



Mini size of Discrete semiconductor elements



Diode Rectifier

→	Schottky SOD-723 / SOD-523 / SOD-323	-----	P1
→	TO-252 / TO263		
→	SOT-23-6 / TSSOP-8 / SOP-8		
→	mini-MELF / MELF		
→	SMA / SMB / SMC		
→	Switching SOT-523 / SOT-323 / SOT-23	-----	P2
→	Bridge (Single phase / Three phase)	-----	P3
→	RF (low capacitance) & Varactor	-----	P4



MOSFET

→	SOT-323	-----	P5
→	SOT-23		
→	TO-252 / TO-263 / TO-220 / TO-3P	-----	P6
→	TSSOP-8 / SOP-8		



Regulator

→	Switching Regulator / Charger pump	-----	P7
→	DC-DC converter / PWM IC	-----	P8
→	Step-up/down (Boost / Buck)		
→	LDO Regulator	-----	P9~
→	Ultra LDO Regulator	-----	P11



Transistor (Digital)

→	SOT-323 / SOT-363 (Dual N , Dual P , P+N)	-----	P12
→	SOT-23 / SOT-89	-----	P13
→	TO-252 / TO-263	-----	P14
→	TO-92 / TO-220 / TO-3P	-----	P15
→	Triac / SCR / RF (1GHz ~)		
→	Digital	-----	P16~
			P18



Reset IC

→	SOT-23 / SOT-23-5	-----	P19
→	SOT-89 / TO-92		

Logic IC

→	SOT-23-5 / SOT-323-5	-----	P20
→	Standard		

EEPROM IC



Protection Device

→	Sidac / Thyristor / EMI Filter	-----	P21
→	TVS / ESD Arrays / Varistor (chip)	-----	P22
→	Gastube arrester / 5~6 pin arrester	-----	P23
→	Polymer resetable fuse / Thermal switch & sensor	-----	P24

Film Capacitor

→	Class X1 / X2 Safety license (300Vac)	-----	P25
→	MPP / MPE / DMP (High current)		
→	Minibox DC film cap. / <u>X+Y</u> combint cap.	-----	P26
→	Lighting film / AC starting film cap.		



Ceramic Cap.

→	Class Y1 / Y2 Safety license	-----	P27
→	High voltage (1KV ~ 6KV)		
→	Chip Capacitors & Multilayer (MLCC)		
→	Tantalum Capacitors		



Package Outline Dimensions

----- P28 ~ P34

***Other Industrial specification (-20°C / -30°C / - 40°C ~ 85°C)**

Switching Diode (mini size SMD)

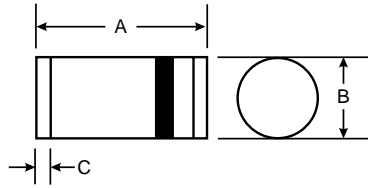
SOD-723 (2-pin , L*W*T=1.0mm*0.6mm*0.4mm) alike <u>0402 SIZE</u> (P.28)											
Package	Part Number	Peak Repetitive Reverse Voltage	Max Average Rectified Current		Max. Peak Forward Surge Current		Forward Voltage Drop		Max. Reverse Current		Circuit Figure
		V RRM	Io@T		IFSM@T		VF@IF(Max)		IR@VR		
		V	A	C	A	S	V	A	A	V	
SOD-723 (P.28)	BAS16NS	80	0.225	75	4	8.3m	1.0	0.01	0.005	75	-
SOD-523 (P.28)	BAS16US	80	0.225	75	4	8.3m	1.0	0.01	0.005	75	-
SOD-323 (P.28)	BAS16WS	75	0.225	75	4	8.3m	1.0	0.05	0.005	75	-
	1N4148WS	100	0.2	75	4	1.0m	1	0.05	2.5u	75	-
	BAV16WS	100	0.1	75	2	1.0uS	0.855	0.01	1u	75	-
	BAV19WS	120	0.1	75	2.5	1.0uS	1	0.1	0.1u	100	-
	BAV20WS	200	0.1	75	2.5	1.0uS	1	0.1	0.1u	150	-
	BAV21WS	250	0.1	75	2.5	1.0uS	1	0.1	0.1u	200	-
SOD-123 (P.28)	1N4148W	100	0.2	75	2.5	1.0m	1	0.1	0.1u	100	-
	BAV16W	100	0.1	75	2	1.0uS	0.855	0.01	1u	75	-
	BAV19W	120	0.1	75	2.5	1.0uS	1	0.1	0.1u	100	-
	BAV20W	200	0.1	75	2.5	1.0uS	1	0.1	0.1u	150	-
	BAV21W	250	0.1	75	2.5	1.0uS	1	0.1	0.1u	200	-
SOT-523 (P.28)	GS02BWU	100	0.2	75	2	1.0m	0.855	0.01	1	75	1-->3
	GS02BAWU	100	0.2	75	2	1.0m	1	0.05	2.5	75	3-->1 , 3-->2
	GS02BCWU	100	0.2	75	2	1.0m	1	0.05	2.5	75	1-->3 , 2-->3
	GS02BSWU	100	0.2	75	2	1.0m	1	0.05	2.5	75	1-->3 , 3-->2
SOT-323 (P.28)	GS02BW	100	0.2	75	2	1.0m	0.855	0.01	1	75	1-->3
	GS02BAW	100	0.2	75	2	1.0m	1	0.05	2.5	75	3-->1 , 3-->2
	GS02BCW	100	0.2	75	2	1.0m	1	0.05	2.5	75	1-->3 , 2-->3
	GS02BSW	100	0.2	75	2	1.0m	1	0.05	2.5	75	1-->3 , 3-->2
	BAS16W	100	0.1	75	2	1.0uS	0.855	0.01	1u	75	1-->3
	BAS19W	120	0.1	75	2.5	1.0uS	1	0.1	0.1u	100	1-->3
	BAS20W	200	0.1	75	2.5	1.0uS	1	0.1	0.1u	150	1-->3
	BAS21W	250	0.1	75	2.5	1.0uS	1	0.1	0.1u	200	1-->3
SOT-23 (P.28)	GS02B	100	0.35	75	2	1.0m	0.855	0.01	1	75	1-->3
	GS02BA	100	0.35	75	2	1.0m	1	0.05	2.5	75	3-->1 , 3-->2
	GS02BC	100	0.35	75	2	1.0m	1	0.05	2.5	75	1-->3 , 2-->3
	GS02BS	100	0.35	75	2	1.0m	1	0.05	2.5	75	1-->3 , 3-->2
	BAS16	100	0.1	75	2	1.0uS	0.855	0.01	1u	75	1-->3
	BAS19	120	0.1	75	2.5	1.0uS	1	0.1	0.1u	100	1-->3
	BAS20	200	0.1	75	2.5	1.0uS	1	0.1	0.1u	150	1-->3
	BAS21	250	0.1	75	2.5	1.0uS	1	0.1	0.1u	200	1-->3
mini-Melf (P.28)	LL4148	100	0.15	75	0.5	1	1	0.05	5u	100	-
	LL4448	100	0.15	25	2	1.0uS	1	0.1	5	75	-
	LL4150	50	0.15	25	4	1.0uS	1	0.2	0.1	50	-
DO-35 (P.31)	1N4148	100	0.15	25	0.5	1	1	0.01	5	75	-
	1N4448	100	0.15	25	2	1.0uS	1	0.1	5	75	-
	1N4150	50	0.15	25	4	1.0uS	1	0.2	0.1	50	-
	BAV21	250	0.1	75	2.5	1.0uS	1	0.1	0.1u	200	-



Other Package Outline Dimensions

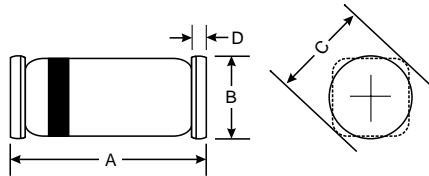
All Dimensions in mm

MiniMELF / MELF



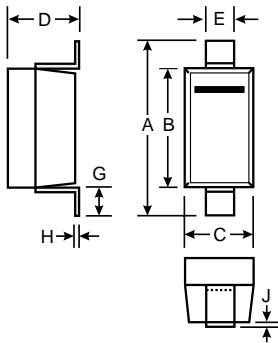
Dim	MiniMELF		MELF	
	Min	Max	Min	Max
A	3.30	3.70	4.80	5.20
B	1.30	1.60	2.40	2.60
C	0.28	0.50	0.55 Nominal	

QuadroMELF / MicroMELF



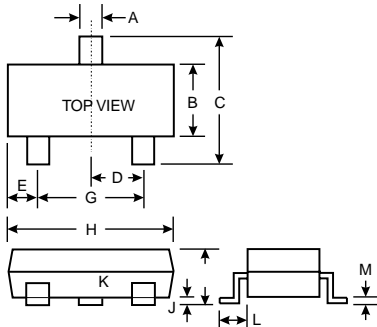
Dim	QuadroMELF		MicroMELF	
	Min	Max	Min	Max
A	3.3	3.7	1.8	2.0
B	1.4	1.6	1.20	1.25
C	1.7 \varnothing Typical		1.35 \varnothing Typical	
D	0.3 Typical		—	

SOD-123 / SOD-323 / SOD-523 / SOD-723



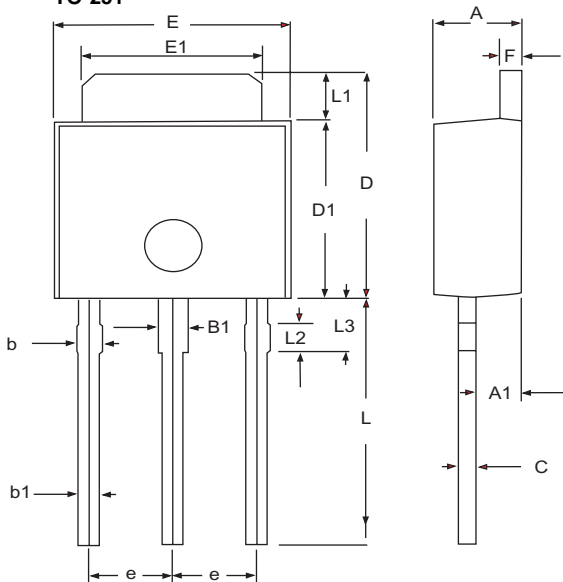
Dim	SOD-123		SOD-323		SOD-523	
	Min	Max	Min	Max	Min	Max
A	3.55	3.85	2.30	2.70	1.50	1.70
B	2.55	2.85	1.60	1.80	1.10	1.30
C	1.40	1.70	1.15	1.35	0.25	0.35
D	—	1.35	0.80	1.10	0.70	0.90
E	0.55 Typical		0.25	0.40	0.10	0.20
G	0.25	—	0.15	0.45	0.50	0.70
H	0.15 Typical		0.10	0.25	All Dimensions in mm	
J	—	0.10	—	0.10		

SOT-23 / SC-59 / SOT-323 / SOT-523

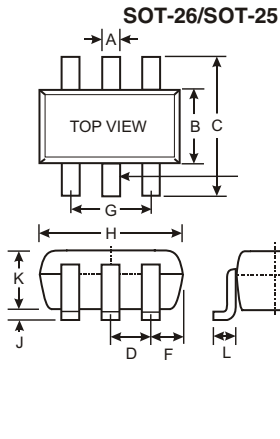


Dim	SOT-23		SC-59		SOT-323 / SOT-523	
	Min	Max	Min	Max	Min	Max
A	0.37	0.51	0.30	0.50	0.30 / 0.15	0.40 / 0.22
B	1.19	1.40	1.40	1.80	1.15 / 0.75	1.35 / 0.85
C	2.10	2.50	2.50	3.00	2.00 / 1.45	2.20 / 1.75
D	0.89	1.05	0.85	1.05	0.65 / 0.5	
E	0.45	0.61	0.30	0.70	0.30 / -	0.40 / -
G	1.78	2.05	1.70	2.10	1.20 / 0.9	1.40 / 1.1
H	2.65	3.05	2.70	3.10	1.80 / 1.5	2.20 / 1.7
J	0.013	0.15	—	0.10	-	0.10
K	0.89	1.10	1.00	1.40	0.90 / 0.6	1.00 / 0.8
L	0.45	0.61	0.55	0.70	0.25 / 0.1	0.40 / 0.3
M	0.076	0.178	0.10	0.35	0.10 / 0.1	0.25 / 0.2

TO-251



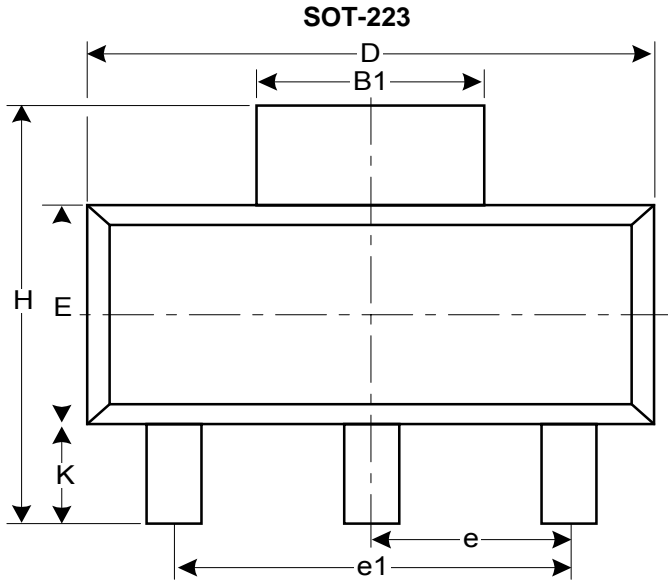
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.095
A1	1.100	1.300	0.043	0.051
B1	0.650	1.050	0.026	0.041
b	0.500	0.900	0.020	0.035
b1	0.400	0.800	0.016	0.32
C	0.400	0.600	0.016	0.024
D	6.700	7.300	0.264	0.287
D1	5.400	5.650	0.213	0.222
E	6.40	6.650	0.252	0.262
e	2.100	2.500	0.083	0.098
F	0.400	0.600	0.016	0.024
L	7.000	8.000	0.276	0.315
L1	1.300	1.700	0.051	0.067
L2	0.700	0.900	0.028	0.035
L3	1.400	1.800	0.055	0.071



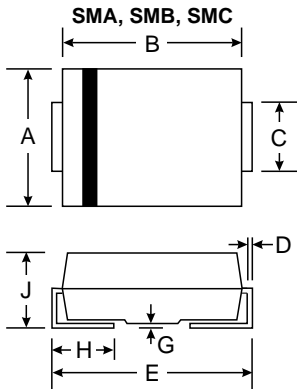
SOT-363/353		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J	—	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
α	0°	8°

SOT-26/25			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
F	—	—	0.55
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—

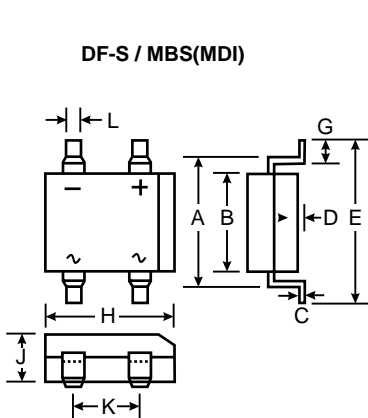
SOT-563			
Dim	Min	Max	Typ
A	0.15	0.30	0.25
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	0.50		
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.56	0.60	0.60
L	0.15	0.25	0.20
M	0.10	0.18	0.11
All Dimensions in mm			



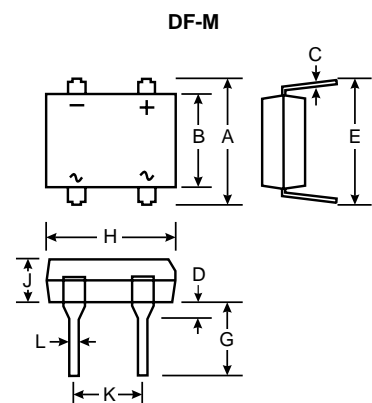
Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A(Thin)	1.50	1.65	1.80
A1	0.02	0.05	0.08
B	0.60	0.70	0.80
B1	2.90	-	3.15(Ref.)
c	0.28	0.30	0.32
D	6.30	6.50	6.70
E	3.30	3.50	3.70
e	2.3 Basic		
e1	4.6 Basic		
H	6.70	7.00	7.30
L	0.91	1.00	1.10
K	1.50	1.75	2.00
α	0°	5°	10°
β	-	13°	-

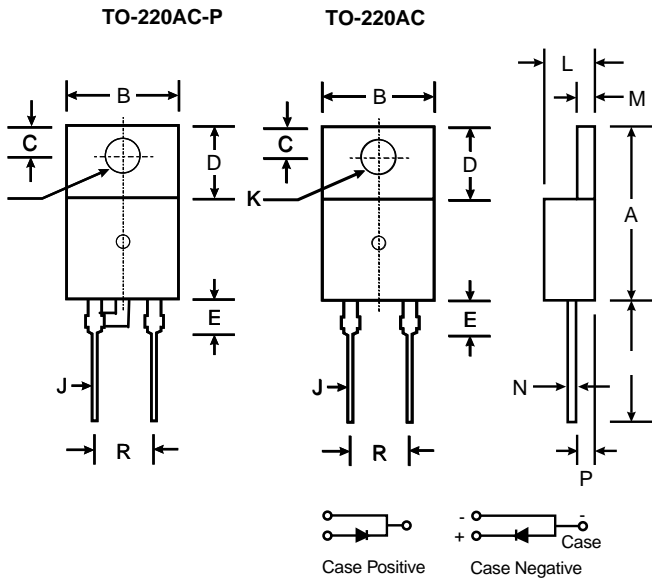


Dim	SMA		SMB		SMC	
	Min	Max	Min	Max	Min	Max
A	2.29	2.92	3.30	3.94	5.59	6.22
B	4.00	4.60	4.06	4.57	6.60	7.11
C	1.27	1.63	1.96	2.21	2.75	3.18
D	0.15	0.31	0.15	0.31	0.15	0.31
E	4.80	5.59	5.00	5.59	7.75	8.13
G	0.10	0.20	0.10	0.20	0.10	0.20
H	0.76	1.52	0.76	1.52	0.76	1.52
J	2.01	2.62	2.00	2.62	2.00	2.62

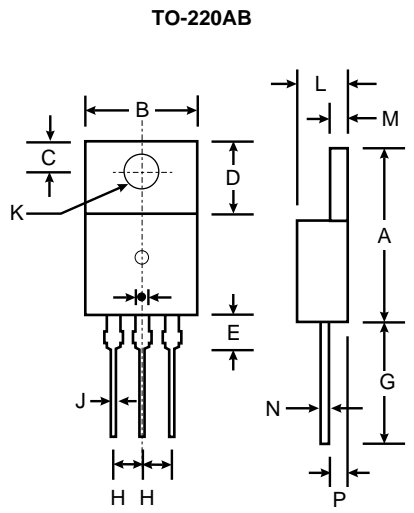


Dim	DF-S		MBS (MDI)		DF-M	
	Min	Max	Min	Max	Min	Max
A	7.40	7.90	5.43	5.75	7.40	7.90
B	6.20	6.50	3.6	4.0	6.20	6.50
C	0.22	0.30	0.15	0.35	0.22	0.30
D	0.076	0.33	0.05	0.20	1.27	2.03
E	—	10.40	—	7.0	7.60	8.90
G	1.02	1.53	0.70	1.10	3.81	4.69
H	8.13	8.51	4.5	4.9	8.13	8.51
J	2.40	3.40	2.8	2.9	2.40	3.40
K	5.00	5.20	2.5	2.7	5.00	5.20
L	1.00	1.20	0.50	0.80	0.46	0.58

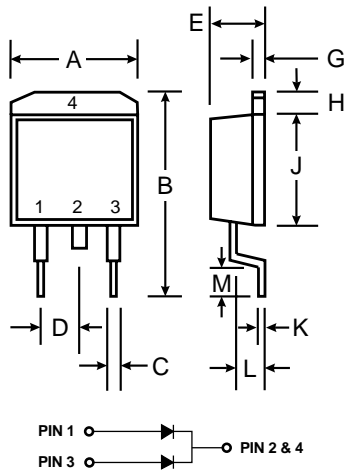




Dim	Min	Max
A	14.22	15.88
B	9.65	10.67
C	2.54	3.43
D	5.84	6.86
E	—	6.35
G	12.70	14.73
H	2.29	2.79
J	0.51	1.14
K	3.53 \varnothing	4.09 \varnothing
L	3.56	4.83
M	1.14	1.40
N	0.30	0.64
P	2.03	2.92
R	4.83	5.33

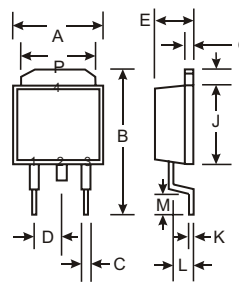


TO-263 / D²PAK



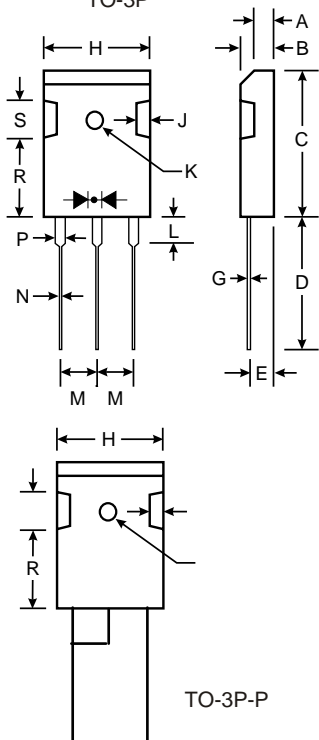
Dim	Min	Max
A	9.65	10.69
B	14.60	15.88
C	0.51	1.14
D	2.29	2.79
E	4.37	4.83
G	1.14	1.40
H	1.14	1.40
J	8.25	9.25
K	0.30	0.64
L	2.03	2.92
M	2.29	2.79

TO-252 / DPAK



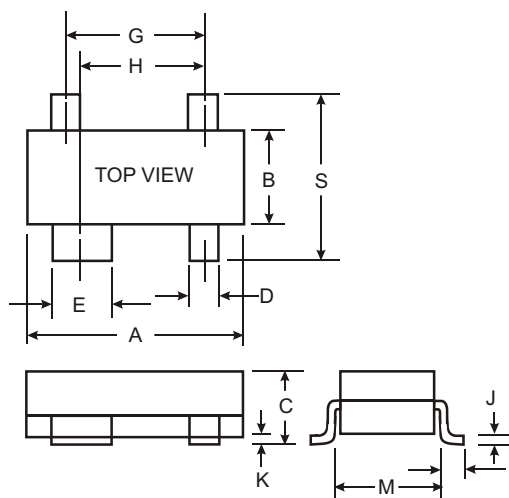
Dim	Min	Max
A	6.3	6.7
B	—	10
C	0.3	0.8
D	2.3 Nominal	
E	2.1	2.5
G	0.4	0.6
H	1.2	1.6
J	5.3	5.7
K	0.5 Nominal	
L	1.3	1.8
M	1.0	—
P	5.1	5.5

TO-3P



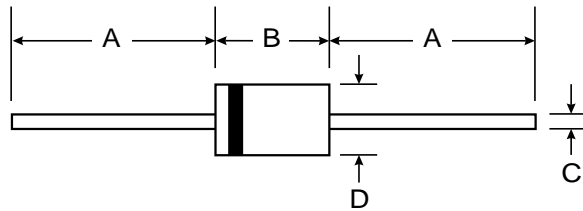
Dim	Min	Max
A	3.20	3.50
B	4.59	5.16
C	20.80	21.30
D	19.70	20.20
E	2.10	2.40
G	0.51	0.76
H	15.90	16.40
J	1.70	2.70
K	3.10 \varnothing	3.30 \varnothing
L	3.50	4.51
M	5.20	5.70
N	1.12	1.22
P	2.90	3.30
R	11.70	12.80
S	4.30 Typical	

SOT-343 / SOT-143



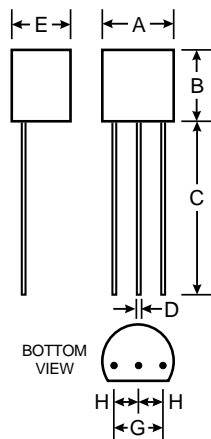
SOT-143		
Dim	Min	Max
A	2.80	3.04
B	1.20	1.40
C	0.80	1.20
D	0.37	0.46
E	0.76	0.89
G	1.92 BSC	
H	1.72 BSC	
J	0.085	0.130
K	0.051	0.127
L	0.25	0.55
M	1.00	1.69
S	2.10	2.64
All Dimensions in mm		

Axial Devices (Through-Hole)



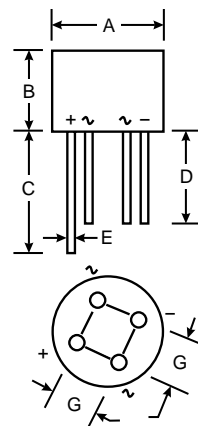
Dim	A		B		C		D	
	Min	Max	Min	Max	Min	Max	Min	Max
A-405	25.40	—	4.10	5.20	0.53	0.64	2.00	2.70
DO-35	25.40	—	—	4.00	—	0.60	—	2.00
DO-41 Plastic	25.40	—	4.06	5.21	0.71	0.864	2.00	2.72
DO-41 Glass	25.40	—	—	4.70	—	0.863	—	2.71
DO-15	25.40	—	5.50	7.62	0.686	0.889	2.60	3.60
DO-201	25.40	—	8.50	9.53	0.96	1.06	4.80	5.21
DO-201AD	25.40	—	7.20	9.50	1.20	1.30	4.80	5.30
R-6	25.40	—	8.60	9.10	1.20	1.30	8.60	9.10
T-1	25.40	—	2.60	3.20	0.53	0.64	2.20	2.60
5W	25.40	—	8.38	8.89	0.94	1.09	3.30	3.68
5KP	25.40	—	—	8.60	0.95	1.07	—	9.53
5KW	25.40	—	—	9.00	1.20	1.30	—	8.00

TO-92



Dim	Min	Max
A	4.32	4.83
B	4.32	4.78
C	12.50	15.62
D	0.36	0.56
E	3.15	3.94
G	2.29	2.79
H	1.14	1.40

WOG / AM

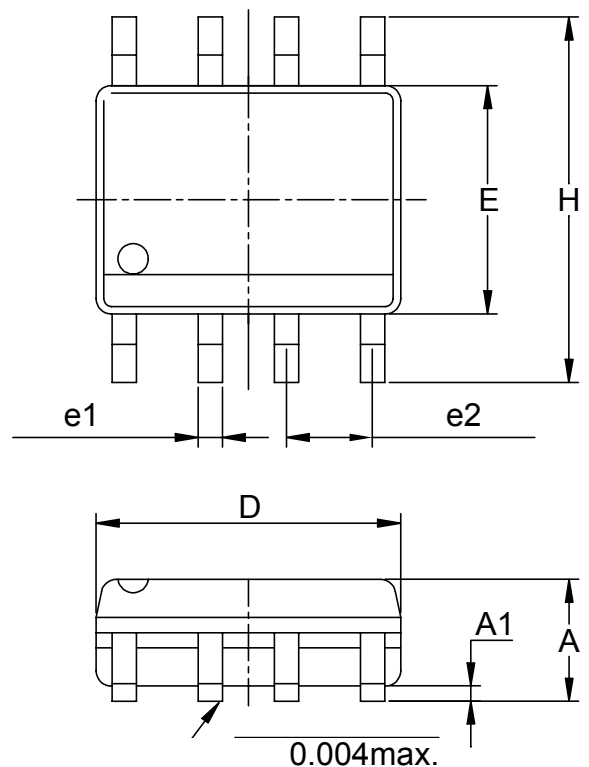


Dim	Min	Max
A	8.84	9.86
B	4.00	4.60
C	27.90	—
D	25.40	—
E	0.71	0.81
G	4.60	5.60

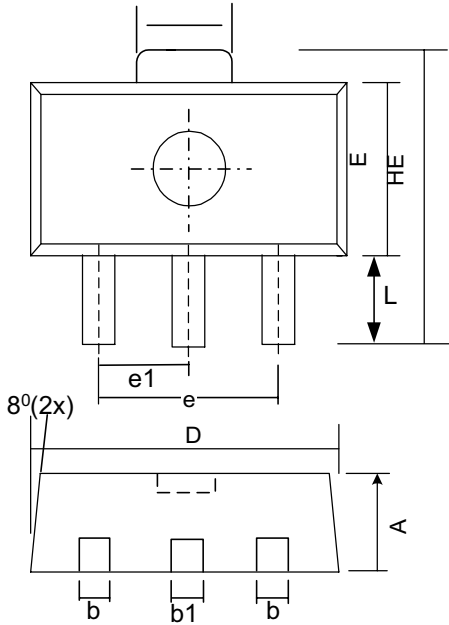
Lead configuration shown is for bulk product packaging only.
See ANSI/EIA-486 for Radial Tape specifications.

SOP-8 / TSSOP-8

Dim	Millimeters SOP-8 / TSSOP-8	
	Min.	Max.
A	1.35 / 1.0	1.75 / 1.2
A1	0.10 / 0.1	0.25 / 0.15
D	4.80 / 2.9	5.00 / 3.1
E	3.80 / 4.3	4.00 / 4.5
H	5.80 / 6.2	6.20 / 6.6
L	0.40 / -	1.27 / -
e1	0.33 / -	0.51 / -
e2	1.27BSC / 0.65BSC	

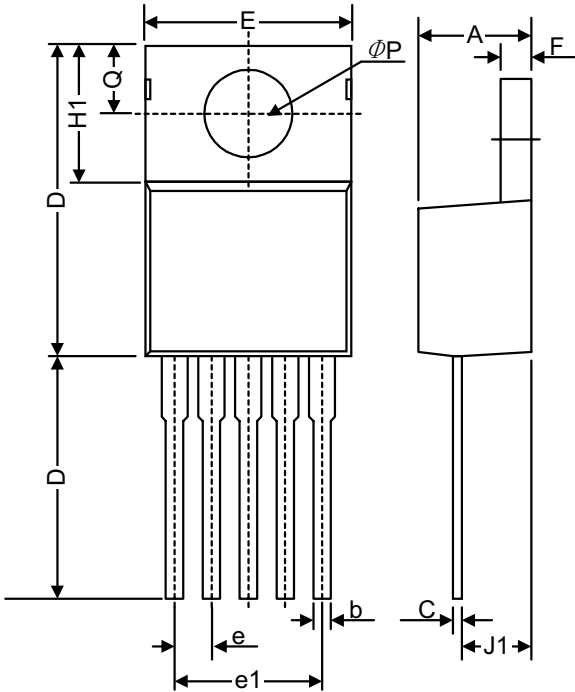


SOT89



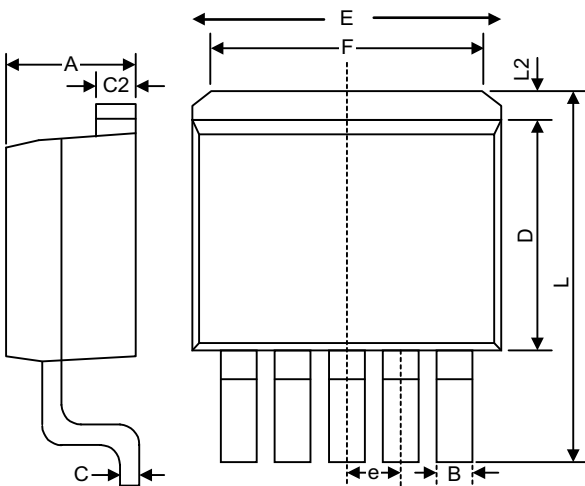
Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	1.40	1.50	1.60
B	0.36	0.42	0.48
b1	0.41	0.47	0.53
C	0.38	0.40	0.43
D	4.40	4.50	4.60
D1	1.40	1.60	1.75
E	2.90	3.00	3.10
e1	1.45	1.50	1.55
E	2.40	2.50	2.60
HE	3.94	-	4.25
L	0.80	-	1.20

TO-220-5

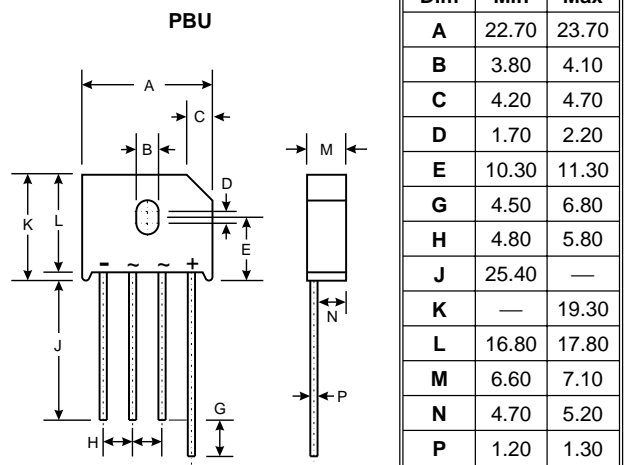
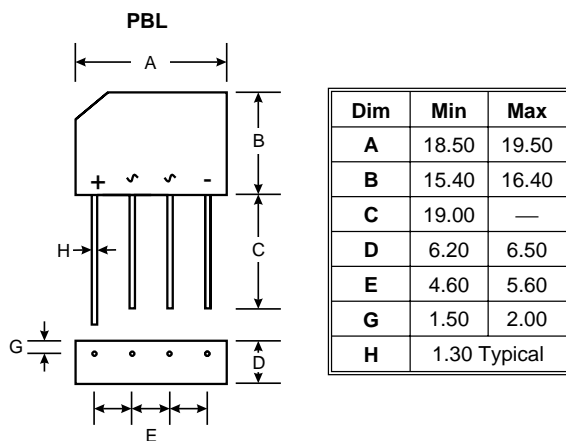
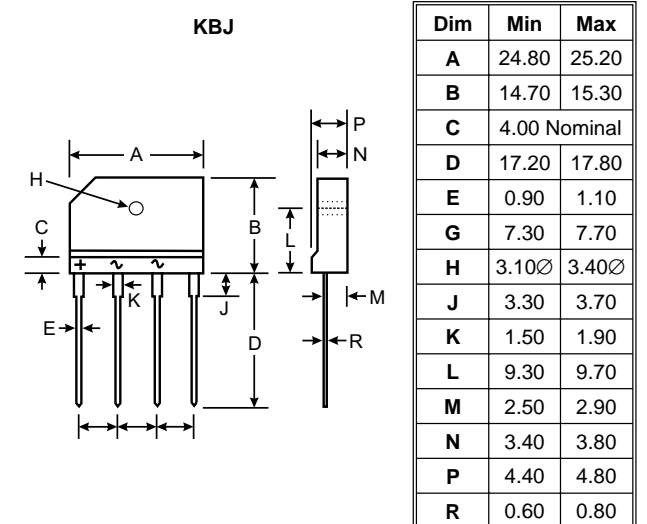
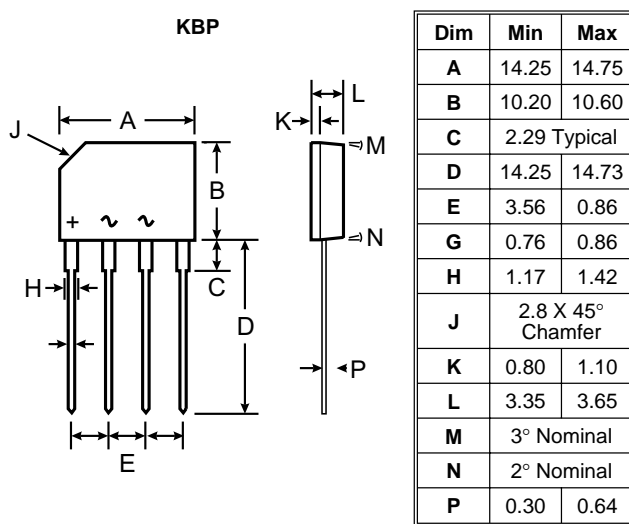
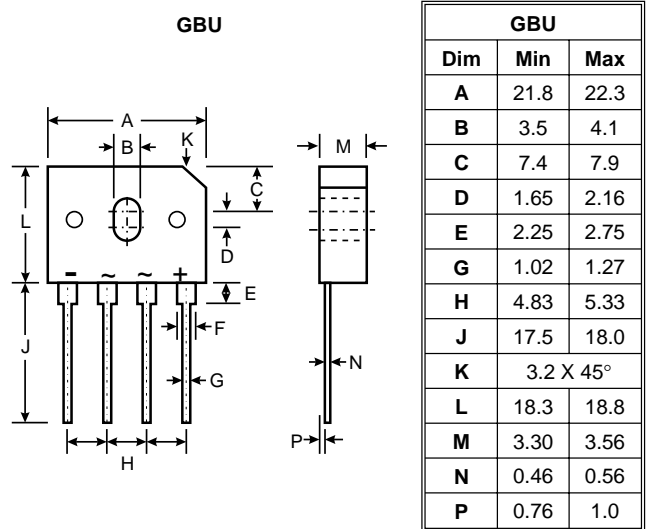
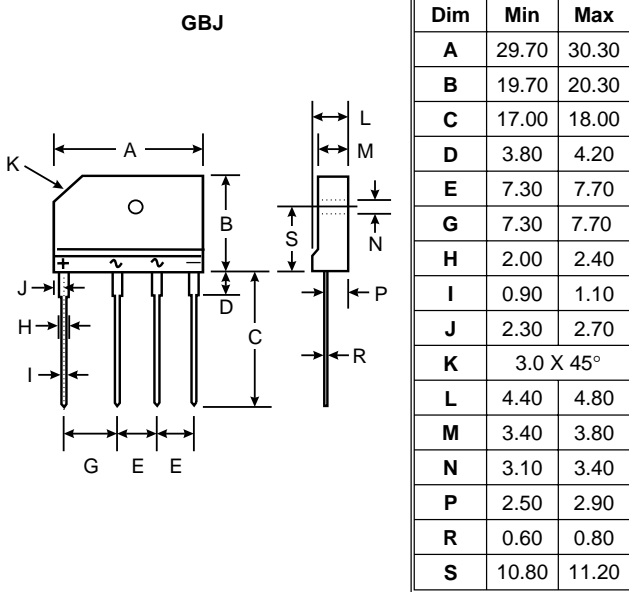


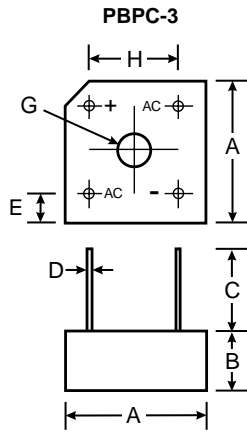
Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.06	4.8
b	0.76	1.02
C	0.36	0.64
D	14.22	15.49
E	9.78	10.54
e	1.57	1.85
e(1)	6.68	6.93
F	1.14	1.40
H(1)	5.46	6.86
J(1)	2.29	3.18
L	13.21	14.73
ΦP	3.68	3.94
Q	2.54	2.92

TO-263-5

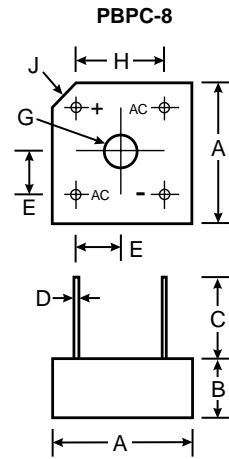


Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.06	4.83
B	0.76	1.02
C	0.36	0.64
C2	1.14	1.40
D	8.64	9.65
E	9.78	10.54
e	1.57	1.85
F	6.60	7.11
L	15.11	15.37
L2	-	1.40

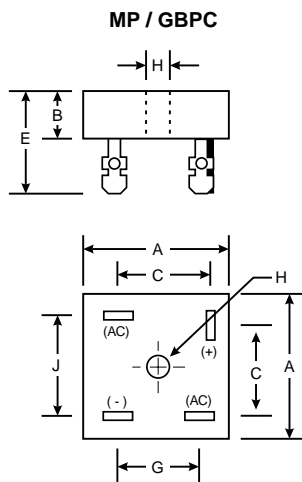




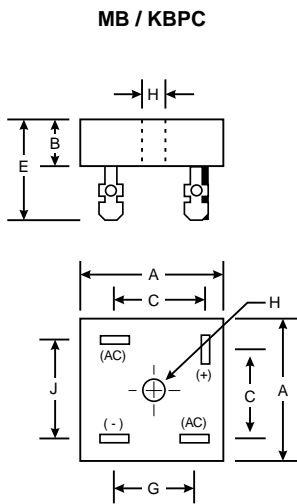
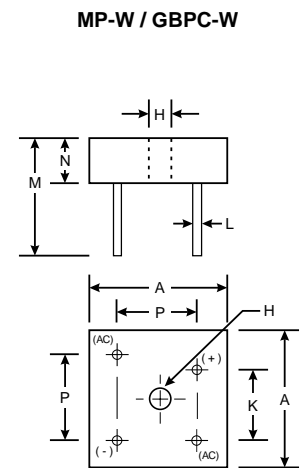
Dim	Min	Max
A	14.73	15.75
B	5.84	6.86
C	19.00	—
D	0.76Ø Typical	
E	1.70	2.70
G	Hole for #6 screw	
	3.60	4.00
H	10.30	11.30



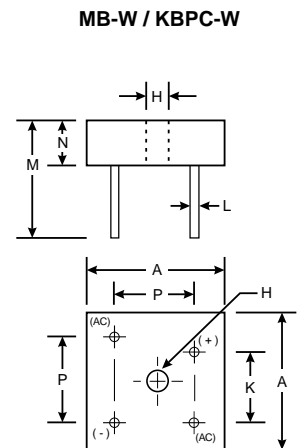
Dim	Min	Max
A	18.54	19.56
B	6.35	7.60
C	22.20	—
D	1.27Ø Typical	
E	5.33	7.37
G	3.60Ø	4.00Ø
H	12.70 Typical	
J	2.38 X 45° Typical	



Dim	Min	Max
A	28.30	28.80
B	7.40	8.00
C	16.10	17.10
E	18.80	21.30
G	13.80	14.80
H	Hole for #10 screw	
	4.85Ø	5.59Ø
J	17.60	18.60
K	10.90	11.90
L	0.97Ø	1.07Ø
M	26.4	—
N	7.40	8.00
P	17.60	18.60



Dim	Min	Max
A	28.40	28.70
B	10.97	11.23
C	15.50	17.60
E	22.86	25.40
G	13.30	15.30
H	Hole for #10 screw	
	4.85Ø	5.59Ø
J	17.10	19.10
K	10.40	12.40
L	0.97Ø Nominal	1.07Ø
M	30.50	—
N	10.97	11.23
P	17.10	19.10



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