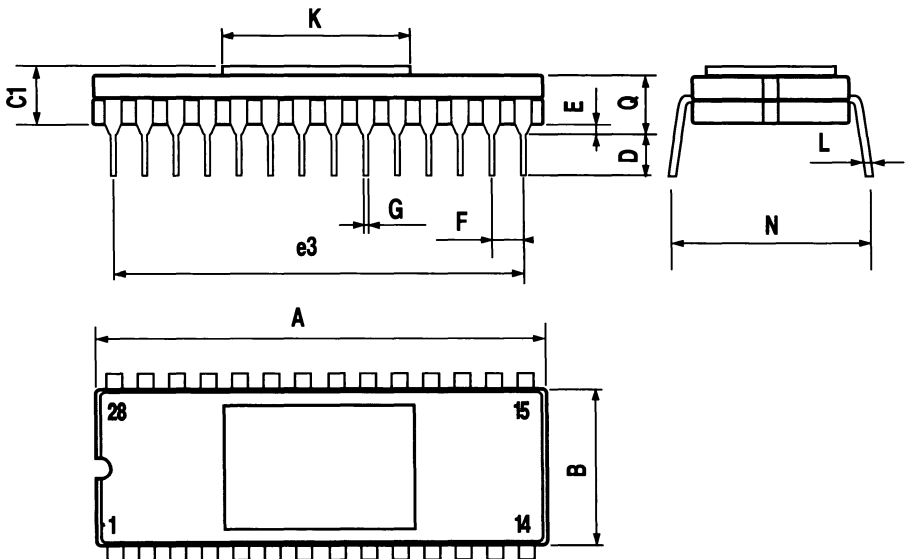
P058D

OUTLINE AND MECHANICAL DATA



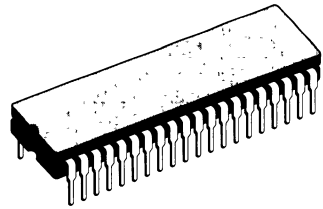
Ceramic DIP28 (Epoxy Seal)

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			37.3			1.469
B			13.4			0.528
C1			5			0.197
D		3.6			0.142	
E	0.5			0.020		
e3		33.02			1.300	
F		2.54			0.100	
G		0.46			0.018	
L		0.25			0.010	
N			18.6			0.732
Q			5			0.197
K			17.2			0.677



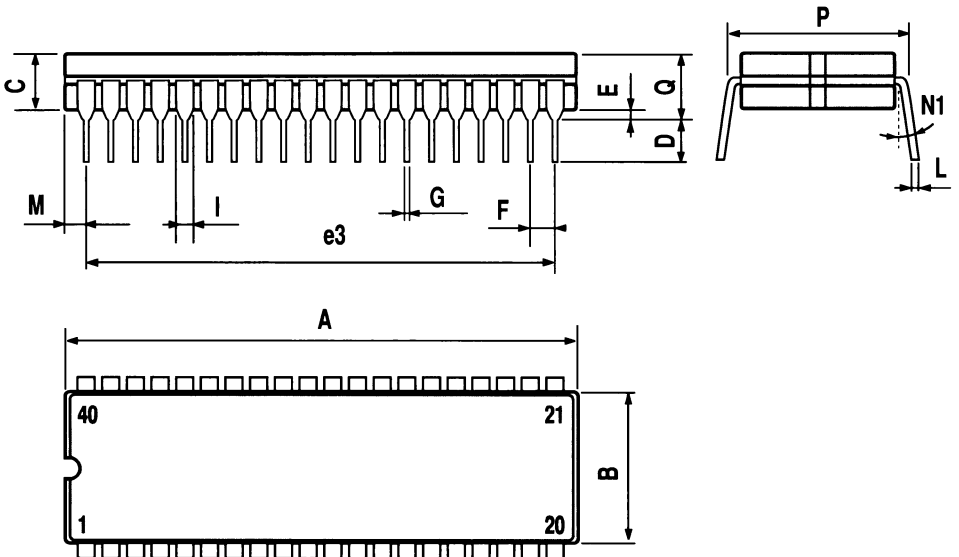
P058N

OUTLINE AND MECHANICAL DATA



Ceramic DIP40

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			53.4			2.102
B	14.5		14.9	0.571		0.587
C	3.9		5.08	0.154		0.200
D	3.0			0.118		
E	0.5		1.78	0.020		0.070
e3		48.26			1.900	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
I	1.17		1.52	0.046		0.060
L	0.22		0.31	0.009		0.012
M	1.52		2.49	0.060		0.098
N1	4°(min.), 15°(max)					
P	15.4		15.8	0.606		0.622
Q			5.71			0.225



P058R

Section 3.0

PACKING

SHIPPING TUBES AND TAPE & REEL PACKING

The development in the field of electronic components is advancing at a terrific pace: the packing density is increasing greatly, the components are becoming more and more valuable and the sensitivity to external potentials is increasing enormously.

This makes an effective protection against destructive influences by static charges and discharges essential. Packages of conductive plastics are thus one of the most important elements in the production, testing, transport and processing of modern components in the electronics industry.

With ICs in particular, packing tubes have proved to be an effective protection for the sensitive pins which are otherwise apt to bend and deform.

Matching stoppers for all types of tubes are also supplied (see pag. 121).

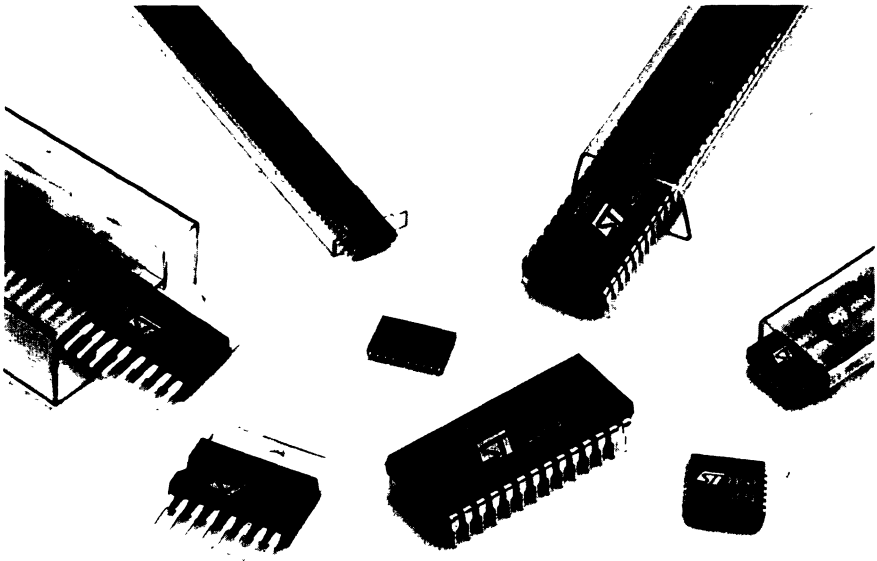
For Tape & Reel Packing the more important dimensions for PLCC and SO packages are specified (pag.122) in conformity to the regulations by Electronic Industry Association (EIA 481-A).

Shipping Tubes

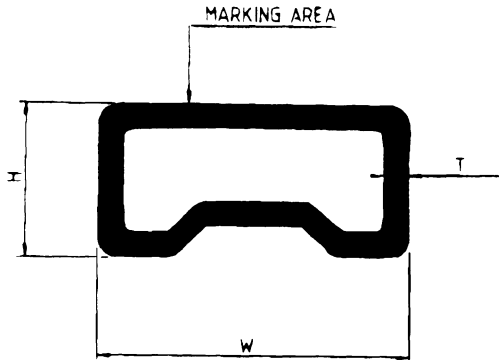
- Material: PVC transparent, antistatic, neutral color
- Length of tubes = 532 mm
- All printing process Blue color
- All tolerances for position of LOGO and ANTISTATIC marking = ± 0.5 mm
- Guaranteed no flashes (both internal or external) on the hole or tips

Tape & Reel

- Reel: plastic conductive
- Cavity Tape: Black Conductive (less than 10^5 ohms per square)
- Cover Tape: Transparent antistatic (less than 10^{10} ohms per square)



**SHIPPING TUBE FOR
SO8 - SO14 - SO16**

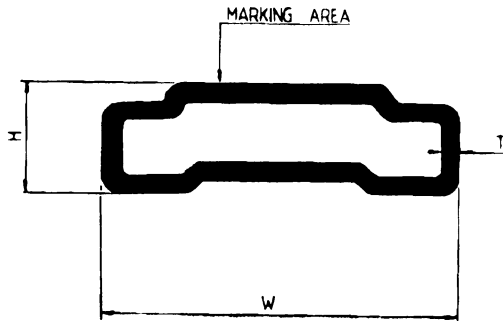


TUBE DIMENSIONS (mm)				QUANTITY per TUBE	
H	W	T	LENGHT	PACKAGE	NUMBER
3.80	7.80	0.60	532	8 14 - 16	100 50

Marking:



**SHIPPING TUBE FOR
WIDE SO16 - SO20 - SO28**

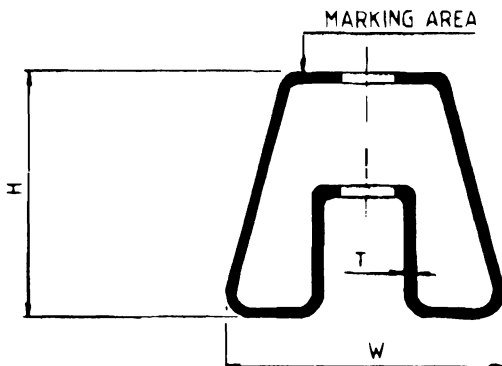


TUBE DIMENSIONS (mm)				QUANTITY per TUBE	
H	W	T	LENGHT	PACKAGE	NUMBER
4.70	15.00	0.80	532	16 20 28	50 40 28

Marking:



**SHIPPING TUBE
FOR PLASTIC DIP**

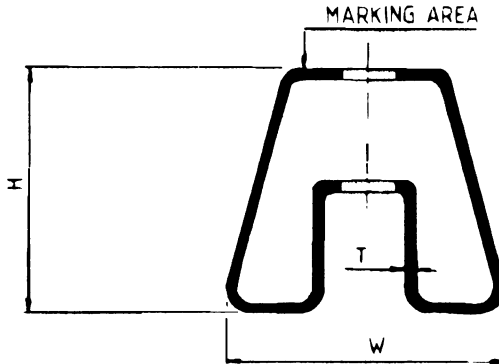


PACKAGE	TUBE DIMENSIONS (mm)				QUANTITY per TUBE	
	H	W	T	LENGHT	PACKAGE	NUMBER
.300" (7.62)	11.20	15.00	0.80	532	8	50
					14 - 16	25
					18 - 20	20
					24	20
					24 - Shrink	20
.400" (10.16)	12.70	18.60	0.80	532	30 - Shrink	15
.600" (15.24)	11.90	22.50	0.80	532	24	15
					28	13
					40	9
					42 - Shrink	13
					48	8

Marking:



**SHIPPING TUBE
FOR CERAMIC DIP**

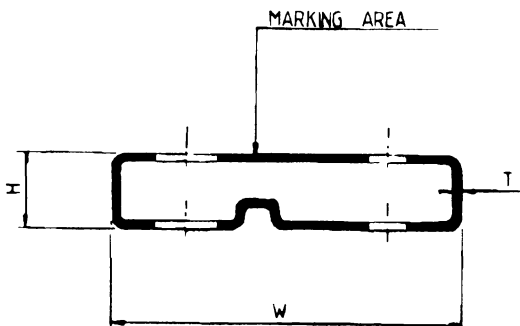


PACKAGE	TUBE DIMENSIONS (mm)				QUANTITY per TUBE	
	H	W	T	LENGHT	PACKAGE	NUMBER
.300" (7.62)	13.40	15.20	0.60	532	8	50
					14 - 16	25
					18 - 20	20
					24	15
.400" (10.16)	12.70	18.60	0.80	532	22	17
.600" (15.24)	11.90	22.50	0.80	532	24	15
					28	13
					40	9
					48	8

Marking:



**TO220
SHIPPING TUBE**

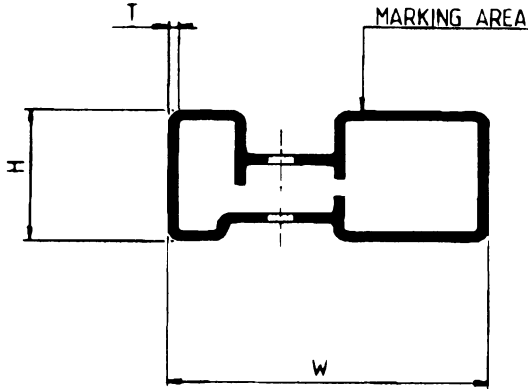


TUBE DIMENSIONS (mm)				QUANTITY per TUBE
H	W	T	LENGHT	NUMBER
6.98	32.88	0.75	532	50

Marking:



**HEPTAWATT AND PENTAWATT
SHIPPING TUBE**

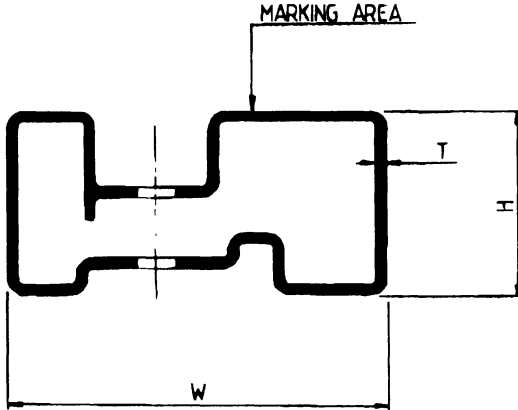


TUBE DIMENSIONS (mm)				QUANTITY per TUBE
H	W	T	LENGHT	NUMBER
14.10	34.10	1.00	532	50

Marking:



**MULTIWATT
SHIPPING TUBE**

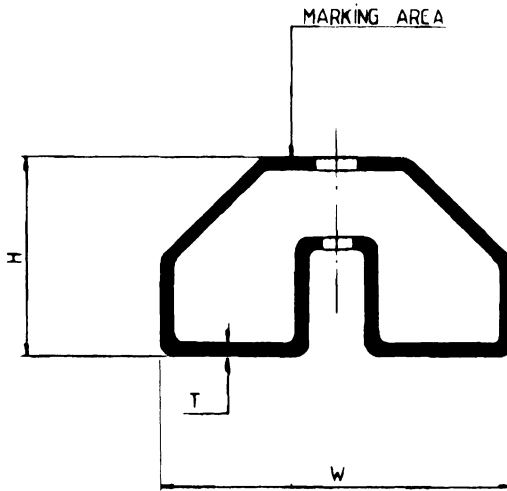


TUBE DIMENSIONS (mm)				QUANTITY per TUBE
H	W	T	LENGHT	NUMBER
16.00	34.00	1.00	532	25

Marking:



**FIN DIP
SHIPPING TUBE**

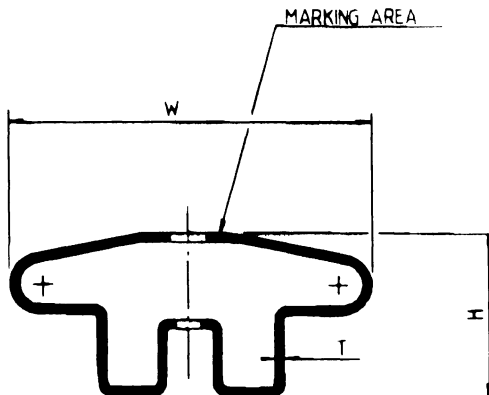


TUBE DIMENSIONS (mm)				QUANTITY per TUBE
H	W	T	LENGHT	NUMBER
12.25	21.30	0.70	532	25

Marking:



**FIN DIP (WITH HOLES)
SHIPPING TUBE**

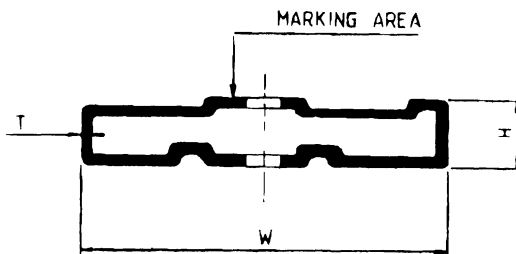


OPTION	TUBE DIMENSIONS (mm)				QUANTITY per TUBE NUMBER
	H	W	T	LENGHT	
OPTION A	11.70	28.70	0.70	532	25
OPTION B	12.35	28.70	0.70	532	25

Marking:



**SIP
SHIPPING TUBE**

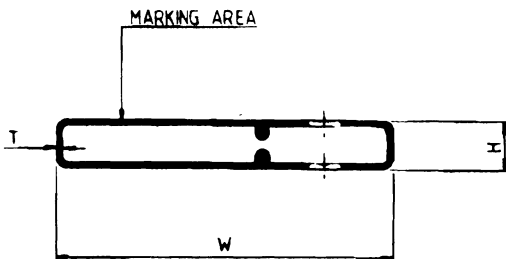


TUBE DIMENSIONS (mm)				QUANTITY per TUBE	
H	W	T	LENGHT	PACKAGE	NUMBER
5.55	28.90	0.80	532	SIP9 - SIP10	20

Marking:



**SOT32 AND SOT82
SHIPPING TUBE**

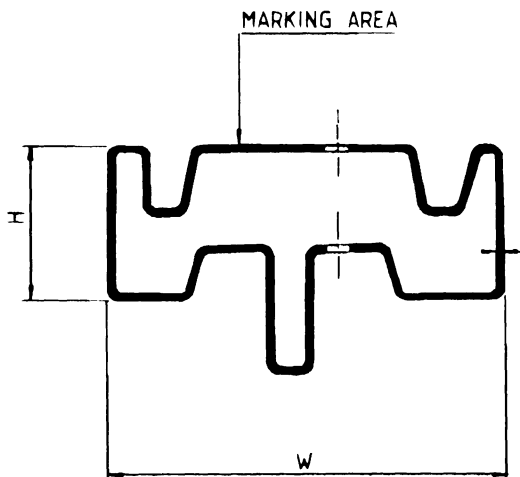


TUBE DIMENSIONS (mm)				QUANTITY per TUBE
H	W	T	LENGHT	NUMBER
5.00	34.30	0.65	532	50

Marking:



**TO3
SHIPPING TUBE**

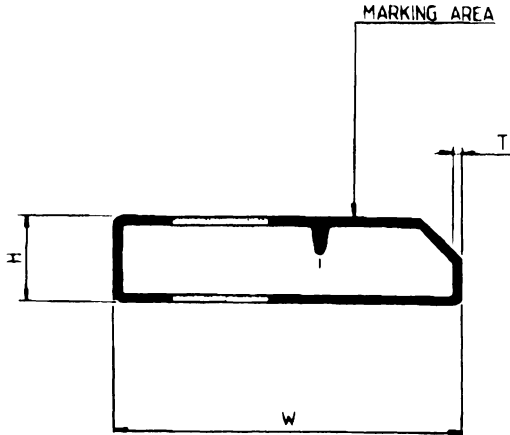


TUBE DIMENSIONS (mm)				QUANTITY per TUBE
H	W	T	LENGHT	NUMBER
25.00	43.00	0.60	532	20

Marking:



**FLEXIWATT (IN LINE)
SHIPPING TUBE**

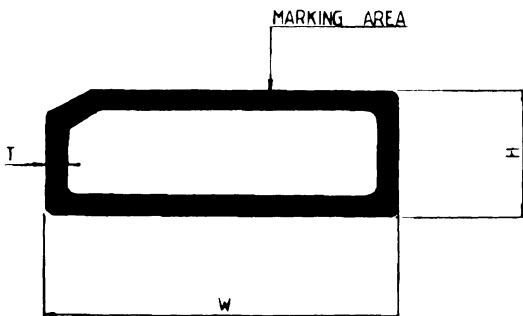


TUBE DIMENSIONS (mm)				QUANTITY per TUBE
H	W	T	LENGHT	NUMBER
6.70	29.00	0.70	532	17

Marking:



**PLCC20 TO PLCC68
SHIPPING TUBE**

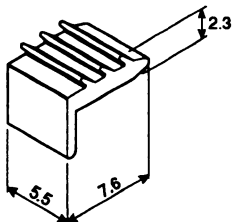


PACKAGE	TUBE DIMENSIONS (mm)				
	H	W	T	LENGHT	NUMBER
20	7.50	12.60	1.10	532	50
28	7.50	15.70	1.10	532	40
44	7.50	20.70	1.10	532	28
52	7.50	23.20	1.10	532	25
68	7.50	28.20	1.10	532	20

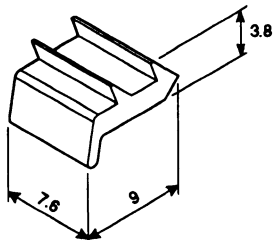
Marking:



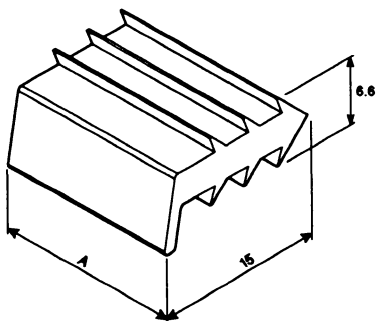
STOPPERS FOR SHIPPING TUBES



SO8 - SO14 - SO16

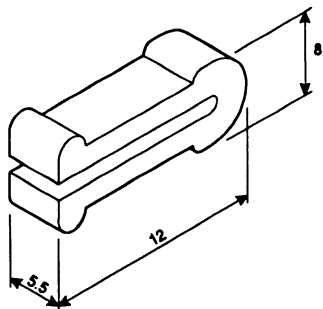


SO16L - SO20 - SO28

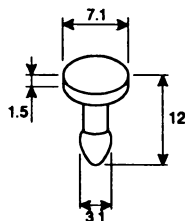


PLCC20 - PLCC28 - PLCC44 - PLCC52 - PLCC68

Type	PLCC20 PLCC28	PLCC44 PLCC52	PLCC68
A (mm)	8.5	17.5	24.5



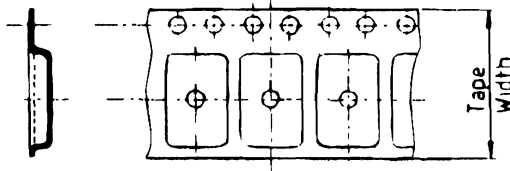
FLEXIWATT



STANDARD (NAIL)

Stoppers material: Elastomer

TAPE AND REEL PACKING



PACKAGE	TAPE WIDTH (mm)	REEL DIAMETER (mm)	QUANTITY per REEL
SO8	12	330	2500
SO14	16	330	2500
SO16	16	330	2500
SO16L	16	330	2000
SO20	24	330	1000
SO28	24	330	1000
PLCC20	16	330	1000
PLCC28	24	330	500
PLCC44	24	330	500
PLCC52	32	330	500
PLCC68	44	330	250

* Tape and reel dimensions as specified in "EIA 481-A" and "IEC 286-3" standard specification.

DRY PACKING FOR SMD PACKAGES

It is well known that the main difference between Through Hole Technology (THT) and Surface Mount Technology (SMT) is the different way of soldering the devices onto the printed board.

In THT, the package body is exposed to relatively low temperatures (<150°C), as the lead extremities only are dipped in the soldering alloy. On the contrary in SMT, the package body is kept at a very high temperature (>200°C), with any industrial soldering method (wave, IR, vapour phase).

Furthermore molding compounds, used for integrated circuit encapsulation, are somewhat hygroscopic and absorb moisture from the ambient. During rapid heating in solder reflow process, this absorbed moisture can vaporize, generating pressure at leadframe pad/silicon to plastic interfaces in the package, with a risk of package cracking and potential degradation of device reliability.

Moisture sensitive Surface Mount Devices (SO, PLCC, PQFP...) are dry packed, to protect them from moisture absorption during shipment / storage and then to reduce these failure risks. IPC-SM-786 guideline is followed.

DRY PACKING

1 - Materials

- a) Moisture Barrier: Watervaporproof Bag as per MIL-B-81705C, Type I with WVTR 0.02 gm/100 sq.inches/24 hours, maximum.
- b) Non-dusting bagged Desiccant as per MIL-D-3464E, Type II.
- c) Humidity Indicator Card as per MIL-I-8835A with method II of MIL-P-116.

2 - Procedure

Dried SMD parts in tubes, trays or tape are first put into a dampproof bag, with desiccant (as silica gel) and a humidity indicator card.

The bag is then vacuum sealed and a moisture sensitive warning label is stuck on. After, the bag is put into the packing box.

3 - Storage conditions

Parts with Dry Pack are recommended to be stored in Dry Box.

When Dry Box is not available the following conditions are considered as case examples:

- a) Temperature : 5 - 30°C.
R.H. : 60% max.
 - b) Temperature : 30-40°C.
R.H. : 90% max.
- In the case (a), the integrity of the bag and desiccant is estimated good for 2 years max. from the bag seal date; in the worst case (b), the expiration time is 12 months max.

4 - Handling after Dry Pack breaking

After Dry Pack breaking, proceed as follows:

- a) if Moisture Indicator Card shows R.H. >20% or Desiccant colour has turned pink, the parts have expired. Rebake as stated here below.
- b) if the parts have not expired, store them in air conditioning ambient (20-30°C < 60%R.H.) and put into reflow soldering bath within 48 hours. Exceeding 48 hours, the parts shall be rebaked as stated here below.
- c) if it is necessary a longer storage time after Dry Pack breaking, store the parts indefinitely in Dry Box (<20% R.H.) or repack immediately with desiccant.

DRY PACKING FOR SMD PACKAGES (continued)

5 - Recommended baking conditions

- a) 125°C. for 24 hours to be used only once and ONLY if the devices are transferred from the shipping tubes/tape-and-reel to a high temperature plastic/metal tube or tray.
- b) 40°C. for 192 hours in a <5% R.H. ambient may be performed with the devices remaining in the original shipping containers.

After baking, repack parts in a dampproof bag with desiccant and humidity indicator card, as stated above. Now the parts are ready to be mounted on a board.



DESICCANT INCLUDED

SEAL DATE:

CAUTION!!!

THIS BAG CONTAINS MOISTURE SENSITIVE DEVICES
DO NOT OPEN EXCEPT UNDER CONTROLLED CONDITIONS

EXPIRATION DATE: SEAL DATE PLUS TWELVE MONTHS

- 1 THIS BAG MAY BE STORED UNOPENED FOR UP TO TWELVE MONTHS AT -40°C. AND 90% HUMIDITY
- 2 THE CONTENTS OF THIS BAG MAY BE STORED INDEFINITELY AT <20% HUMIDITY
- 3 IF UPON OPENING, THE MOISTURE INDICATOR CARD SHOWS HUMIDITY ABOVE 20%, CONTENTS HAVE EXPIRED
- 4 IF CONTENTS ARE EXPIRED, THEY MAY STILL BE USED WITH THE ADDITION OF

A BAKE OF 192 HOURS AT 40°C. < 5% HUMIDITY, OR A BAKE OF 24 HOURS AT 125°C

CAUTION THE PACKING MATERIALS WILL MELT AT 125°C. METAL TUBES OR SHEETS MUST BE USED AT HIGH TEMPERATURE

- 5 THE CONTENTS OF THIS BAG MUST BE MOUNTED ON A BOARD WITHIN 48 HOURS OF OPENING THIS BAG

Section 4.0

HANDLING AND MOUNTING OF POWER PACKAGES

HANDLING AND MOUNTING ICs IN PLASTIC POWER PACKAGES

by R. Tiziani and L. Capra

Integrated circuits mounted in plastic power packages can be damaged, or reliability compromised, by inappropriate handling and mounting techniques. Avoiding these problems is simple if you follow the suggestions in this section.

Advances in power package design have made it possible to replace metal packages with more economical plastic packages in many high power applications. Most of SGS-THOMSON Microelectronics power integrated circuits, for example, are mounted in some innovative packages, like MULTIWATT, FLEXIWATT and CLIPWATT, developed originally for high power audio amplifiers. Though the intrinsic reliability of these packages is now excellent, the use of inappropriate techniques or unsuitable tools during mechanical handling can affect the long term reliability of the device, or even damage it. With a few simple precautions, careful designers and production engineers can eliminate these risks, saving both time and money.

BENDING AND CUTTING LEADS

The first danger area is bending and cutting the leads. In these processes it is important to avoid strai-

ning the package and particularly the area where the leads enter the encapsulating resin. If the package/lead interface is strained the resistance to humidity and thermal stress are compromised, affecting reliability.

There are five basic rules to bear in mind :

- Clamp the leads firmly between the package and the bend/cut point (figure 1).
- Bend the leads at least 3mm from the package (figure 2a).
- Never bend the leads more than 90° and never bend more than once (figure 2b).
- Never bend the leads laterally (figure 2c).
- Make sure that the bending/cutting tool does not damage the leads.

Figure 1 : Clamp the Leads between the Package and Bend/cut Point.

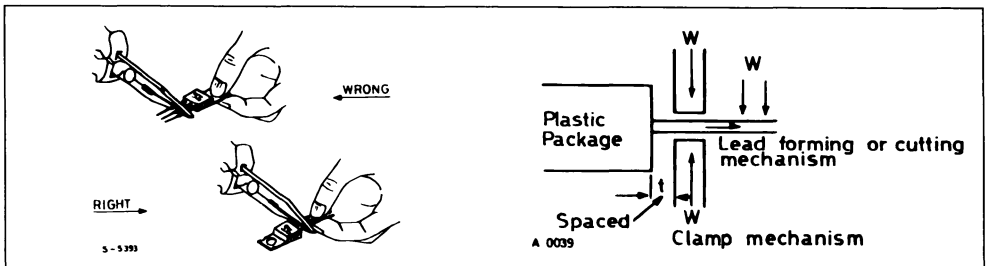
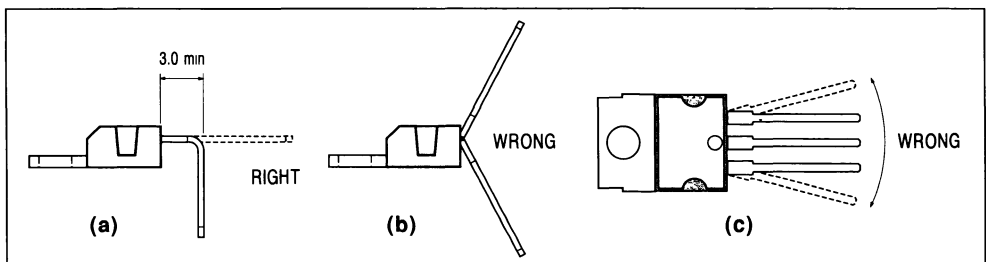


Figure 2 : Bend the Leads at Least 3mm, never Bend Leads more than 90° and never Splay the Leads Out.



APPLICATION NOTE

INSERTION

When mounting the IC on a printed circuit board the golden rule is, again, to avoid stress. In particular :

- Adhere to the specified pin spacing of the device ; don't try to bend the leads to fit non-standard hole spacing.
- Leave a suitable space between the IC and the board. If necessary use a spacer.
- Take care to avoid straining the device after soldering. If a heatsink is used and it is mounted on the PC board it should be attached to the IC before soldering.

SOLDERING

The greater danger during soldering is overheating. If an IC is exposed to high temperature for an excessive period it may be damaged or reliability reduced.

Recommended soldering conditions are 260°C for ten seconds or 350°C for three seconds. Figure 3 shows the excess junction temperature of a PENTAWATT package for both methods.

It is also important to use suitable fluxes for the soldering baths to avoid deterioration of the leads or package resin. Residual flux between the leads or in contact with the resin must be removed to guarantee long term reliability. The solvent used to remove excess flux should be chosen with care. In particular, trichloroethylene ($\text{CHCl}_2 : \text{CCl}_2$) - base solvents should be avoided because the residue could corrode the encapsulant resin.

HEATSINK MOUNTING

To exploit the full capability of a power device a suitable heatsink must be used. The most important

Figure 3a: The Excess Junction Temperature of a PENTAWATT Package in the suggested Soldering Conditions. (350°C for three seconds)

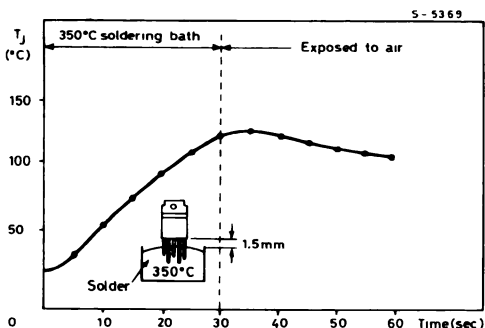
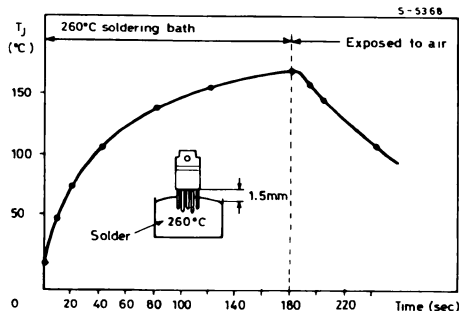


Figure3b: The Junction Temperature of a PENTA-WATT package in the suggested Soldering Conditions. (260°C for ten seconds)

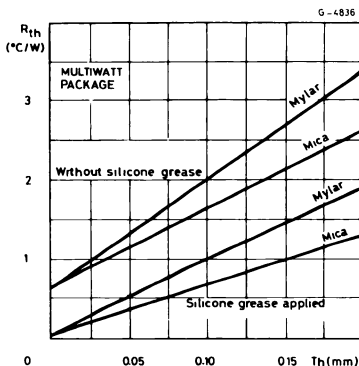


aspect from the point of view of reliability is that the heatsink is dimensioned to keep the junction temperature as low as possible. From a mechanical point of view, however, the heatsink must be designed so that it does not damage the IC. Care should also be taken in attaching the IC to the heatsink.

The contact thermal resistance between the device and the heatsink can be improved by adding a thin layer of silicon grease with sufficient fluidity to ensure uniform distribution. Figure 4 shows how the thermal resistance of a MULTI-WATT package is improved by silicone grease.

An excessively thick layer or an excessively viscous silicon grease may have the opposite effect and could cause deformation of the tab.

Figure 4 : The Thermal Resistance of a MULTI-WATT package is improved by Silicon grease. Here the contact thermal resistance is plotted against insulation layer thickness.



SGS-THOMSON plastic power packages - MULTI-WATT, HEPTAWATT, PENTAWATT and TO220 - are attached to the heatsink with a single screw, FLEXIWATT is attached with two screws. A spring clip may also be used as shown in figure 5b. The screw should be properly tightened to ensure that the package makes good contact with the heatsink. It should not be too tight or the tab may be deformed, breaking the die or separating the resin from the tab or in the case of FLEXIWATT packages an high tightening torque may cause cracks in the molded case.

The appropriate tightening torque can be found by plotting thermal resistance against torque as shown in table 1.

Suggested maximum torques for 3MA screws are 8Kg/cm for TO220, PENTAWATT, HEPTAWATT, MULTIWATT and FLEXIWATT packages. Particularly for FLEXIWATT package, clipping system is strongly recommended. If different screws, or spring clips, are used, the force exerted by the tab must be equivalent to the force produced with these recommended torques.

Even if the screw is not overtightened the tab can be deformed, with disastrous results. If the surface of the heatsink is not sufficiently flat. The planarity of the contact surface between device and heatsink must be better than 50µm for TO220, PENTAWATT, HEPTAWATT, MULTIWATT and FLEXI-

Table 1 : Table resistance junction to heatsink depends on Tightening Torque in MULTI-WATT package

Torque	R _{th} (j-heatsink) with grease	R _{th} (j-heatsink) without grease
Kg/cm	°C/W	°C/W
3	1.0	1.7
4	0.94	1.63
5	0.89	1.59
7	0.84	1.55
10	0.83	1.52
12	0.82	1.51
15	0.82	1.51

Test device: P638 (160 x 160 sq. mils)
R_{th} (j-c) = 0.6°C/W

WATT packages.

Similar problems may arise if the screwhead is too narrow compared to the hole in the heatsink (figure 6).

The solution here is to use a washer to distribute the pressure over a wider area. An alternative is to use screws of the type shown in figure 7 which have a wide flat head. When self-tapping screws are used it is also important to provide an outlet for the material deformed as the thread is formed. Poor contact and broken die will result if this is not done. Another possible hazard arises when the hole in the heatsink

Figure 5a: MULTIWATT, HEPTAWATT, PENTAWATT, TO220 and FLEXIWATT packages are attached to the heatsink with one or two screws.

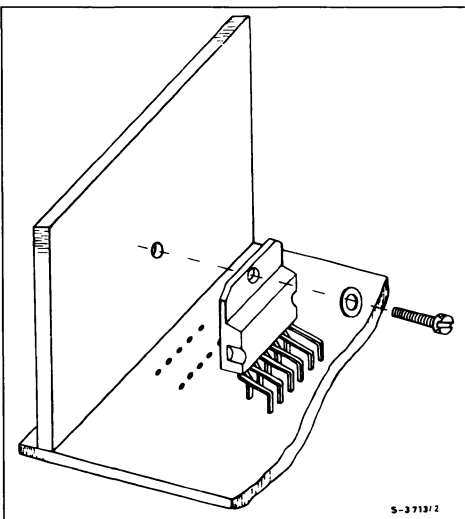
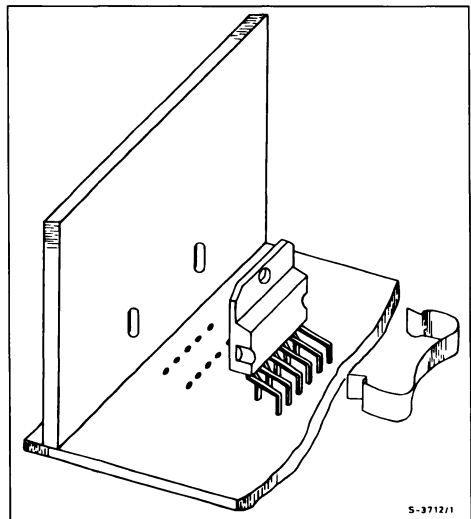


Figure 5b: MULTIWATT, HEPTAWATT, PENTAWATT, TO220 and FLEXIWATT packages are attached to the heatsink with a spring clip.

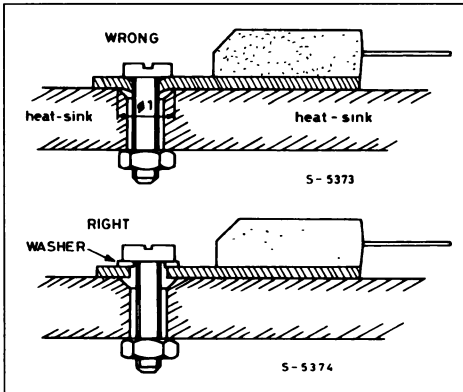


APPLICATION NOTE

is formed with a punch: a circular depression may be formed around the hole, leading to deformation of the tab. This may be cured by using a washer or by modifying the punch.

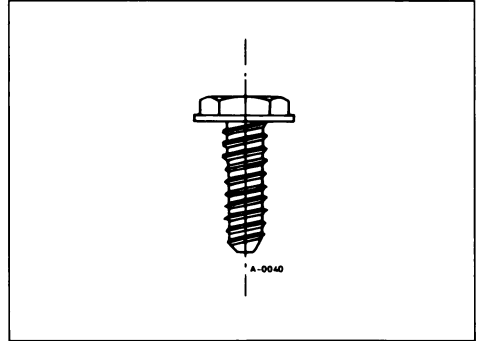
Serious reliability problems can be encountered if the heatsink and printed circuit board are not rigidly connected. Either the heatsink must be rigidly attached to the printed circuit board or both must be se-

Figure 6 : The Heatsink Tab may be deformed if a Washer or a Wide-headed Screw is not used.



curly attached to the chassis. If this is not done the stresses and strains induced by vibration will be applied to the device and in particular to the lead/resin interface. This problem is more likely to arise when large boards and large heatsinks are used or whenever the equipment is subjected to heavy vibrations.

Figure 7 : The recommended Screw Type Looks Like this.



Section 5.0

DEDICATED PRODUCTS INDEX

DEDICATED PRODUCT INDEX

Devices	Description	Package
EF7333	Cept PCM Trunk Controller	CERDIP28
EF7910	V.21/V.23 FSK Modem	CERDIP28/DIP28
EF9345/EF9367	Semi-Graphic Display Processors (GDP)	DIP40
EF73321	PCM Line Transceiver	CERDIP16/DIP16
EFG7189	DTMF Generator for Binary Coded Hexadec.Data	DIP14
EFG71891	DTMF Generator for Binary Coded Hexadec.Data	Minidip
ESM1600B/2B	Quad Comparator Interface Circuit	DIP14/SO16
ETC5040/A	PCM Monolithic Filter	CERDIP16
ETC5040FN/AFN	PCM Receive/Transmit Filter	PLCC20
ETC5040X/AX	Ext. Temp. Range PCM Monolithic Filter	CERDIP16
ETC5054/ETC5057	Serial Interface Codec/Filter	CERDIP16/DIP16
ETC5054FN/ETC5057FN	Serial Interface Codec/Filter	PLCC20
ETC5054X/ETC5057X	Ext. Temp. Range, Serial Interf. Codec/Filter	CERDIP16
ETC5056	Parallel Data Interface Codec/filter	CERDIP20
ETC5064/ETC5067	Serial Inter. Codec/Filter with RX PW Amp.	CERDIP20/DIP20
ETC50S64/ETC50S67	Serial Interf. Codec/Filter + RX PW Amp.	CERDIP20/DIP20
ETC5064FN/ETC5067FN	Ser.Interf. Codec/Filter + RX PW Amp.	PLCC20
IMSA113	Programmable Delay Line-9 Bits Data	PLCC44
IMSG171	6-Bit CLUT Vga Compatible	DIP28
IMSG176/L	6-Bit CLUT Vga Compatible	DIP28/PLCC44
IMSG177	Low Power CLUT	DIP28
L149	4A Linear Driver	Pentawatt
L165	3A Power Operational Amplifier	Pentawatt
L200	Adjustable Voltage And Current Regulator	Pentawatt
L272D	Dual Power Operational Amplifier	SO16
L272	Dual Power Operational Amplifier	POWERDIP (8+8)
L272M	Dual Power Operational Amplifier	Minidip
L290	Tachometer Converter	Dip16
L291	5 Bit D/A Converter And Position Amplifier	Dip16
L292	Switch-Mode Driver For Dc Motors	Multiwatt11
L293B	Push-Pull Four Channel Driver	Dip16
L293C	Push-Pull Four Channel/Dual H-Bridge Driver	DIP20
L293D	Push-Pull Four Channel Driver + Diodes	POWERDIP (12+2+2)
L293E	Push-Pull Four Channel Driver	POWERDIP (16+2+2)
L294	Switch-Mode Solenoid Driven	Multiwatt11
L295	Dual Switch Mode Solenoid Driver	Multiwatt15
L296/P	High Current Switching Regulator	Multiwatt15
L297/A	Stepper Motor Controller	DIP20

DEDICATED PRODUCTS INDEX

Devices	Description	Package
L298N	Dual Full Bridge Driver	Multiwatt15
L387A	5V-0.4A Very Low Drop Regulator	Pentawatt
L482	Hall-Effect Pickup Ignition Controller	DIP16/SO16
L484	Magnetic Pickup Ignition Controller	DIP16/SO16
L497	Hall Effect Pickup Ignition Controller	DIP16/SO16
L530	Electronic Ignition Interface	DIP16/SO16
L584	Multifunction Injection Interface	POWERDIP (12+2+2)
L585	Car Alternator Regulator	DIP16/SO16
L601/2/3/4	Darlington Arrays	DIP18
L702B	2A Quad Darlington Switch	POWERDIP (8+8)
L702N	2A Quad Darlington Switch	Multiwatt11
L2720	1A Low Drop Dual Power Op.Amp.	POWERDIP (8+8)
L2722	1A Low Drop Dual Power Op.Amp.	Minidip
L2724	1A Low Drop Dual Power Op. Amp.	SIP9
L2726	1A Low Drop Dual Power Op. Amp.	SO20 (12+4+4)
L2750	Dual Low Drop High-Power Amplifier	Multiwatt11
L3000/10	Subscriber Line Interface Circuit Kit	Flexiwatt15/DIP28
L3000/30	Subscriber Line Interface Circuit Kit	Flexiwatt15/DIP28/PLCC44
L3000/90	Subscriber Line Interface Circuit Kit	Flexiwatt15/DIP28
L3000/91	Subscriber Line Interface Circuit Kit	Flexiwatt15/DIP28/PLCC28
L3092	SLIC for PABX	DIP28
L3240/D	Electronic Two-Tone Ringer	Minidip/SO8
L3280	Low Voltage Telephone Speech Circuit	DIP14
L3281A	Low Voltage Speech Circuit	DIP14/SO14
L3845	Trunk Interface	Minidip
L4620	Liquid Level Alarm	Minidip
L4805/10/12	0.4A Very Low Drop Voltage Regulator	TO220/SOT82
L4885	0.4A Very Low Drop Voltage Regulator	TO220/SOT82
L4892	0.4A Very Low Drop Voltage Regulator	TO220/SOT82
L4901A	Dual 5V Regulator with Reset	Heptawatt
L4902A	Dual 5V Regulator with Reset and Disable	Heptawatt
L4903	Dual 5V Regulator with Reset and Disable	Minidip
L4904A	Dual 5V Regulator with Reset	Minidip
L4905	Dual 5V Regulator with Reset and Disable	Heptawatt
L4915	Adjustable Voltage Regulator Plus Filter	Minidip(4+4)
L4916	Voltage Regulator Plus Filter	Minidip(4+4)
L4918	Voltage Regulator Plus Filter	Pentawatt
L4920	Very Low Drop Adjustable Regulator	Pentawatt
L4921	Very Low drop Adjustable Regulator	Minidip
L4922	5V-1A Very Low Drop Regulator with Reset	Heptawatt
L4923	5V-1A Very Low Drop Reg.+ Reset and Inhibit	Heptawatt
L4925	5V Very Low Drop Regulator with Reset	Pentawatt
L4930	Dual Very Low Drop Voltage Regulator	Heptawatt

DEDICATED PRODUCTS INDEX

Devices	Description	Package
L4934	Dual 5V Regulator with Reset and Aux. Function	Minidip
L4935	Dual 5V Regulator with Reset and Aux. Function	POWERDIP (12+2+2)
L4936	Dual Multifunction Voltage Regulator	Multiwatt11
L4937	Dual Multifunction Voltage Regulator	Heptawatt
L4938	Dual Multifunction Voltage Regulator	POWERDIP (12+2+2)
L4945	5V-0.5A Very Low Drop Regulator	TO220
L4947	5V-0.5A Very Low Drop Regulator with Reset	Pentawatt
L4949	100mA Very Low Drop Regulator	Minidip
L4960	2.5A Power Switching Regulator	Heptawatt
L4962	1.5A Power Switching Regulator	POWERDIP(12+2+2)
L4962E	1.5A Power Switching Regulator	Heptawatt
L4963	1.5A Power Switching Regulator	POWERDIP(12+3+3)
L4964	High Current Switching Regulator	Multiwatt15
L4968	Step-Up Converter	POWERDIP (16+2+2)
L4970A	10A Switching Regulator	Multiwatt15
L4972A/D	2A Switching Regulator	POWERDIP (16+2+2)/SO20
L4974A	3.5A Switching Regulator	POWERDIP (16+2+2)
L4975A	5A Switching Regulator	Multiwatt15
L4977A	7A Switching Regulator	Multiwatt15
L6114	Quad 100v Dmos Switch	POWERDIP (14+3+3)
L6115	Quad 100v Dmos Switch	POWERDIP (14+3+3)
L6122	100V Dmos Switch	POWERDIP (14+3+3)
L6123A	Three 100V Dmos Switch	Multiwatt15
L6201	Dmos Full Dridge Driver	SO20 (14+3+3)
L6202	Dmos Full Bridge Driver	POWERDIP (14+3+3)
L6203	Dmos Full Bridge Driver	Multiwatt11
L6204	Dmos Dual Full Bridge Driver	POWERDIP(16+2+2)
L6210	Dual Schottky Diode Bridge	POWERDIP (12+2+2)
L6213	4A Solenoid Driver+1A Smps	POWERDIP (16+2+2)
L6218	Stepper Motor Driver	POWERDIP(16+2+2)
L6218D	Stepper Motor Driver	SO20(16+2+2)
L6219	Dual Stepper Motor Driver	DIP24
L6220	Quad Darlington Switch	POWERDIP (12+2+2)
L6220N	Quad Darlington Switch	Multiwatt15
L6221A	Quad Darlington Switch	POWERDIP (12+2+2)
L6221C	60V Quad Darlington Switch	POWERDIP (12+2+2)
L6221N	Quad Darlington Switch	Multiwatt15
L6223A	High-Speed Unipolar Stepper Motor Driver	DIP20
L6232A/B	Spindle Driver	PLCC44/PLCC28
L6242	Voice Coil Driver	SO20
L6280	Multipower System	PLCC44
L6310	Battery charger	Heptawatt
L6311	Battery charger	POWERDIP (8+8)

DEDICATED PRODUCTS INDEX

Devices	Description	Package
L6504	Solenoid Controller	DIP14
L6506	Current Controller For Stepping Motors	DIP18
L6515	Dual DC Motor Positioning System	PLCC44
L6603A	Memory Card Interface	DIP28
L6604A	Memory Card Interface	PLCC28
L6720	Minitel Interface	DIP20
L9222	Quad Inverting Transistor Switch	POWERDIP (12+2+2)
L9305/C	Dual High Current Relay Driver	POWERDIP (8+8)
L9307	Dual High Current Low Side Driver	Multiwatt11
L9308	Dual Low Side Driver	Minidip
L9309	Dual High Current Low Side Driver	SIP10
L9324/5	Window Lift Controller	DIP20
L9335/6	Injector Drivers	Pentawatt
L9350	High Side Driver	Pentawatt
L9444	Alternator Regulator	TO220
L9448	Alternator Regulator	TO220
L9480VB	One Chip Car Alternator Regulator	TO220
L9610C/11C	PWM Powermos Controller	SO16/DIP16
L9686	Automotive Direction Indicator	Minidip
L9700	Hex Precision Limiter	Minidip
L9703/4	Octal Ground Contact Monitoring Circuit	DIP20/SO20
L9801A	High Side Driver	Pentawatt
L9811	DC and PWM High Side Driver	Heptawatt
L9812	1A DC and PWM High Side Driver	Heptawatt
L9821	High Side Driver	Pentawatt
L9822	Octal Serial Solenoid Driver	Multiwatt15
L9830	Monolithic Lamp Dimmer	Heptawatt
L9842	Octal Parallel Low Side Driver	DIP20/SO20
LS156	Telephone Speech Circuit with MF Tone Gen.Interface	DIP16
LS256	Telephone Speech Circuit with MF Tone Gen.Interface	DIP16
LS285	Telephone Speech Circuit	DIP14
LS356	Telephone Speech Circuit with MF Tone Gen.Interface	DIP16
LS588	Programmable Telephone Speech Circuit	DIP16
LS656	Telephone Speech Circuit with MF Tone Gen.Interface	DIP16/SO20
LS1240/A	Electronic Two-Tone Ringer	Minidip/SO8
LS1241	Electronic Two-Tone Ringer	Minidip/SO8
M044	128x128 Digital Switching Matrix	DIP28
M088	256x256 Digital Switching Matrix	DIP40
M089	2x8 Crosspoint Matrix	CERDIP16/DIP16
M093	12x8 Crosspoint Switch With Control Memory	DIP40/PLCC44
M114A/F	Digital Sound Generator	DIP48
M114S/F	Digital Sound Generator	DIP40
M116	PCM Conf. Call and Atten./Noise Suppress.Circuit	CERDIP24/DIP24

DEDICATED PRODUCTS INDEX

Devices	Description	Package
M206	TV-PLL Microcomputer Interface	DIP28
M491	Voltage Tuning System	DIP40
M494	Voltage Tuning System	DIP40
M705	15/16 Divider for TV-PLL	Minidip
M708/A	PCM Remote Control Transmitter	DIP20
M708L	PCM Remote Control Transmitter	DIP20
M709/10	PCM Remote Control Transmitter	DIP24/DIP28
M761E	Dual Tone Multifrequency Generator	DIP18
M764A	Tone Ringer	DIP16
M3004	Remote Control Transmitter	DIP20
M3005	Remote Control Transmitter	DIP20
M3006	Remote Control Transmitter	DIP20
M3444	CMOS 128x128 Digital Switching Matrix	CERDIP28
M3488	CMOS 256x256 Digital Switching Matrix	CERDIP40
M3493/4	CMOS Crosspoint With Control Memory	DIP40/PLCC44
M3540	Single Number Pulse Tone Switch. Dialer with Save	DIP20
M3541	Single Number Pulse Tone Switchable Dialer	DIP20
M5116	u-25 Law Companding Codec	CERDIP16/DIP16
M5156	A-Law Companding Codec	CERDIP16
M5450/51	LED Display Driver	DIP40
M5480	LED Display Driver	DIP28
M5481/2	LED Display Driver	DIP20
M5913	Single Chip PCM Codec and Filter	CERDIP20/DIP20
M5914	Single Chip PCM Codec and Filter	CERDIP24/DIP24
M5917	Single Chip PCM Codec and Filter	DIP16
M8716	Clock/Calendar	Minidip
M145026/7	RC Encoder	DIP16/SO16
M145028	RC Decoder	DIP16/SO16
M34930	12x8 Crosspoint	DIP40/PLCC40
MC1488	RS232C Quad Line Driver	CERDIP14/DIP14
MC1488D	RS232C Quad Line Driver	SO14
MC1489A	RS232C Quad Line Receiver	CERDIP14/DIP14
MC1489AD	RS232C Quad Line Receiver	SO14
MC3479C	Motor Driver	POWERDIP(12+2+2)
MK2180A	T1 Transceiver	DIP40/PLCC44
MK5021Q	Hi-Speed Comm. Controller	PLCC52
MK5025	CCITT X.25 Link Level Controller	CERDIP48/PLCC52
MK5027	SS7 Signalling Link Controller	CERDIP48/PLCC52
MK5029	HDLC NRM Second Control	CERDIP48/PLCC52
MK5030	StarLAN HUB Communication Circuits	CERDIP48/PLCC52
MK5032	Variable Bit-rate IEEE 802.3 Controller	CERDIP48/DIP48
MK5033	Manchester Encoder Decoder	DIP28
MK5035	StarLAN Encoder Decoder	DIP20

DEDICATED PRODUCTS INDEX

Devices	Description	Package
MK5371	Single Number Pulse Tone Switchable Dialer	DIP18
MK5375	Ten-Number Repertory Tone/Pulse Dialer	DIP18
MK50351	Manchester/StarLAN Encoder Decoder	DIP20
MK53721	Tone/Pulse World Dialer with LNR	DIP20
MK53731	Single Number Pulse Tone Switch.Dialer	DIP18
MK53761	Repertory Dialer	DIP18
MK53762	Repertory Dialer	DIP20
MK68564	Serial Input Output	CERDIP48/DIP48
MK68592	Serial Interface Adapter (Ethernet)	CERDIP24
MK68901	Multi Function Peripheral	CERDIP48/DIP48/PLCC52
ML8204/5	Tone Ringer	Minidip
PBL3717A	Stepper Motor Driver	POWERDIP(12+2+2)
PBL3726-6	Mask-Programmable Speech Circuit	DIP18
PBL3726-11	Mask-Programmable Speech Circuit	DIP18
SAA5231	Data Slicer for Teletext Processor	DIP28
SDA5243	Computer-Controlled Teletext Decoder	DIP40
SDA5343	Computer-Controlled Teletext Decoder	DIP40
SG2524	Regulating PWM	DIP16/SO16
SG2525A/7A	Regulating PWM	DIP16/SO16
SG3524	Regulating PWM	DIP16/SO16
SG3525A/7A	Regulating PWM	DIP16/SO16
ST5075/76	Progr.Codec/Filter For ISDN / Digital Phone	DIP20/PLCC28
ST5080	ISDN-Progr.Audio Front-End	DIP24
ST5410	ISDN-U Interface 2B1Q	CERDIP28
ST5421	ISDN-S Interface 4B3T	CERDIP20
ST5430	ISDN-Power Supply Controller	DIP20
ST7543	Universal Modem Analog Front-End	PLCC44
ST5451	ISDN-HDLC Controller	DIP28
ST54221	H221 Video Framer	CERDIP40
ST18930/31	Digital Signal Processor	DIP48/PLCC52
STU2071	ISDN-U Interface 4B3T	CERDIP28
STU5343	Microcomp.-Controlled Teletext Decoder	DIP40/SDIP42
STV1389A	Cable Driver for Digital Transfer	QFP32
STV2100	PAL Luma-Chroma & Deflection Processor	SDIP30
STV3200	15 MHz DCT Processor	DIP40/PLCC44
STV3208	20 MHz DCT Processor	DIP40
STV3300	Y.U.V to R.G.B Converter	PLCC52
STV8438	Triple 8-Bit D/A Converter	SDIP42
TBA810P	7W Audio Amplifier	Findip
TBA810S	7W Audio Amplifier	Findip
TBA820M	1.2W Audio Amplifier	Minidip
TCA3189	FM IF High Quality Radio System	DIP16
TDA0161	Proximity Detector	Minidip/SO8

DEDICATED PRODUCTS INDEX

Devices	Description	Package
TDA1151	Motor Speed Regulator	SOT32
TDA1154	Motor Speed Regulator	Minidip
TDA1170D	Vertical Deflection System	POWERDIP(12+2+2)
TDA1170N	Vertical Deflection System	Findip
TDA1170S	Vertical Deflection System	Findip
TDA1175A	Low-noise Vertical Deflection System	Findip
TDA1180A	Horizontal Deflection Processor	DIP16
TDA1190Z	TV Sound IF	Findip
TDA1220B	AM-FM Quality Radio	DIP16
TDA1670A	Vertical Deflection System	Multiwatt15
TDA1675A	Vertical Deflection System	Multiwatt15
TDA1770A	Vertical Deflection System	DIP20
TDA1771	Ramp Generator & Vertical Output	SIP10
TDA1872A	Vertical Deflection System	Multiwatt15
TDA1904	4W Audio Amplifier	POWERDIP(8+8)
TDA1905	5W Audio Amplifier + Mute	POWERDIP(8+8)
TDA1908	8W Audio Amplifier	Findip
TDA1910	10W Audio Amplifier + Mute	Multiwatt11
TDA2003	10W Car-Radio Amplifier	Pentawatt
TDA2004A	10+10W Stereo Amplifier for Car-Radio	Multiwatt11
TDA2005	20W Bridge Amplifier for Car-Radio	Multiwatt11
TDA2006	12W Audio Amplifier	Pentawatt
TDA2007	6+6W Stereo Amplifier	SIP9
TDA2007A	6+6W Stereo Amplifier	SIP9
TDA2008	12W Audio Amplifier	Pentawatt
TDA2009	10+10W Quality Stereo Amplifier	Multiwatt11
TDA2009A	10+10W Quality Stereo Amplifier	Multiwatt11
TDA2030	14W Hi-Fi Audio Amplifier	Pentawatt
TDA2030A	18W Hi-Fi Audio Amplifier	Pentawatt
TDA2040	20W Hi-Fi Audio Amplifier	Pentawatt
TDA2050	28W Hi-Fi Audio Amplifier	Pentawatt
TDA2051	40W Hi-Fi Audio Amplifier	Pentawatt
TDA2052	65W Hi-Fi Audio Amplif.+ Mute/Std-by	Heptawatt
TDA2170	Vertical Deflection Output Stage	Multiwatt11
TDA2270	Vertical Deflection Output Stage	POWERDIP(12+2+2)
TDA2320	Remote Control Receiver	Minidip
TDA2320A	Stereo Preamplifier	Minidip
TDA2540	Video IF+AGC for NPN Tuner	DIP16
TDA2541	Video IF+AGC for PNP Tuner	DIP16
TDA2593	Horizontal Processor for Color TV	DIP16
TDA2822	Dual 1.7 W Amplifier	POWERDIP(12+2+2)
TDA2822D	Dual 1W Amplifier	SO8
TDA2822M	Dual 1W Amplifier	Minidip

DEDICATED PRODUCTS INDEX

Devices	Description	Package
TDA2824	Dual 1.7 W Amplifier	POWERDIP(12+2+2)
TDA2824S	Dual 1.7 W Amplifier	SIP9
TDA3190	Complete TV Sound Channel	POWERDIP(12+2+2)
TDA3420	Dual Very Low-Noise Preamplifier	DIP16/SO16
TDA3562A	Complete PAL+NTSC Decoder	DIP28
TDA4190	TV Sound Channel with DC Controls	POWERDIP(12+2+2)
TDA4433	Signal Identification and AFC Interface	DIP14
TDA4443	Multistandard Video IF	DIP16
TDA4445A/B	Multistandard Sound IF	DIP16
TDA4601	Switch Mode Power Supply	SIP9/POWERDIP(8+8)
TDA4950	E/W Correction Circuit	Minidip
TDA7211A	Low Voltage FM Front-End	Minidip
TDA7220	Very Low Voltage AM/FM Radio	DIP16
TDA7222	3V AM/FM Single-Chip Radio	DIP16
TDA7227	Single-Chip AM/FM Radio with Front-End	DIP20
TDA7231A	1.6W Audio Amplifier	Minidip
TDA7233/D	1W Audio Amplifier + Mute	Minidip/SO8
TDA7233S	1W Audio Amplifier + Mute	SIP9
TDA7236/D	Very Low-Voltage Audio Bridge	Minidip
TDA7240A	20W Amplifier for Car-Radio	Heptawatt
TDA7241	20W Bridge Amplifier for Car-Radio	Heptawatt
TDA7241B	20W Bridge Amplifier for Car-Radio	Heptawatt
TDA7245	5W Audio Amplifier	POWERDIP(9+9)
TDA7246	10W Audio Amp. + Mute and Stand-by	Heptawatt
TDA7250	Hi-Fi Dual Driver	DIP20
TDA7256	22W Bridge Amplifier	Multiwatt11
TDA7262	20+20W High-Quality TV Amplifier	Multiwatt11
TDA7271	High-Class Motor Speed Regulator	SO20(16+2+2)
TDA7272	High-Class Motor Speed Regulator	POWERDIP(16+2+2)
TDA7273/D	Stereo Cassette Playback System	DIP16/SO16
TDA7274	Low-Voltage Motor Speed Regulator	Minidip
TDA7275A	Motor Speed Regulator	Minidip
TDA7282/D	Stereo Low-Voltage Cassette Preamp.	Minidip/SO8
TDA7284/D	Record/Playback Circuit With ALC	DIP14
TDA7285	Complete Stereo Cassette Player	DIP20/SO20
TDA7300	Digital Control Stereo Audio Processor	DIP28/SO28
TDA7302	Digital Control Stereo Audio Processor	DIP28
TDA7306	Digital Control Stereo Audio Processor	DIP28
TDA7318	Digital Control Stereo Audio Processor	DIP28/SO28
TDA7326	AM/FM Radio Frequency Synthesizer	DIP16/SO16
TDA7330	RDS Demodulator + Filter	DIP20/SO20
TDA7332	RDS Filter	DIP14/SO14
TDA7350	Bridge/Stereo Amplifier for Car-Radio	Multiwatt11

Devices	Description	Package
TDA7350A	Bridge/Stereo Amplifier for Car-Radio	Multiwatt11
TDA7353	24W Bridge/Stereo Amplifier for Car-Radio	Multiwatt11
TDA7360	Bridge/Stereo Amplifier + Clipping Detector	Multiwatt11
TDA7361	Low Voltage NBFM IF System	DIP16/SO16
TDA7362	Stereo Amplifier + Clipping Detector	Multiwatt11
TDA7363	24W Bridge/Stereo + Clipping Detector	Multiwatt11
TDA7370	Quad Power Amplifier for Car-Radio	Multiwatt15
TDA7374	Dual Bridge Amplifier for Car-Radio	Multiwatt15
TDA8102A	H/V Processor for TTL V.D.U.	DIP20
TDA8102B	H/V Processor for TTL V.D.U.	DIP20
TDA8118D	VCR Amplifier & Signal Interface	SO20
TDA8120	Multistandard Video IF	DIP24
TDA8123A	Video & Sound IF System	DIP20
TDA8124	Multistandard Video IF Interface	DIP20
TDA8128	Synch.Separator and Video Signal Identif.	Minidip
TDA8134	Dual Voltage Reg. + Disable (+5.1V +12V)	Heptawatt
TDA8135	Dual Voltage Reg. + Disable (+5V adjustable)	Heptawatt
TDA8136	Dual Voltage Reg. + Disable & Reset (+12V)	Heptawatt
TDA8137	Dual Voltage Reg. + Disable & Reset (+5.1V)	Heptawatt
TDA8138	Dual Voltage Reg. + Disable & Reset (+5.1V)	Heptawatt
TDA8139	Dual Voltage Reg. + Disable & Reset (+5.1V)	SIP9
TDA8140A	Horizontal Deflection Power Driver	POWERDIP(8+8)
TDA8143A	Horizontal Deflection Power Driver	SIP9
TDA8145	E/W Correction Circuit (square tube)	DIP8
TDA8146	E/W Correction Circuit (Universal)	DIP14
TDA8153	RGB Video Output Amplifier	Multiwatt15
TDA8160	Remote Control Receiver	Minidip
TDA8170	Vertical Deflection Output Circuit	Heptawatt
TDA8170A	Vertical Deflection Output Circuit	Heptawatt
TDA8172	Vertical Deflection Output Circuit	Heptawatt
TDA8172A	Vertical Deflection Output Circuit	Heptawatt
TDA8173	Vertical Deflection Output Circuit	DIP16
TDA8174	Ramp Generator & Vertical Output	Multiwatt11
TDA8175	Vertical Deflection Output Circuit	Heptawatt
TDA8176	Vertical Deflection System	Multiwatt15
TDA8178FS	Vertical Deflection Output Circuit	Heptawatt
TDA8178S	Vertical Deflection Output Circuit	Heptawatt
TDA8179FS	Vertical Deflection Output Circuit	Heptawatt
TDA8179S	Vertical Deflection Output Circuit	Heptawatt
TDA8185	H/V Processor for Color TV	DIP24
TDA8190	TV Sound Channel with DC Controls	POWERDIP(16+2+2)
TDA8191	TV Sound Channel	POWERDIP(16+2+2)
TDA8192	Multistandard AM/FM Sound IF for TV	DIP20

DEDICATED PRODUCTS INDEX

Devices	Description	Package
TDA8196	Audio Switch & DC Volume Control	DIP8
TDA8199	Stereo Amplifier & DC Volume Control for TV	DIP8
TDA8213	Video&Sound IF System	DIP20
TDA8214A	H/V Deflection Circuit	POWERDIP(16+2+2)
TDA8215A	H/V Deflection Circuit	POWERDIP(16+2+2)
TDA8218	H/V Deflection Circuit	POWERDIP(16+2+2)
TDA9302	TV Vertical Deflection Output Circuit	Clipwatt8
TDB7711	SLIC Control Unit-Serial Interface	DIP28/PLCC28
TDB7722	SLIC High Voltage Circuit	Multiwatt15
TDE0160	Proximity Detector	DIP14/SO14
TDE1737	Intelligent Power Switch	Minidip/SO14
TDE1747	Intelligent Power Switch	SO14
TDE1767	Intelligent Power Switch	Minidip
TDE1767A	Intelligent Power Switch	Minidip
TDE1787	Intelligent Power Switch	Minidip
TDE1787A	Intelligent Power Switch	Minidip
TDE1798	Intelligent Power Switch	Minidip
TDE1890	2A BCD-IPS	Clipwatt11
TDE1891	2A BCD-IPS	Clipwatt11
TDE1897A	0.5A BCD-IPS	Minidip
TDE1898	0.5A BCD-IPS	SIP9
TDE3237	Intelligent Power Switch	Minidip/SO14
TDF1737	Relay And Lamp Driver	Minidip/SO14
TDF1778	Dual 2A Source Driver	Multiwatt11
TDF1779A	Dual 2A Source Driver	Multiwatt11
TDF1783	Low Drop Triple 1.5A Sink Driver	Multiwatt15
TDF1798	Intelligent Power Switch	Minidip
TEA1330	Stereo Decoder	DIP16
TEA2014A	Video Switch	Minidip
TEA2018A	Current Mode SMPS Controller	DIP8
TEA2019	Current Mode SMPS Controller	DIP14
TEA2025B	2+2W Stereo Amplifier	POWERDIP(12+2+2)
TEA2028B	Deflection+SMPS	DIP28
TEA2029C	Deflection+SMPS	DIP28
TEA2031A	E/W Correction Circuit	Minidip
TEA2037A	H/V Deflection for B&W TV	DIP16
TEA2114	Video Switch-Two Outputs	DIP8
TEA2117	Horiz. & Vertical Deflect. for Color Monitor	Multiwatt11
TEA2130	H/V Deflection with Auto VCR Deflection	DIP20
TEA2164	Primary SMPS Controller (Slave)	DIP16
TEA2260/1	Primary SMPS Controller (Slave)	DIP16
TEA2262	Primary SMPS Controller (Slave)	DIP16
TEA3717	Stepper Motor Driver	POWERDIP(12+2+2)

DEDICATED PRODUCTS INDEX

Devices	Description	Package
TEA3718	Motor Driver	Multiwatt15/POWERDIP(12+2+2)
TEA3718S	Stepper Motor Driver	Multiwatt15/POWERDIP(12+2+2)
TEA5040	Bus-Controlled Video Processor	DIP40
TEA5101A	RGB Video Output Amplifier	Multiwatt15
TEA5114A	RGB Switch Circuit	DIP16
TEA5115	Five Channels Video Switch	DIP18
TEA5116	Five Channels Video Switch	DIP18
TEA5170	Secondary SMPS Controller (Master)	DIP8
TEA5640E	PAL/SECAM/NTSC Decoder	DIP28
TEA5640F	PAL/SECAM Decoder	DIP28
TEA5652	Wide Band Video Processor	DIP28
TEA5701	Three Channels VCR-Head Amplifier	SO20
TEA5702	Playback&Record 2-Head VCR Amplifier	SO20
TEA5703	Playback&Record 2-Head VCR Amplifier	SO20
TEA5704	Playback&Record 2-Head VCR Amplifier	SO20
TEA5712	FM Audio Play&Record Amplifier for VCR	SO16
TEA6414A	Bus-Controlled Video Matrix Switch	DIP20
TEA6415A	Bus-Controlled Video Matrix Switch	DIP20
TEA7031	Monitor Amplifier and Ringer	DIP28/SO28
TEA7037	Speech Tone	DIP28
TEA7050	Speech for High Range Telephone Set	DIP28/SO28
TEA7052	Speech Circuit with Power Management	DIP24/SO28
TEA7053	Speech Circuit	DIP20
TEA7063	Speech Circuit with Power Management	DIP20
TEA7531	Monitor Amplifier	DIP16/SO16
TEA7532	Monitor Amplifier	DIP16/SO16
TEA7540	Handsfree	DIP28
TEA7605	Low Dropout Voltage Regulator (+5V)	TO220
TEA7610	Low Dropout Voltage Regulator (+10V)	TO220
TEA7685	Low Dropout Voltage Regulator (+8.5V)	TO220
TEA7868	Line Interface	Minidip
TEA8805	1.3GHz PLL and Prescaler Circuit	DIP18/SO20
TEF3718	Stepper Motor Driver	Multiwatt15/POWERDIP(12+2+2)
TEF3718S	Stepper Motor Driver	Multiwatt15/POWERDIP(12+2+2)
TL7700A	Supply Voltage Supervisors	Minidip/SO8
TS5070	Programm. Codec/Filter Combo 2nd Gen.	CERDIP28/PLCC28
TS5071	Programm. Codec/Filter Combo 2nd Gen.	CERDIP20/DIP20
TS7513	Single Chip Asynchronous FSK Modem	DIP22
TS7514	Programmable V.23 Modem with DTMF	DIP24/PLCC28
TS7515	Single Chip DPSK and FSK Modem	DIP28
TS7538	A/S-S/A Converter	DIP28/PLCC28
TS7542	Multimode Modem Analog Front End	DIP40/PLCC44
TS9347	Single-chip semi-graphic Display Processor	DIP40/PLCC44

DEDICATED PRODUCTS INDEX

Devices	Description	Package
TS68483	Graphic & Alphanumeric Controller	PLCC68
TS68930/31	Digital Signal Processor	DIP48
TS68950/1	Modem Transmit Analog Interface	DIP24/PLCC28
TS68952	Modem Transmit/Receive Clock Generator	DIP28/PLCC28
TS75240	Digital Signal Processor	DIP48
TS75320	Digital Echo Canceller	DIP48
UAA4000	PCM Remote Control Transmitter	DIP18
UAA4713	Motion Detector Interface	DIP14/SO14
UAF1780	Dual 2A Intelligent Power Switch	DIP16/Multiwatt15
UAF1781	Dual 2A Intelligent Power Switch	Multiwatt15
UAF1782	Dual 2A Intelligent Power Switch	DIP16/Multiwatt15
UC2840	Off-Line PWM Controller	CERDIP18/DIP18
UC2842/3/4/5	Current Mode PWM Controller	Minidip/SO14
UC3840	Off-Line PWM Controller	CERDIP18/DIP18
UC3842/3/4/5	Current Mode PWM Controller	Minidip/SO14
ULN2001A/2A/3A/4A	Darlington Array	DIP16/SO16
ULN2064B/6B/8B	80V Quad Darlington Switch	POWERDIP (12+2+2)
ULN2065B/7B/9B	50V Quad Darlington Switch	POWERDIP (12+2+2)
ULN2070B/4B/6B	80V Quad Darlington Switch	POWERDIP (12+2+2)
ULN2071B/5B/7B	50V Quad Darlington Switch	POWERDIP (12+2+2)
ULN2801A/2A/3A/4A/5A	Darlington Array	DIP18

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