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Transient Voltage Suppression Diodes (TVS Diodes)

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Wave Soldering

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TVS

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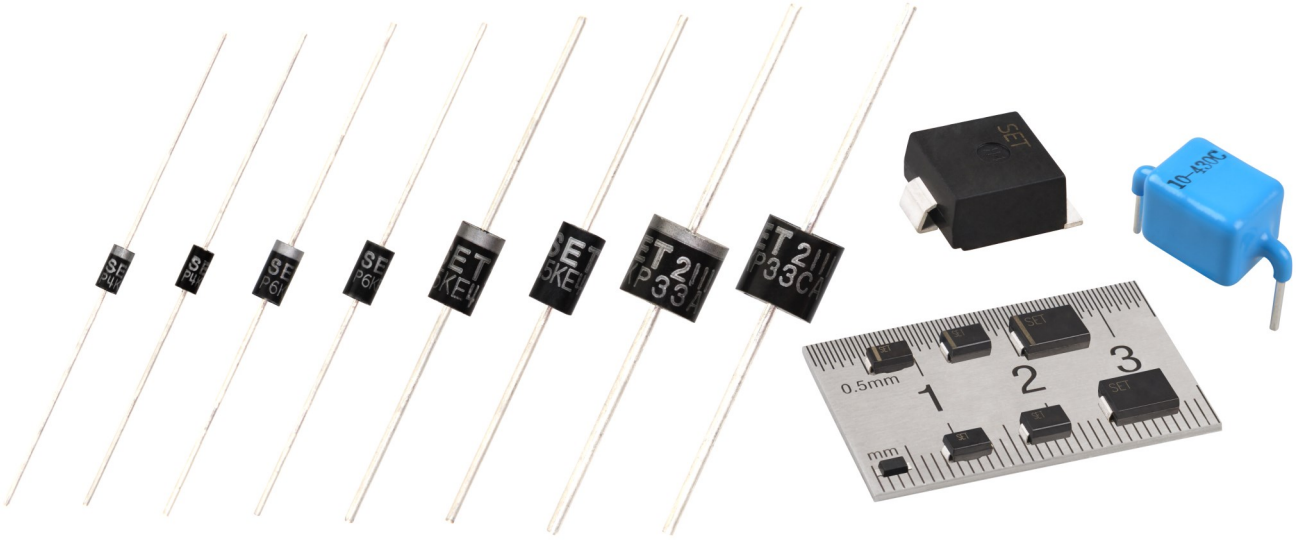

Features

- Fast Response
- Glass Passivated chip junction
- Halogen free and RoHS compliant
- Excellent clamping capability
- Low incremental surge resistance
- Low profile package
- ESD protection of data lines in accordance with IEC 61000-4-2(IEC801-2)
- EFT protection of data lines in accordance with IEC61000-4-4(IEC801-4)
- Plastic package has underwriters laboratory flammability rating 94 V-0

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Transient Voltage Suppressor (Surface Mount) Features Overview

Page / Model	DO-221AC	DO-214AA	DO-214AB	DO-214AC	SOD-123FL	SMTO-218										
							SMA6L	SACB	SMBJ	P6SMB						
Package Type	○	○	○	○	SMF	○	○	○	○	○	○	○	○	○	○	○
	○	○	○	SMAJ	P4SMF	○	○	○	○	○	○	○	○	○	○	○
	○	○	○	P4SMA	○	○	○	○	○	○	○	○	○	○	○	○
	○	○	○	SMA6J	○	○	○	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Product Outline (mm)	3.65 / 1.75			5.04 / 2.60			5.20 / 2.60		5.40 / 3.60							
	1.30			2.10			1.00		2.30							
V_R / V_{WM} (V) Reverse Stand-off Voltage	5.0 ~ 250	5.0 ~ 85	5.0 ~ 440	5.8 ~ 468	5.0 ~ 250			5.0 ~ 50	5.0 ~ 440	5.8 ~ 512						
P_{PPM} (W) (10/1000 μs) Rated Peak ImPulse Power Dissipation	200		400		600			500	600							
I_{PPM} (kA)(8/20 μs) Rated Peak ImPulse Current	○															
Operating Temperature (°C)	-55 to +150															

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Transient Voltage Suppressor (Surface Mount) Features Overview

Package Type \ Model	SMCJ	1.5SMC	3.0SMCJ	SMDJ	5.0SMDJ	SPC1	SPC3	SPC6	SPC10
DO-221AC	○	○	○	○	○	○	○	○	○
DO-214AA	○	○	○	○	○	○	○	○	○
DO-214AB	○	○	○	○	○	○	○	○	○
DO-214AC	○	○	○	○	○	○	○	○	○
SOD-123FL	○	○	○	○	○	○	○	○	○
SMTO-218	○	○	○	○	○				
Page									
Product Outline (mm)			7.94 / 5.90 / 2.34			18.27 / 14.26 / 7.09			
V_R / V_{WM} (V) Reverse Stand-off Voltage	5.0 ~ 440	5.8 ~ 512	5.0 ~ 440		12 ~ 170	380 / 430	66	58 ~ 76	58 ~ 86
P_{PPM} (W) (10/1000 μs) Rated Peak ImPulse Power Dissipation	1500		3000		5000		○		
I_{PPM} (kA)(8/20 μs) Rated Peak ImPulse Current			○			1	3	6	10
Operating Temperature (°C)	-55 to +150					-55 to +125			

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Transient Voltage Suppressor (Axial Lead) Features Overview

| Page | Model | | |

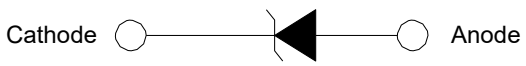
TVS Diodes

Transient Voltage Suppression Diodes

Product Description

TVS Diodes are used to protect sensitive circuit from high-voltage transients. Their p-n junctions have a larger cross-sectional area than those of a normal diode, allowing them to conduct large currents to ground without damage. SETsafe | SETfuse supplies TVS Diodes with peak power ratings from 200 W to 30 kW, and reverse standoff voltages from 5.0 V to 512 V.

Functional Diagram



Uni-Directional

Bi-Directional

Applications

- Communication Equipment
- Security & Protection
- Industrial Control Equipment
- Power Supply
- Automotive Electronics
- New Energy
- Lightning Protection

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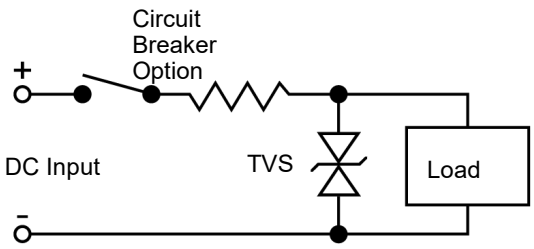
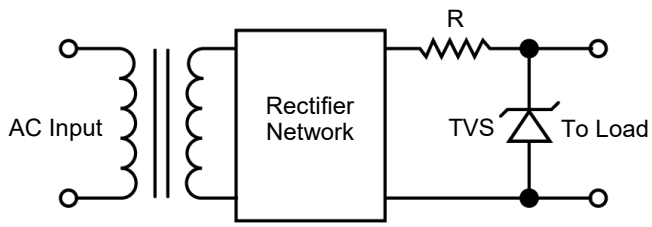
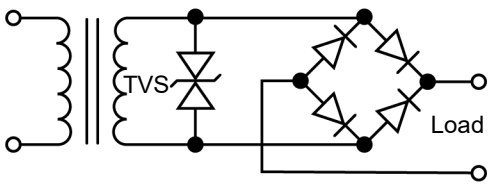
DC Supply Protection



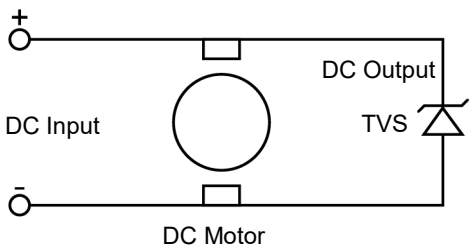
DC Load Protection



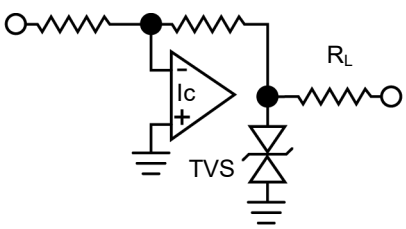
AC Supply Protection



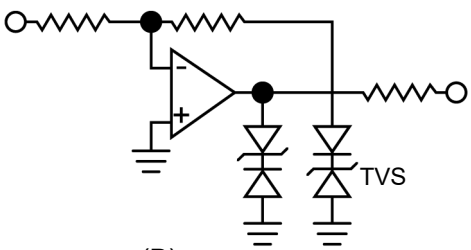
Electo-Magnetic Interference Limiting



Amplifier Protection



(A)



(B)

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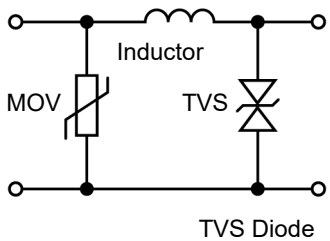
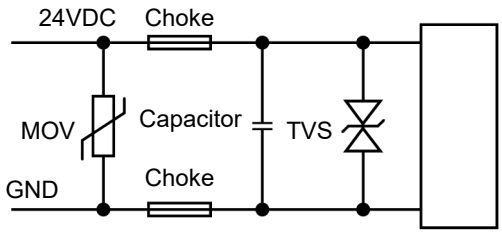
Combined MOV Varistor and TVS Diode Protection Scenarios

MOV + TVS Combination

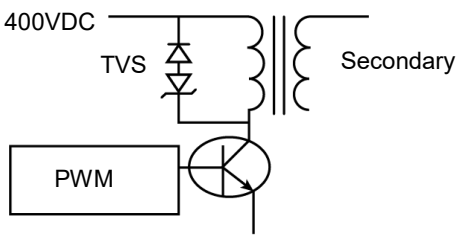


MOV+ Choke + TVS Combination

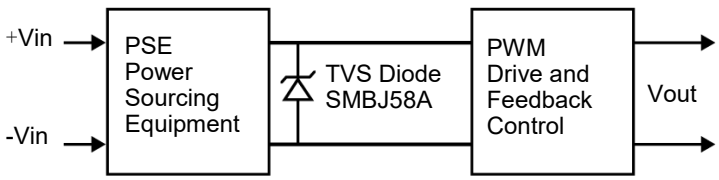


TVS Diode recommended models
SMBJ28A/SMBJ30A
SMCJ28A/SMCJ30A

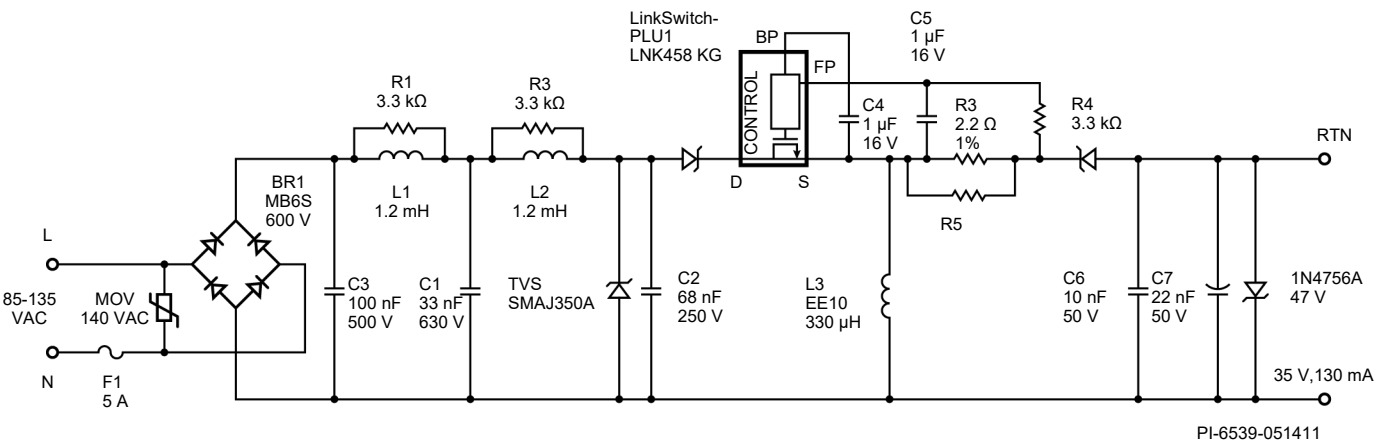
Pulse Width Modulated (PWM)Drive Protection



Power Over Ethernet (POE) Protection



LED Drive Protection



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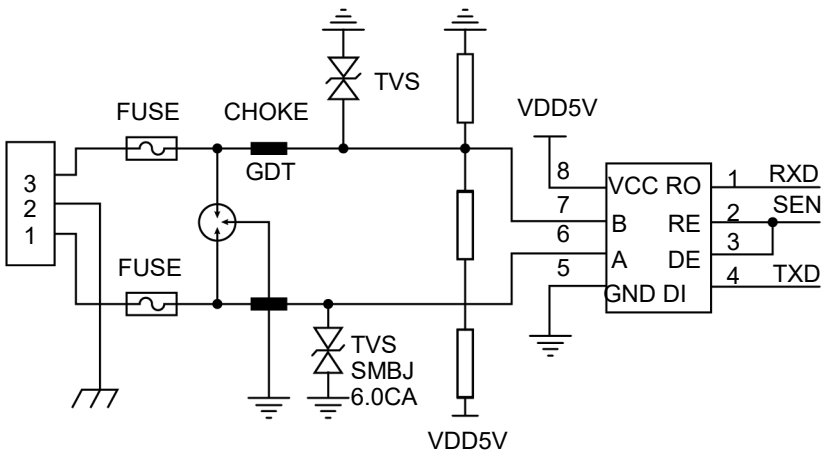
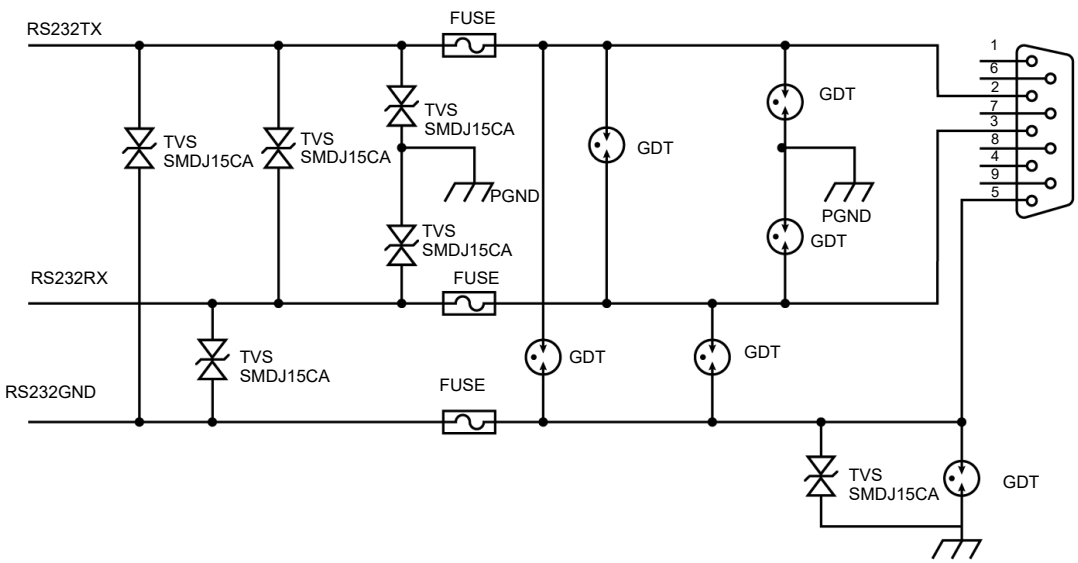
RS485 Interface Protection



RS232 Interface Protection with High Surge Requirement



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TVS Diode Selection Checklist

1. Normal operating voltage type in DC or AC:_____

2. Device Type Required : ( ) Uni-directional ( ) Bi-directional

3. Normal operating voltage in volts:_____

4. Rated random recurring peak impulse current(I_{ppm}):_____

5. Maximum clamping voltage (V_c):_____

6. Rated random recurring peak impulse power dissipation (P_{ppm}): _____

7. Product packing type (package):_____

8. Operating temperature:_____

TVS

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Glossary

Item	Description
V_C	**Clamping Voltage** Voltage across TVS in a region of low differential resistance that serves to limit the voltage across the device terminals.
V_R	**Reverse Stand-off Voltage** Maximum voltage that can be applied to the TVS without operation. NOTE : It is also shown as V_{WM} (maximum working voltage (maximum d.c. voltage)) and known as rated stand-off voltage (V_{so}).
I_R	**Reverse Leakage Current** Current measured at V_R. NOTE : Also shown as I_D for stand-by current.
V_{BR}	**Breakdown Voltage** Voltage across TVS at a specified current I_T in the breakdown region.
I_{PPM}	**Rated Random Recurring Peak Impulse Current** Maximum-rated value of random recurring peak impulse current that may be applied to a device.
$P_{M(AV)}$	**Rated Average Power Dissipation** Maximum-rated value of power dissipation resulting from all sources, including transients and standby current, averaged over a short period of time.
P_{PPM}	**Rated Random Recurring Peak Impulse Power Dissipation** Maximum-rated value of the product of rated random recurring peak impulse current (I_{PPM}) multiplies by specified maximum clamping voltage (V_C).
C_J	**Capacitance** Capacitance across the TVS measured at a specified frequency and voltage.
V_{FS}	**Peak Forward Surge Voltage** Peak voltage across an TVS for a specified forward surge current (I_{FS}) and time duration. NOTE : Also shown as V_F.
I_{FS}	**Forward Surge Current** Pulsed current through TVS in the forward conducting region. NOTE : Also shown as I_F.
$\alpha_{V(BR)}$	**Temperature Coefficient of Breakdown Voltage** The change of breakdown voltage divided by the change of temperature.
I_{PP}	**Peak pulse Current** Peak pulse current value applied across the TVS to determine the clamping voltage V_C for a specified wave shape.
I_T	**Pulsed D.C. Test Current** Test current for measurement of the breakdown voltage V_{BR}. This is defined by the manufacturer and usually given in milliamperes with a pulse duration of less than 40 ms. NOTE : Also shown as I_{BR}.

—(GB-T 18802.321 / IEC 61643-321 / JESD210A)

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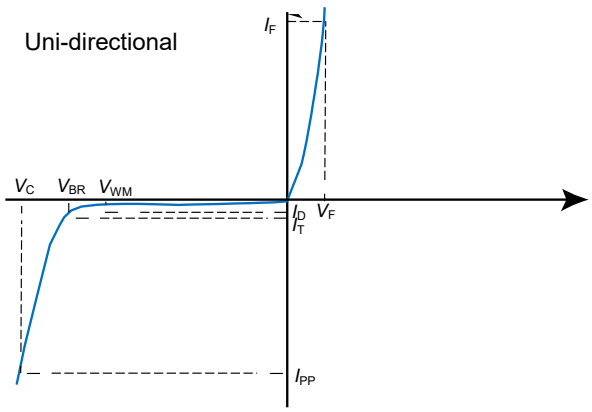
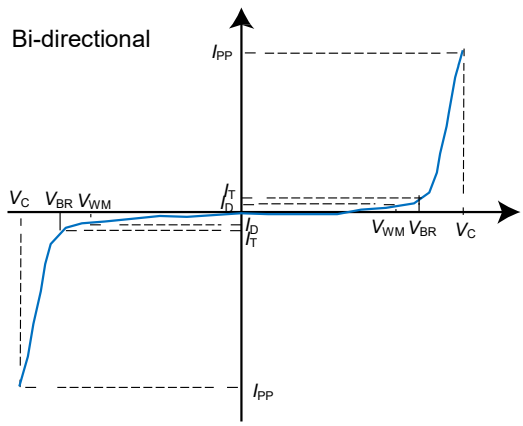
I-V Curve Characteristics





Performance Curve for Reference(T_A = 25 °C unless otherwise noted)

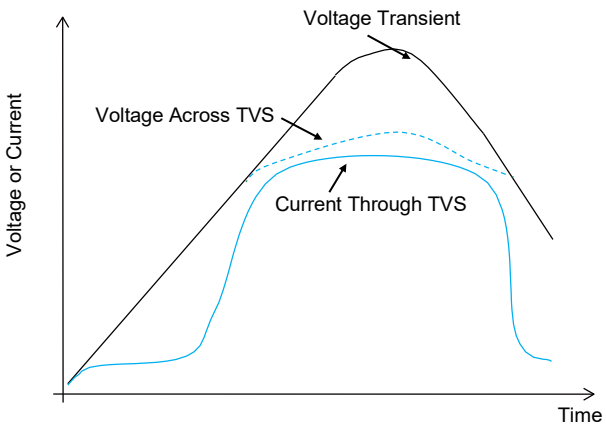


FIGURE.1 TVS Transients Clamping Waveform

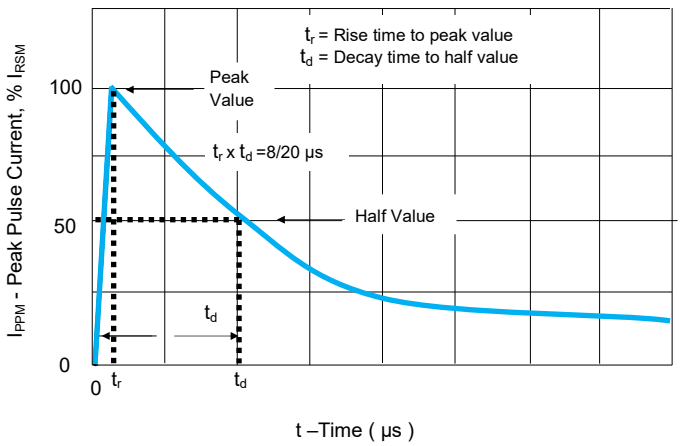


FIGURE.2 Pulse Waveform(8/20 μS)

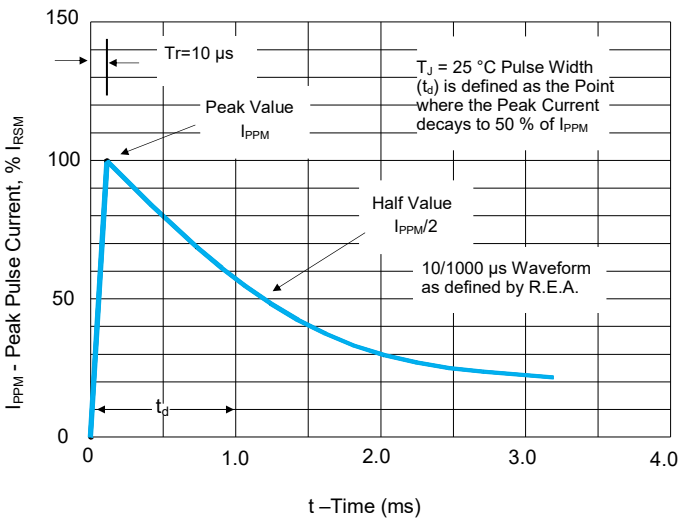


FIGURE.3 Pulse Waveform(10/1000 μS)

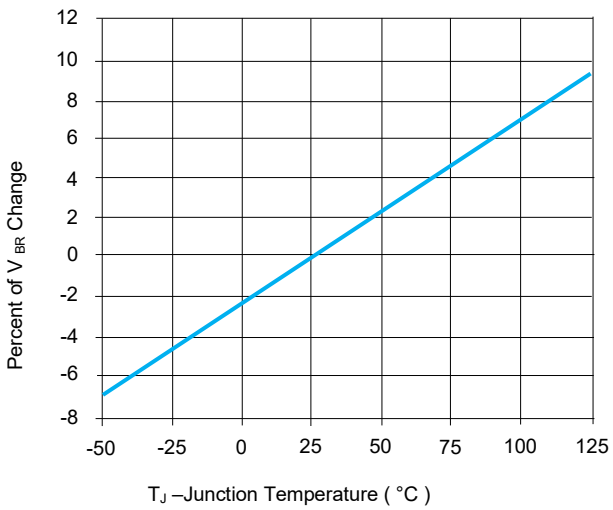


FIGURE.4 Typical Curve of V_{BR} Change VS T_J Change

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Part Numbering System

Product Series
SMF
P4SMF
SMAJ
P4SMA
SMA6J
SMA6L
SACB
SMBJ
P6SMB
SMCJ
1.5SMC
3.0SMCJ
SMDJ
5.0SMDJ

XXXXX xxx C A

- A: 5% V_{BR} Voltage tolerance
- C: C: Bi-directional; None : uni-directional
- xxx: Reverse Stand-off Voltage
- XXXXX: Product Series

SPC X - XXX C

- SPC: Product Series SPC -SET Power TVS High Current Diode
- X: Number
- XXX: Reverse Stand Off Voltage
- C: C:Bi-directional

Number	meaning
1	I_{PP} 1 kA
3	I_{PP} 3 kA
6	I_{PP} 6 kA
10	I_{PP} 10 kA

TVS

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Part Numbering System

XXXXX xxx C A — XX

Product Series
P4KE
SAC
P6KE
1.5KE
LCE
5KP
15KPA
20KPA
30KPA

- XX: Package Type
- A: 5% V_{BR} Voltage tolerance
- C: C : Bi-directional; None : uni-directional
- xxx: Reverse Stand-off Voltage

SPCL X — XXX C — Y — XXX

- SPCL: Product Series — SPCL -SET Power TVS High Current Diode
- X: Number (meaning below)
- XXX: Reverse Stand Off Voltage
- C: C:Bi-directional
- Y: Option Code: Blank: Blue coating; -Y: Yellow coating
- XXX: Package Type

Number	meaning
1	I_{PP} 1 kA;
3	I_{PP} 3 kA
6	I_{PP} 6 kA
10	I_{PP} 10 kA
15	I_{PP} 15 kA
20	I_{PP} 20 kA

TVS

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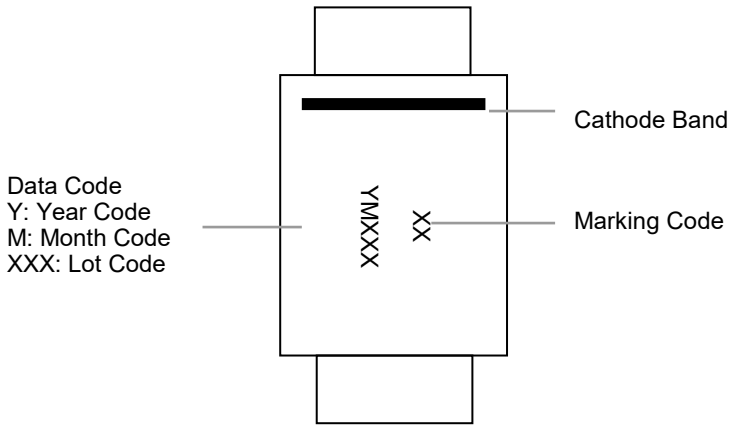
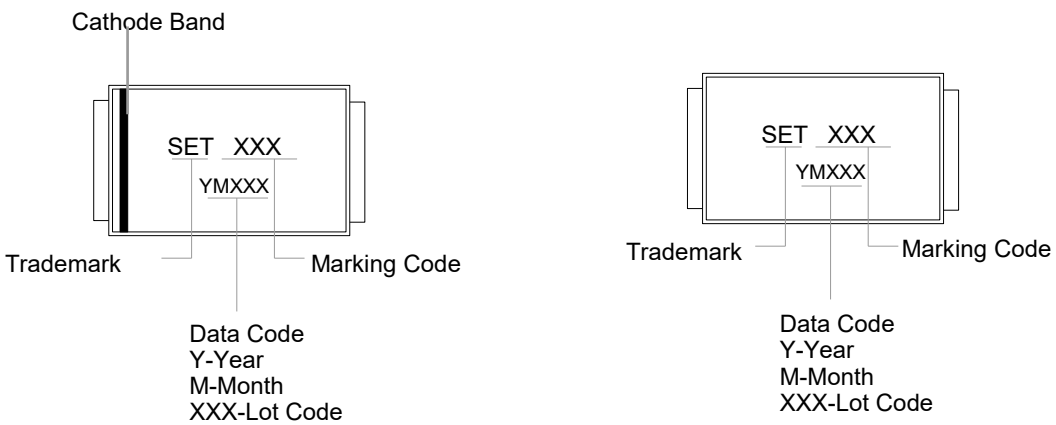
Marking

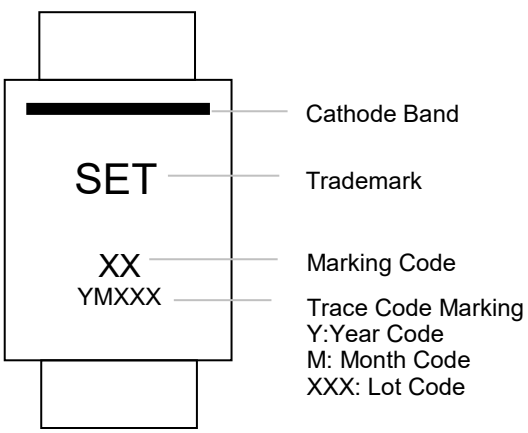
SMF / P4SMF Series



SMAJ / P4SMA / SMA6J Series



SMA6L Series



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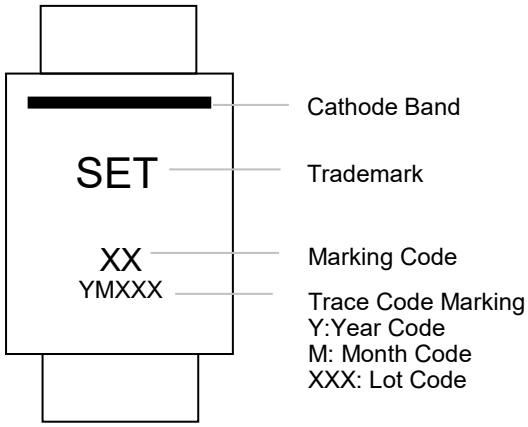
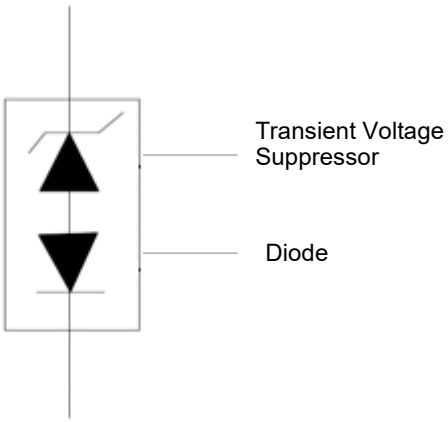
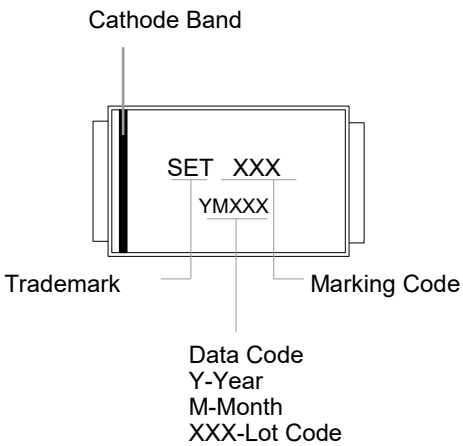
SACB Series

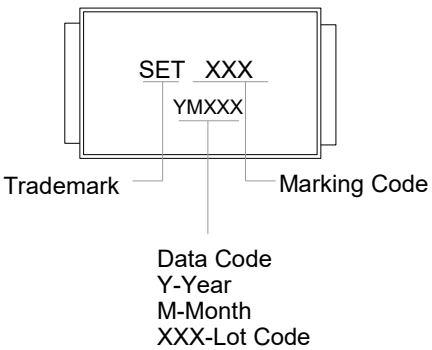


Functional Diagram

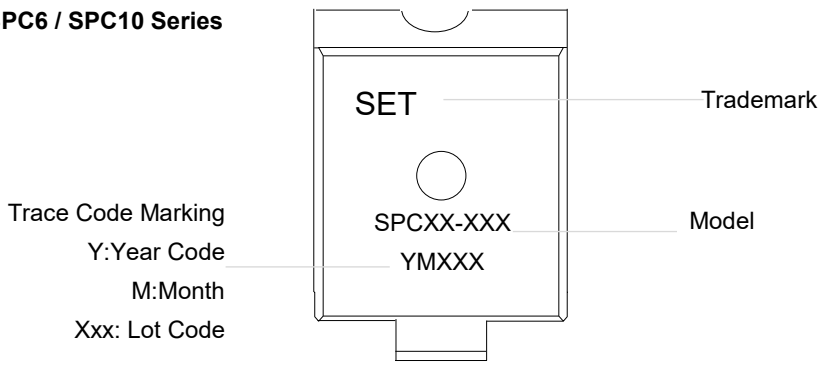


SMBJ / P6SMB / SMCJ / 1.5SMC / 3.0SMCJ / SMDJ / 5.0SMD Series





SPC1 / SPC3 / SPC6 / SPC10 Series



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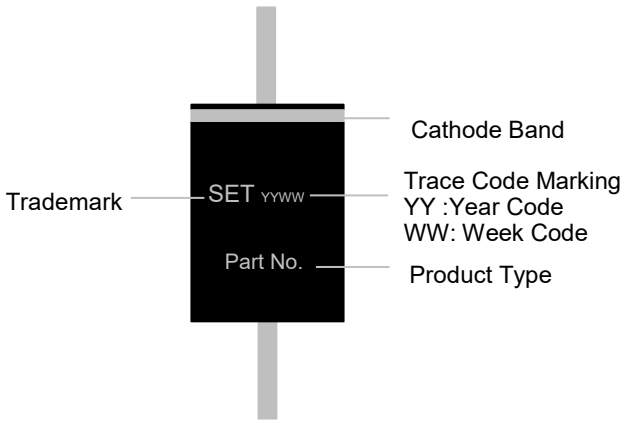
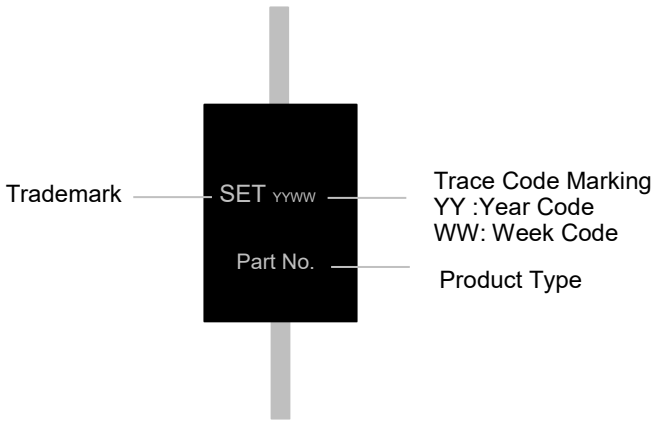
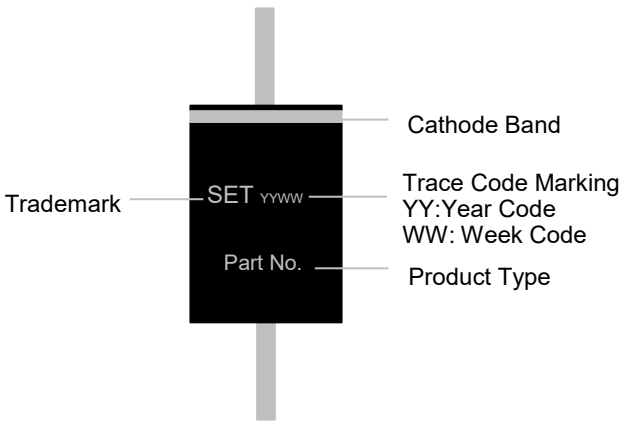
P4KE Series

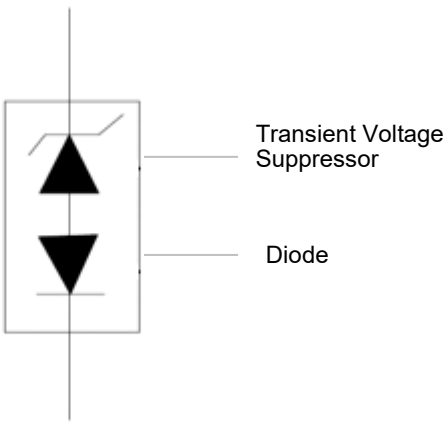




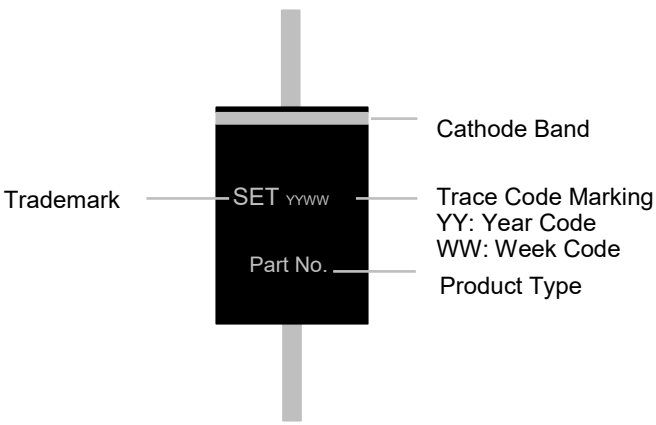
SAC / LCE Series

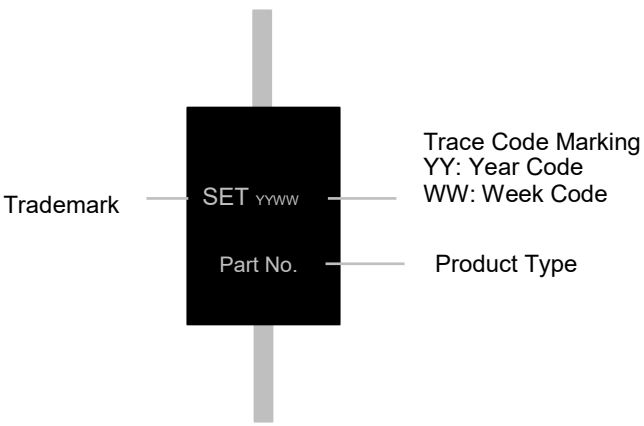


Functional Diagram



P6KE / 1.5KE Series





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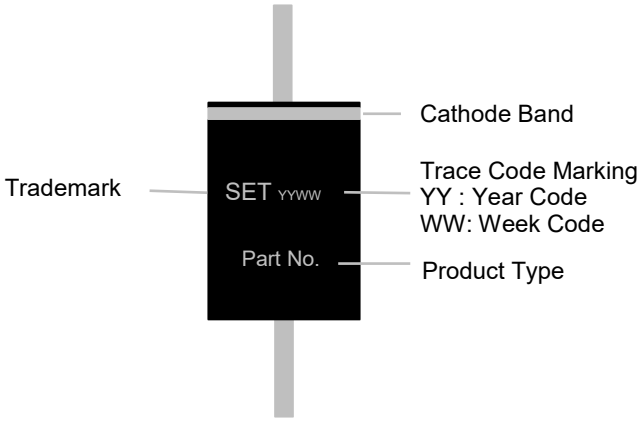
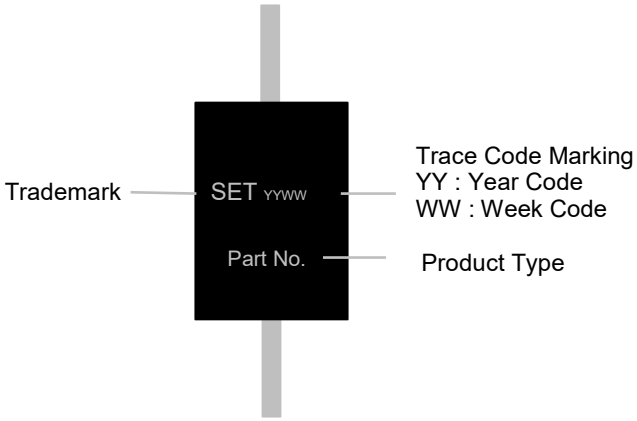
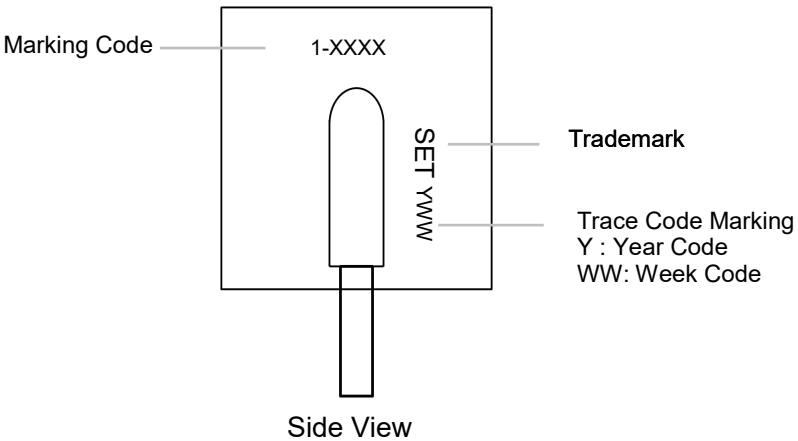
5KP / 15KPA / 20KPA / 30KPA Series



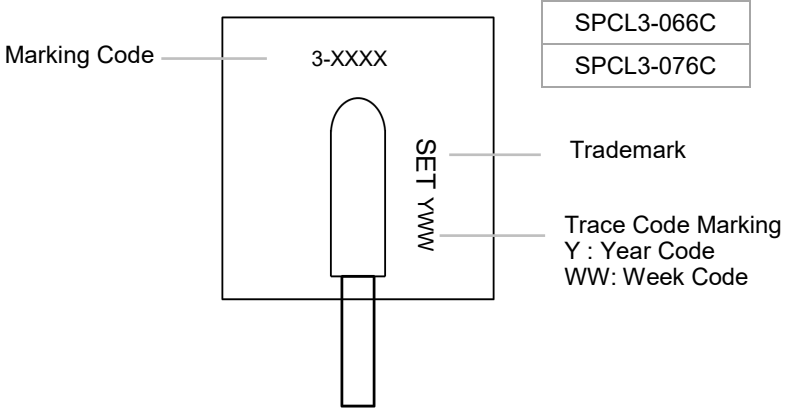


SPCL1 Series



SPCL3 Series

Apply to P/N
SPCL3-015C
SPCL3-025C
SPCL3-030C
SPCL3-038C
SPCL3-058C
SPCL3-066C
SPCL3-076C



Type 1 - Side View

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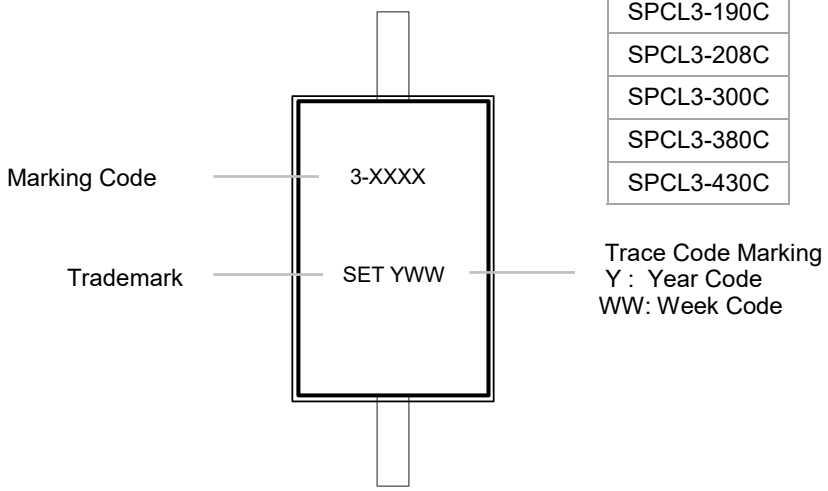
SPCL3 Series

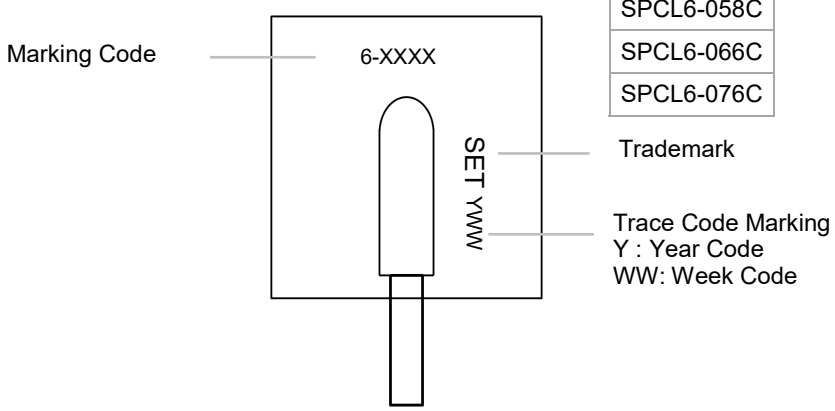
Apply to P/N
SPCL3-150C
SPCL3-170C
SPCL3-190C
SPCL3-208C
SPCL3-300C
SPCL3-380C
SPCL3-430C



Type 2 - Top View

SPCL6 Series

Apply to P/N
SPCL6-030C
SPCL6-033C
SPCL6-038C
SPCL6-058C
SPCL6-066C
SPCL6-076C



Type 1 - Side View

TVS

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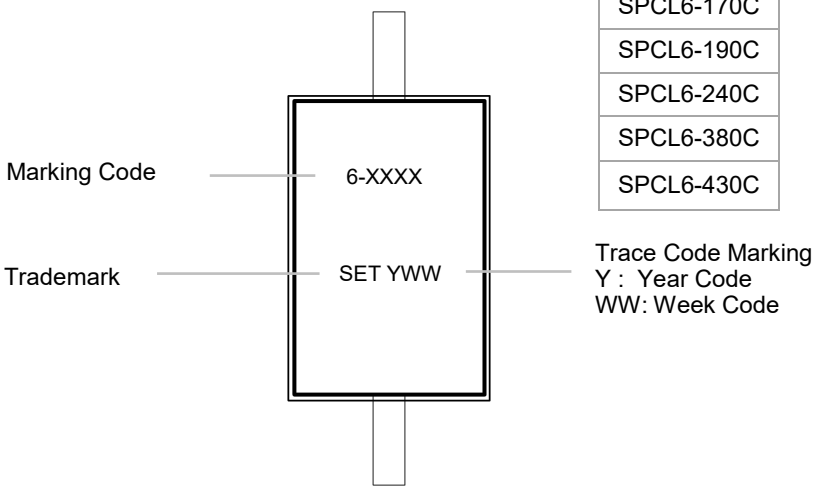
SPCL6 Series

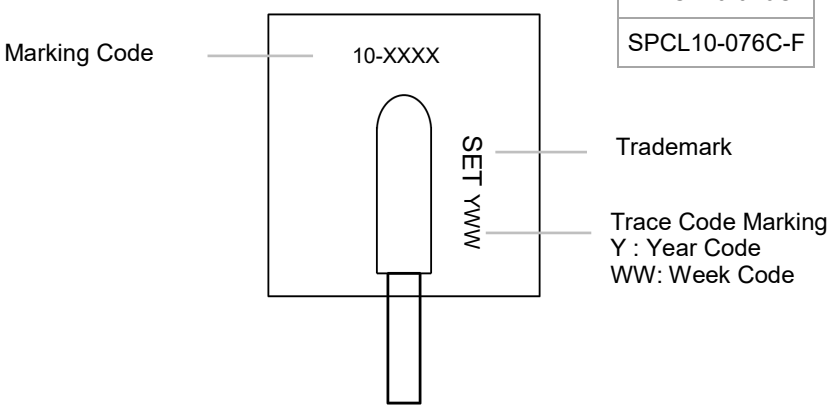


Apply to P/N
SPCL6-170C
SPCL6-190C
SPCL6-240C
SPCL6-380C
SPCL6-430C

Type 2 - Top View

SPCL10 Series

Apply to P/N
SPCL10-015C
SPCL10-030C
SPCL10-045C
SPCL10-058C
SPCL10-066C
SPCL10-076C
SPCL10-076C-F



Type 1 - Side View

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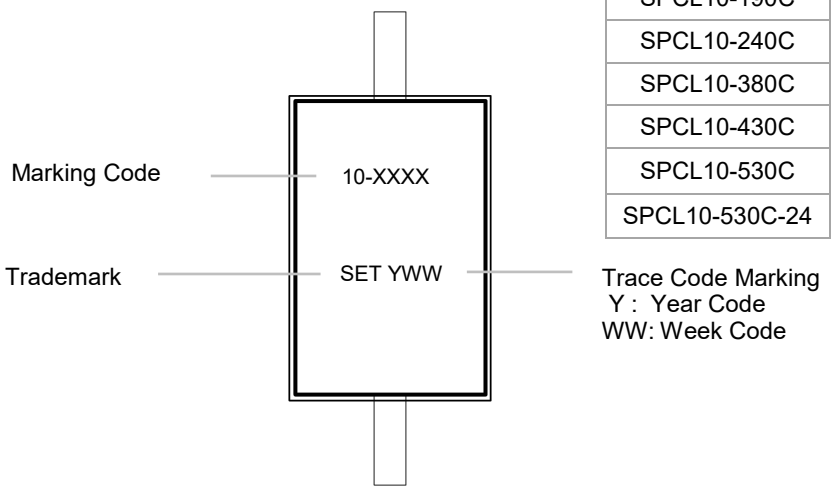
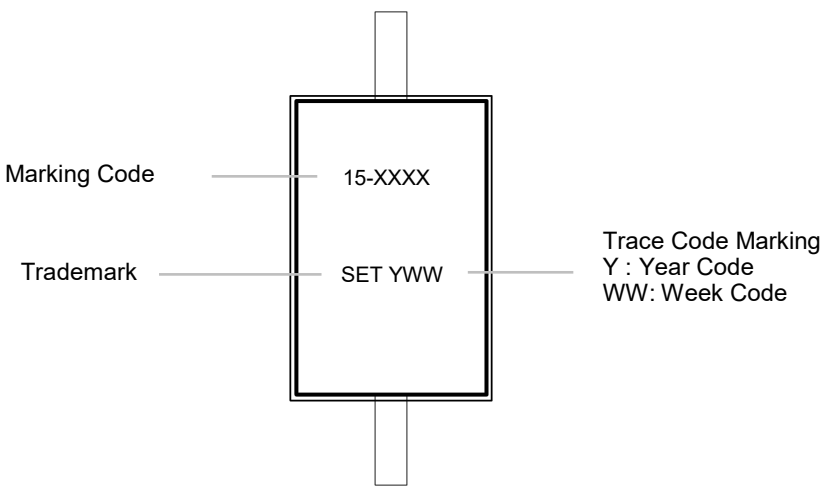
SPCL10 Series



Apply to P/N
SPCL10-170C
SPCL10-190C
SPCL10-240C
SPCL10-380C
SPCL10-430C
SPCL10-530C
SPCL10-530C-24

Type 2 - Top View

SPCL15 Series



Top View

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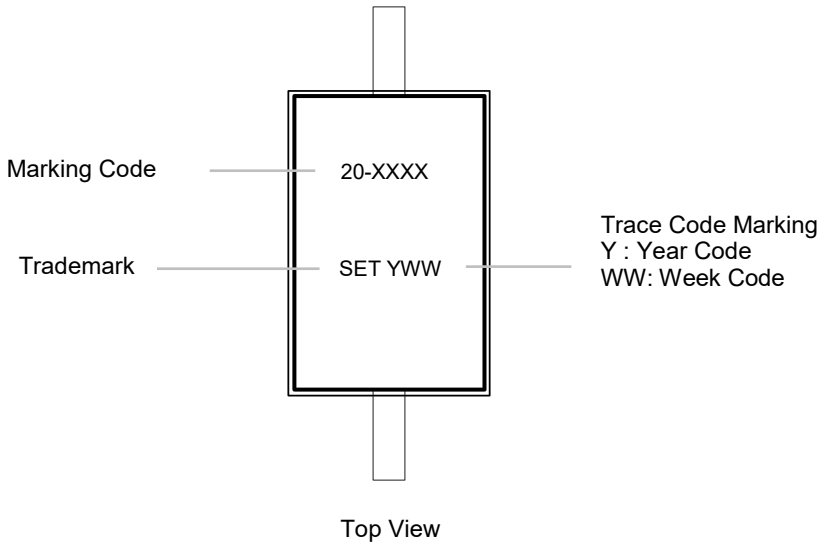
SPCL20 Series



TVS

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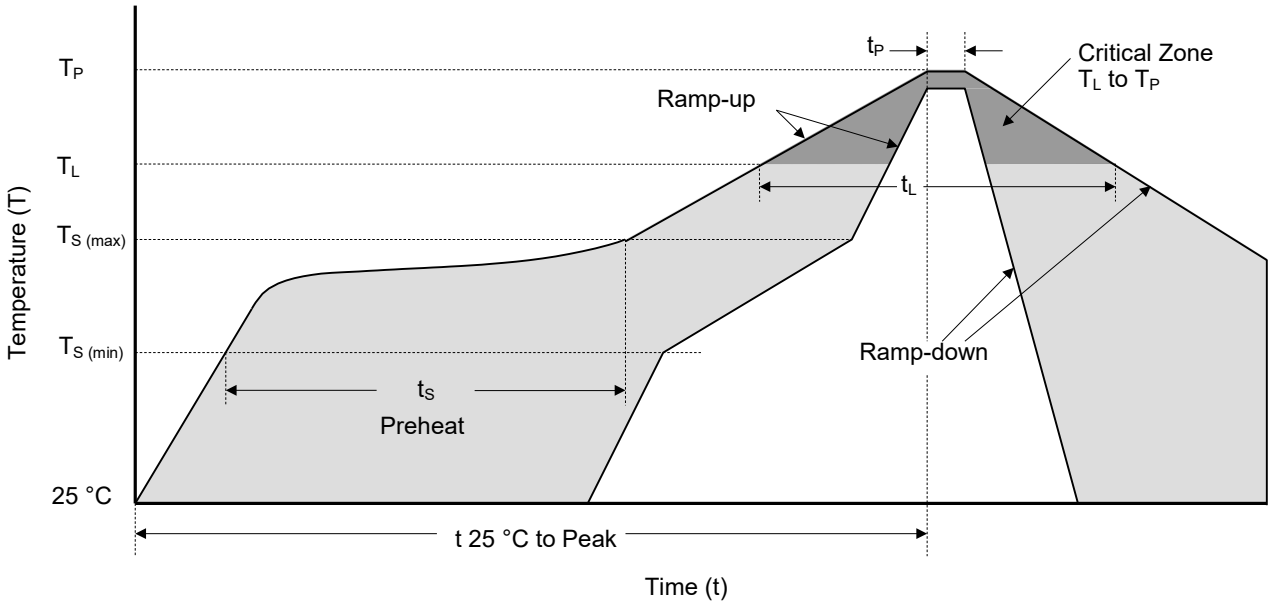
Reflow Soldering Parameter _ For Surface Mount Product



Reflow Soldering Parameters		Lead-Free Assembly
Pre-heat	Temperature Min ($T_{S\ (min)}$)	150 °C
	Temperature Max ($T_{S\ (max)}$)	200 °C
	Time (min to max) (t_s)	60 ~120 seconds
Average Ramp Up Rate (Liquidus Temp (TL) to Peak		3 °C / second max.
T_S (max) to T_L Ramp-up Rate		3 °C / second max.
Reflow	Temperature (T_L) (Liquidus)	217 °C
	Time (min to max) (t_L)	60 ~ 150 seconds
Peak Temperature (T_P)		Table 1
Time of within 5 °C of Actual Peak Temperature (t_P)		20-40 seconds
Ramp-down Rate		6 °C / second max.
Time from 25 °C to Peak Temperature		8 minutes max.
Do Not Exceed		260 °C

Table 1
Package Classification reflow temperature

Package Thickness	Volume (mm^3) < 350	Volume (mm^3) 350 - 2000	Volume (mm^3) > 2000
＜ 1.6 mm	260 + 0 °C	260 + 0 °C	260 + 0 °C
1.6 mm ~2.5 mm	260 + 0 °C	250 + 0 °C	245 + 0 °C
⩾ 2.5 mm	250 + 0 °C	245 + 0 °C	245 + 0 °C

Note:
The device manufacturer / supplier shall assure process compatibility and the stated classification temperature at the rated MSL level.

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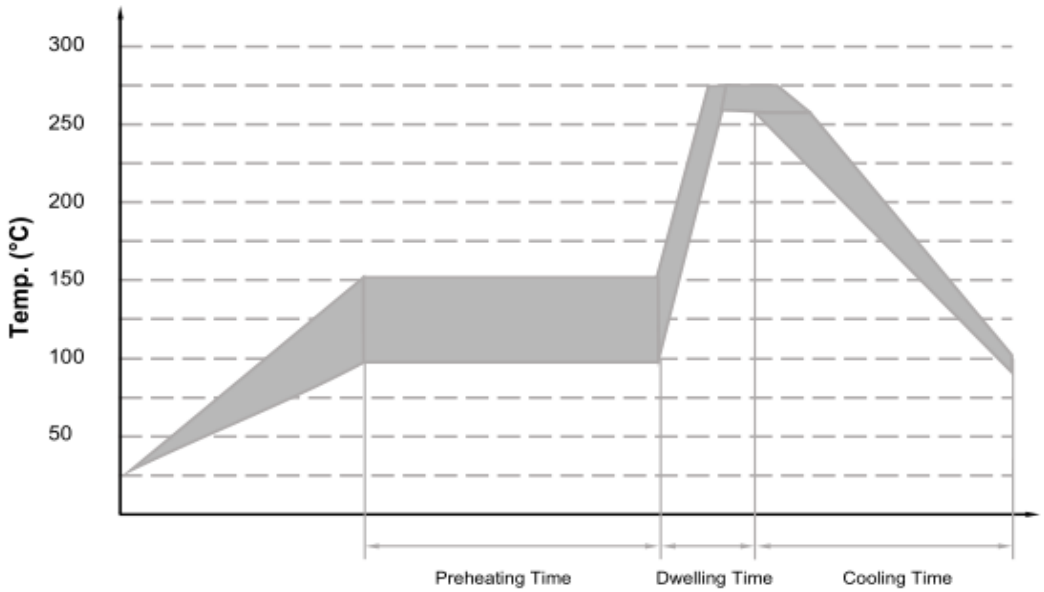
Wave Soldering Parameter (Solder Dipping) _ For Axial Lead Product



Peak Temperature	260 °C
Dipping Time	10 seconds
Soldering Number	1 time

TVS

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ATTENTION

Usage

1.TVS must be operated in the specified ambient temp.

2.Do not clean the TVS with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon, to avoid damaging the encapsulating layer.

3.Please do not apply severe vibration, shock or pressure to TVS, to avoid element cracking.

Replacement

1.If TVS is visually damaged, please replace it.

2.TVS is a non-repairable product. For safety sake, please use equivalent TVS for replacement.

Storage

1.Storage Temp. Range: (-55 to 150) °C.

2.Do not store the TVS at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder- ability of the lead wires. The product shall be used up within 1 year after receiving the goods.

Environmental Conditions

1.TVS should not be exposed to the open air, nor direct sunshine.

2.TVS should avoid rain, water vapor or other condition of high temp. and high humidity.

3.TVS should avoid sand dust, salt mist, or other harmful gases.

Max. Typical Capacitance of TVS

The typical capacitance of TVS is listed in the specifications. Designers may refer to it when designing TVS in High frequency circuit.

Installation Mechanical Stress

1.Do not knock TVS when installing, to avoid mechanical damage.

2.Please do not apply severe vibration, shock or pressure to TVS, to avoid surface resin or element cracking.

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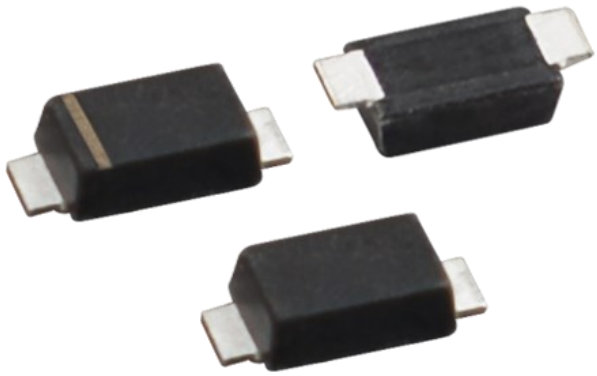
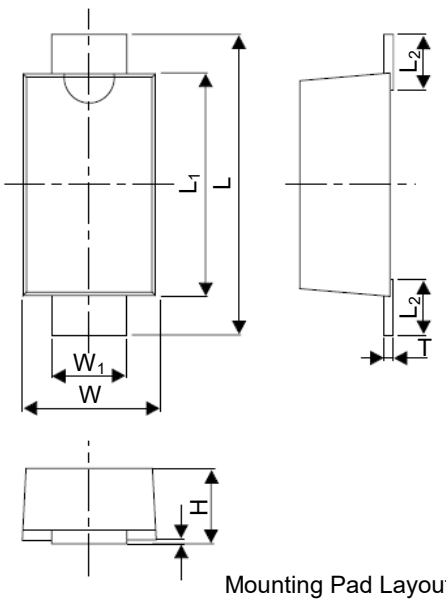
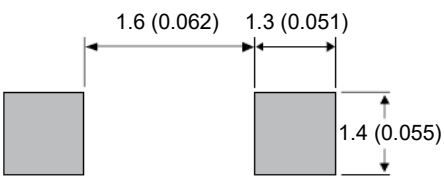


Package Outline Dimensions (SOD-123)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L_1	2.70	2.90	0.1060	0.1140
L	3.40	3.90	0.1339	0.1535
W_1	0.70	1.20	0.0275	0.0472
W	1.50	2.00	0.0591	0.0787
L2	0.35	0.90	0.0138	0.0354
T	0.05	0.26	0.0020	0.0102
H	1.20	1.40	0.0470	0.0550

Mounting Pad Layout



SOD-123FL

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMF3.3A	-	UZ	-	5.2	6.0	10	3.3	50	25	8.0
SMF5.0A	SMF5.0CA	AE	HE	6.40	7.00	10	5.0	400.0	21.7	9.2
SMF6.0A	SMF6.0CA	AG	HG	6.67	7.37	10	6.0	400.0	19.4	10.3
SMF6.5A	SMF6.5CA	AK	HK	7.22	7.98	10	6.5	250.0	17.9	11.2
SMF7.0A	SMF7.0CA	AM	HM	7.78	8.60	10	7.0	100.0	16.7	12.0
SMF7.5A	SMF7.5CA	AP	HP	8.33	9.21	1	7.5	50.0	15.5	12.9
SMF8.0A	SMF8.0CA	AR	HR	8.89	9.83	1	8.0	25.0	14.7	13.6
SMF8.5A	SMF8.5CA	AT	HT	9.44	10.40	1	8.5	10.0	13.9	14.4
SMF9.0A	SMF9.0CA	AV	HV	10.00	11.10	1	9.0	2.5	13.0	15.4
SMF10A	SMF10CA	AX	HX	11.10	12.30	1	10.0	2.5	11.8	17.0
SMF11A	SMF11CA	AZ	HZ	12.20	13.50	1	11.0	2.5	11.0	18.2
SMF12A	SMF12CA	BE	IE	13.30	14.70	1	12.0	2.5	10.1	19.9
SMF13A	SMF13CA	BG	IG	14.40	15.90	1	13.0	1.0	9.3	21.5
SMF14A	SMF14CA	BK	IK	15.60	17.20	1	14.0	1.0	8.6	23.2
SMF15A	SMF15CA	BM	IM	16.70	18.50	1	15.0	1.0	8.2	24.4
SMF16A	SMF16CA	BP	IP	17.80	19.70	1	16.0	1.0	7.7	26.0
SMF17A	SMF17CA	BR	IR	18.90	20.90	1	17.0	1.0	7.2	27.6
SMF18A	SMF18CA	BT	IT	20.00	22.10	1	18.0	1.0	6.8	29.2
SMF20A	SMF20CA	BV	IV	22.20	24.50	1	20.0	1.0	6.2	32.4
SMF22A	SMF22CA	BX	IX	24.40	26.90	1	22.0	1.0	5.6	35.5
SMF24A	SMF24CA	BZ	IZ	26.70	29.50	1	24.0	1.0	5.1	38.9
SMF26A	SMF26CA	CE	JE	28.90	31.90	1	26.0	1.0	4.8	42.1
SMF28A	SMF28CA	CG	JG	31.10	34.40	1	28.0	1.0	4.4	45.4
SMF30A	SMF30CA	CK	JK	33.30	36.80	1	30.0	1.0	4.1	48.4
SMF33A	SMF33CA	CM	JM	36.70	40.60	1	33.0	1.0	3.8	53.3
SMF36A	SMF36CA	CP	JP	40.00	44.20	1	36.0	1.0	3.4	58.1
SMF40A	SMF40CA	CR	JR	44.40	49.10	1	40.0	1.0	3.1	64.5
SMF43A	SMF43CA	CT	JT	47.80	52.80	1	43.0	1.0	2.9	69.4
SMF45A	SMF45CA	CV	JV	50.00	55.30	1	45.0	1.0	2.8	72.7
SMF48A	SMF48CA	CX	JX	53.30	58.90	1	48.0	1.0	2.6	77.4

TVS

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMF51A	SMF51CA	CZ	JZ	56.7	62.7	1	51	1.0	2.4	82.4
SMF54A	SMF54CA	DE	KE	60.0	66.3	1	54	1.0	2.3	87.1
SMF58A	SMF58CA	RG	KG	64.4	71.2	1	58	1.0	2.1	93.6
SMF60A	SMF60CA	RK	KK	66.7	73.7	1	60	1.0	2.1	96.8
SMF64A	SMF64CA	RM	KM	71.1	78.6	1	64	1.0	1.9	103.0
SMF70A	SMF70CA	RP	KP	77.8	86.0	1	70	1.0	1.7	113.0
SMF75A	SMF75CA	RR	KR	83.3	92.1	1	75	1.0	1.6	121.0
SMF78A	SMF78CA	RT	KT	86.7	95.8	1	78	1.0	1.6	126.0
SMF85A	SMF85CA	RV	KV	94.4	104.0	1	85	1.0	1.5	137.0
SMF90A	-	RW	-	100.0	111.0	1	90	1.0	1.2	146.0
SMF100A	-	RX	-	111.0	123.0	1	100	1.0	1.1	162.0
SMF110A	-	SE	-	122.0	135.0	1	110	1.0	1.1	177.0
SMF120A	-	SG	-	133.0	147.0	1	120	1.0	1.0	193.0
SMF130A	-	SK	-	144.0	159.0	1	130	1.0	1.0	209.0
SMF150A	-	SM	-	167.0	185.0	1	150	1.0	0.8	243.0
SMF160A	-	SP	-	178.0	197.0	1	160	1.0	0.8	259.0
SMF170A	-	SR	-	189.0	209.0	1	170	1.0	0.7	275.0
SMF180A	-	ST	-	201.0	222.0	1	180	1.0	0.7	292.0
SMF188A	-	SV	-	209.0	231.0	1	188	1.0	0.7	304.0
SMF200A	-	SX	-	224.0	247.0	1	200	1.0	0.6	324.0
SMF220A	-	SZ	-	246.0	272.0	1	220	1.0	0.6	356.0
SMF250A	-	TE	-	279.0	309.0	1	250	1.0	0.5	405.0

Notes:
1. V_{BR} measured after I_T applied for 300 μS, I_T = square wave pulse or equivalent.
2. Surge current waveform per 10/1000 μS exponential wave.
3. All terms and symbols are consistent with ANSI/IEEE C62.35.
4. For bidirectional type having V_R of 10 volts and less, the I_R limit is double.

TVS

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Electrical Characteristics (T_A=25 °C unless otherwise noted)Table 1

Model		Device Marking Code		Breakdown Voltage V_{BR}@I_T		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_{WM}	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage V_C@I_{PPM}
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P4SMF5.0A	-	KE	-	6.40	7.00	10	5.0	400	43.5	9.2
P4SMF6.0A	-	KG	-	6.67	7.37	10	6.0	400	38.8	10.3
P4SMF6.5A	-	KK	-	7.22	7.98	10	6.5	250	35.7	11.2
P4SMF7.0A	-	KM	-	7.78	8.60	10	7.0	100	33.3	12.0
P4SMF7.5A	-	KP	-	8.33	9.21	1	7.5	50	31.0	12.9
P4SMF8.0A	-	KR	-	8.89	9.83	1	8.0	25	29.4	13.6
P4SMF8.5A	-	KT	-	9.44	10.40	1	8.5	10	27.8	14.4
P4SMF9.0A	P4SMF9.0CA	KV	AV	10.00	11.10	1	9.0	2.5	26.0	15.4
P4SMF10A	P4SMF10CA	KX	AX	11.10	12.30	1	10	2.5	23.5	17.0
P4SMF11A	P4SMF11CA	KZ	AZ	12.20	13.50	1	11	2.5	22.0	18.2
P4SMF12A	P4SMF12CA	LE	BE	13.30	14.70	1	12	2.5	20.1	19.9
P4SMF13A	P4SMF13CA	LG	BG	14.40	15.90	1	13	1.0	18.6	21.5
P4SMF14A	P4SMF14CA	LK	BK	15.60	17.20	1	14	1.0	17.2	23.2
P4SMF15A	P4SMF15CA	LM	BM	16.70	18.50	1	15	1.0	16.4	24.4
P4SMF16A	P4SMF16CA	LP	BP	17.80	19.70	1	16	1.0	15.4	26.0
P4SMF17A	P4SMF17CA	LR	BR	18.90	20.90	1	17	1.0	14.5	27.6
P4SMF18A	P4SMF18CA	LT	BT	20.00	22.10	1	18	1.0	13.7	29.2
P4SMF20A	P4SMF20CA	LV	BV	22.20	24.50	1	20	1.0	12.3	32.4
P4SMF22A	P4SMF22CA	LX	BX	24.40	26.90	1	22	1.0	11.3	35.5
P4SMF24A	P4SMF24CA	LZ	BZ	26.70	29.50	1	24	1.0	10.3	38.9
P4SMF26A	P4SMF26CA	ME	CE	28.90	31.90	1	26	1.0	9.5	42.1
P4SMF28A	P4SMF28CA	MG	CG	31.10	34.40	1	28	1.0	8.8	45.4
P4SMF30A	P4SMF30CA	MK	CK	33.30	36.80	1	30	1.0	8.3	48.4
P4SMF33A	P4SMF33CA	MM	CM	36.70	40.60	1	33	1.0	7.5	53.3
P4SMF36A	P4SMF36CA	MP	CP	40.00	44.20	1	36	1.0	6.9	58.1

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Part Number		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P4SMF40A	P4SMF40CA	MR	CR	44.40	49.10	1	40	1.0	6.2	64.5
P4SMF43A	P4SMF43CA	MT	CT	47.80	52.80	1	43	1.0	5.8	69.4
P4SMF45A	P4SMF45CA	MV	CV	50.00	55.30	1	45	1.0	5.5	72.7
P4SMF48A	P4SMF48CA	MX	CX	53.30	58.90	1	48	1.0	5.2	77.4
P4SMF51A	P4SMF51CA	MZ	CZ	56.70	62.70	1	51	1.0	4.9	82.4
P4SMF54A	-	NE	-	60	66.3	1	54	1.0	4.6	87.1
P4SMF58A	-	NG	-	64.4	71.2	1	58	1.0	4.3	93.6
P4SMF60A	-	NK	-	66.7	73.7	1	60	1.0	4.1	96.8
P4SMF64A	-	NM	-	71.1	78.6	1	64	1.0	2.9	103.0
P4SMF70A	-	NP	-	77.8	86	1	70	1.0	3.5	113.0
P4SMF75A	-	NR	-	83.3	92.1	1	75	1.0	3.3	121.0
P4SMF78A	-	NT	-	86.7	95.8	1	78	1.0	3.2	126.0
P4SMF85A	-	NV	-	94.4	104	1	85	1.0	2.9	137.0

Notes:
1. V_{BR} measured after IT applied for 300 μS, I_T = square wave pulse or equivalent.
2. Surge current waveform per 10/1000 μS exponential wave and derated per Fig.2.
3. All terms and symbols are consistent with ANSI/IEEE C62.35.
4. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.

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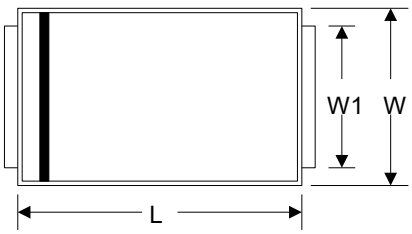
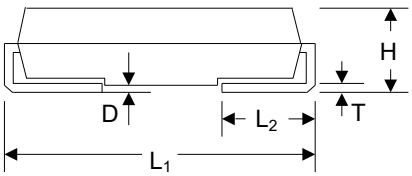
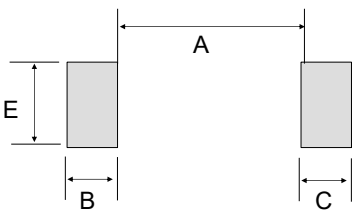
Package Outline Dimensions (DO-214AC)







(Mounting Pad Layout)

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	3.99	4.60	0.157	0.181
W	2.30	2.79	0.095	0.110
W_1	1.25	1.65	0.049	0.065
H	1.90	2.44	0.075	0.096
T	0.152	0.305	0.006	0.012
L_1	4.80	5.28	0.189	0.208
L_2	0.78	1.52	0.030	0.060
D	-	0.20	-	0.008
A	-	2.30	-	0.090
B	2.10	-	0.082	-
C	2.10	-	0.082	-
E	1.80	-	0.070	-

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMAJ5.0A	SMAJ5.0CA	AE	WE	6.40	7.00	10	5.0	800	43.5	9.2
SMAJ6.0A	SMAJ6.0CA	AG	WG	6.67	7.37	10	6.0	800	38.8	10.3
SMAJ6.5A	SMAJ6.5CA	AK	WK	7.22	7.98	10	6.5	500	35.7	11.2
SMAJ7.0A	SMAJ7.0CA	AM	WM	7.78	8.60	10	7.0	200	33.3	12.0
SMAJ7.5A	SMAJ7.5CA	AP	WP	8.33	9.21	1	7.5	100	31.0	12.9
SMAJ8.0A	SMAJ8.0CA	AR	WR	8.89	9.83	1	8.0	50	29.4	13.6
SMAJ8.5A	SMAJ8.5CA	AT	WT	9.44	10.40	1	8.5	20	27.8	14.4
SMAJ9.0A	SMAJ9.0CA	AV	WV	10.00	11.10	1	9.0	10	26.0	15.4
SMAJ10A	SMAJ10CA	AX	WX	11.10	12.30	1	10.0	5	23.5	17.0
SMAJ11A	SMAJ11CA	AZ	WZ	12.20	13.50	1	11.0	1	22.0	18.2
SMAJ12A	SMAJ12CA	BE	XE	13.30	14.70	1	12.0	1	20.1	19.9
SMAJ13A	SMAJ13CA	BG	XG	14.40	15.90	1	13.0	1	18.6	21.5
SMAJ14A	SMAJ14CA	BK	XK	15.60	17.20	1	14.0	1	17.2	23.2
SMAJ15A	SMAJ15CA	BM	XM	16.70	18.50	1	15.0	1	16.4	24.4
SMAJ16A	SMAJ16CA	BP	XP	17.80	19.70	1	16.0	1	15.4	26.0
SMAJ17A	SMAJ17CA	BR	XR	18.90	20.90	1	17.0	1	14.5	27.6
SMAJ18A	SMAJ18CA	BT	XT	20.00	22.10	1	18.0	1	13.7	29.2
SMAJ20A	SMAJ20CA	BV	XV	22.20	24.50	1	20.0	1	12.3	32.4
SMAJ22A	SMAJ22CA	BX	XX	24.40	26.90	1	22.0	1	11.3	35.5
SMAJ24A	SMAJ24CA	BZ	XZ	26.70	29.50	1	24.0	1	10.3	38.9
SMAJ26A	SMAJ26CA	CE	YE	28.90	31.90	1	26.0	1	9.5	42.1
SMAJ28A	SMAJ28CA	CG	YG	31.10	34.40	1	28.0	1	8.8	45.4
SMAJ30A	SMAJ30CA	CK	YK	33.30	36.80	1	30.0	1	8.3	48.4
SMAJ33A	SMAJ33CA	CM	YM	36.70	40.60	1	33.0	1	7.5	53.3
SMAJ36A	SMAJ36CA	CP	YP	40.00	44.20	1	36.0	1	6.9	58.1
SMAJ40A	SMAJ40CA	CR	YR	44.40	49.10	1	40.0	1	6.2	64.5
SMAJ43A	SMAJ43CA	CT	YT	47.80	52.80	1	43.0	1	5.8	69.4
SMAJ45A	SMAJ45CA	CV	YV	50.00	55.30	1	45.0	1	5.5	72.7
SMAJ48A	SMAJ48CA	CX	YX	53.30	58.90	1	48.0	1	5.2	77.4
SMAJ51A	SMAJ51CA	CZ	YZ	56.70	62.70	1	51.0	1	4.9	82.4

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMAJ54A	SMAJ54CA	RE	ZE	60.0	66.3	1	54	1	4.6	87.1
SMAJ58A	SMAJ58CA	RG	ZG	64.4	71.2	1	58	1	4.3	93.6
SMAJ60A	SMAJ60CA	RK	ZK	66.7	73.7	1	60	1	4.1	96.8
SMAJ64A	SMAJ64CA	RM	ZM	71.1	78.6	1	64	1	3.9	103.0
SMAJ70A	SMAJ70CA	RP	ZP	77.8	86.0	1	70	1	3.5	113.0
SMAJ75A	SMAJ75CA	RR	ZR	83.3	92.1	1	75	1	3.3	121.0
SMAJ78A	SMAJ78CA	RT	ZT	86.7	95.8	1	78	1	3.2	126.0
SMAJ85A	SMAJ85CA	RV	ZV	94.4	104.0	1	85	1	2.9	137.0
SMAJ90A	SMAJ90CA	RX	ZX	100.0	111.0	1	90	1	2.7	146.0
SMAJ100A	SMAJ100CA	RZ	ZZ	111.0	123.0	1	100	1	2.5	162.0
SMAJ110A	SMAJ110CA	SE	VE	122.0	135.0	1	110	1	2.3	177.0
SMAJ120A	SMAJ120CA	SG	VG	133.0	147.0	1	120	1	2.1	193.0
SMAJ130A	SMAJ130CA	SK	VK	144.0	159.0	1	130	1	1.9	209.0
SMAJ150A	SMAJ150CA	SM	VM	167.0	185.0	1	150	1	1.6	243.0
SMAJ160A	SMAJ160CA	SP	VP	178.0	197.0	1	160	1	1.5	259.0
SMAJ170A	SMAJ170CA	SR	VR	189.0	209.0	1	170	1	1.5	275.0
SMAJ180A	SMAJ180CA	ST	VT	201.0	222.0	1	180	1	1.4	292.0
SMAJ188A	SMAJ188CA	SB	VB	209.0	231.0	1	188	1	1.4	304.0
SMAJ200A	SMAJ200CA	SV	VV	224.0	247.0	1	200	1	1.2	324.0
SMAJ220A	-	SX	-	246.0	272.0	1	220	1	1.1	356.0
-	SMAJ220CA*	-	VX	246.0	272.0	1	220	1	1.1	356.0
SMAJ250A	-	SZ	-	279.0	309.0	1	250	1	1.0	405.0
-	SMAJ250CA*	-	VZ	279.0	309.0	1	250	1	1.0	405.0
SMAJ300A*	SMAJ300CA*	TE	UE	335.0	371.0	1	300	1	0.8	486.0
SMAJ350A*	SMAJ350CA*	TG	UG	391.0	432.0	1	350	1	0.7	567.0
SMAJ400A*	SMAJ400CA*	TK	UK	447.0	494.0	1	400	1	0.6	648.0
SMAJ440A*	SMAJ440CA*	TM	UM	492.0	543.0	1	440	1	0.6	713.0

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN, the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A.The parts without A are currently available, but not recommended for new designs. The parts with A are preferred.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P4SMA6.8A	P4SMA6.8CA	6V8A	6V8C	6.45	7.14	10	5.80	1000	39.0	10.5
P4SMA7.5A	P4SMA7.5CA	7V5A	7V5C	7.13	7.88	10	6.40	500	36.3	11.3
P4SMA8.2A	P4SMA8.2CA	8V2A	8V2C	7.79	8.61	10	7.02	200	33.9	12.1
P4SMA9.1A	P4SMA9.1CA	9V1A	9V1C	8.65	9.55	1	7.78	50	30.6	13.4
P4SMA10A	P4SMA10CA	10A	10C	9.50	10.50	1	8.55	10	28.3	14.5
P4SMA11A	P4SMA11CA	11A	11C	10.50	11.60	1	9.40	5	26.3	15.6
P4SMA12A	P4SMA12CA	12A	12C	11.40	12.60	1	10.20	5	24.6	16.7
P4SMA13A	P4SMA13CA	13A	13C	12.40	13.70	1	11.10	1	22.5	18.2
P4SMA15A	P4SMA15CA	15A	15C	14.30	15.80	1	12.80	1	19.3	21.2
P4SMA16A	P4SMA16CA	16A	16C	15.20	16.80	1	13.60	1	18.2	22.5
P4SMA18A	P4SMA18CA	18A	18C	17.10	18.90	1	15.30	1	16.1	25.5
P4SMA20A	P4SMA20CA	20A	20C	19.00	21.00	1	17.10	1	14.8	27.7
P4SMA22A	P4SMA22CA	22A	22C	20.90	23.10	1	18.80	1	13.4	30.6
P4SMA24A	P4SMA24CA	24A	24C	22.80	25.20	1	20.50	1	12.3	33.2
P4SMA27A	P4SMA27CA	27A	27C	25.70	28.40	1	23.10	1	10.9	37.5
P4SMA30A	P4SMA30CA	30A	30C	28.50	31.50	1	25.60	1	9.9	41.4
P4SMA33A	P4SMA33CA	33A	33C	31.40	34.70	1	28.20	1	9.0	45.7
P4SMA36A	P4SMA36CA	36A	36C	34.20	37.80	1	30.80	1	8.2	49.9
P4SMA39A	P4SMA39CA	39A	39C	37.10	41.00	1	33.30	1	7.6	53.9
P4SMA43A	P4SMA43CA	43A	43C	40.90	45.20	1	36.80	1	6.9	59.3
P4SMA47A	P4SMA47CA	47A	47C	44.70	49.40	1	40.20	1	6.3	64.8
P4SMA51A	P4SMA51CA	51A	51C	48.50	53.60	1	43.60	1	5.8	70.1
P4SMA56A	P4SMA56CA	56A	56C	53.20	58.80	1	47.80	1	5.3	77.0
P4SMA62A	P4SMA62CA	62A	62C	58.90	65.10	1	53.00	1	4.8	85.0

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P4SMA68A	P4SMA68CA	68A	68C	64.6	71.4	1	58.1	1	4.5	92
P4SMA75A	P4SMA75CA	75A	75C	71.3	78.8	1	64.1	1	4.0	103
P4SMA82A	P4SMA82CA	82A	82C	77.9	86.1	1	70.1	1	3.6	113
P4SMA91A	P4SMA91CA	91A	91C	86.5	95.5	1	77.8	1	3.3	125
P4SMA100A	P4SMA100CA	100A	100C	95.0	105.0	1	85.5	1	3.0	137
P4SMA110A	P4SMA110CA	110A	110C	105.0	116.0	1	94.0	1	2.7	152
P4SMA120A	P4SMA120CA	120A	120C	114.0	126.0	1	102.0	1	2.5	165
P4SMA130A	P4SMA130CA	130A	130C	124.0	137.0	1	111.0	1	2.3	179
P4SMA150A	P4SMA150CA	150A	150C	143.0	158.0	1	128.0	1	2.0	207
P4SMA160A	P4SMA160CA	160A	160C	152.0	168.0	1	136.0	1	1.9	219
P4SMA170A	P4SMA170CA	170A	170C	162.0	179.0	1	145.0	1	1.8	234
P4SMA180A	P4SMA180CA	180A	180C	171.0	189.0	1	154.0	1	1.7	246
P4SMA200A	P4SMA200CA	200A	200C	190.0	210.0	1	171.0	1	1.5	274
P4SMA220A	P4SMA220CA	220A	220C	209.0	231.0	1	185.0	1	1.3	328
P4SMA250A	-	250A	-	237.0	263.0	1	214.0	1	1.2	344
-	P4SMA250CA*	-	250C	237.0	263.0	1	214.0	1	1.2	344
P4SMA300A	-	300A	-	285.0	315.0	1	256.0	1	1	414
-	P4SMA300CA*	-	300C	285.0	315.0	1	256.0	1	1	414
P4SMA350A*	P4SMA350CA*	350A	350C	332.0	368.0	1	300.0	1	0.9	482
P4SMA400A*	P4SMA400CA*	400A	400C	380.0	420.0	1	342.0	1	0.8	548
P4SMA440A*	P4SMA440CA*	440A	440C	418.0	462.0	1	376.0	1	0.7	602
P4SMA480A*	P4SMA480CA*	480A	480C	456.0	504.0	1	408.0	1	0.61	658
P4SMA510A*	P4SMA510CA*	510A	510C	485.0	535.0	1	434.0	1	0.57	698
P4SMA530A*	P4SMA530CA*	530A	530C	503.5	556.5	1	451.0	1	0.55	725
P4SMA540A*	P4SMA540CA*	540A	540C	513.0	567.0	1	460.0	1	0.54	740
P4SMA550A*	P4SMA550CA*	550A	550C	522.5	577.5	1	468.0	1	0.53	760

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN , the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs .The parts with A are preferred.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.

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Electrical Characteristics (T_A=25 °C unless otherwise noted)Table 1

Model		Device Marking Code		Breakdown Voltage V_{BR}@I_T		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_R	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage V_C@I_{PPM}
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMA6J5.0A	SMA6J5.0CA	KE	AE	6.4	7	10	5	800	65.3	9.2
SMA6J6.0A	SMA6J6.0CA	KG	AG	6.67	7.37	10	6	800	58.3	10.3
SMA6J6.5A	SMA6J6.5CA	KK	AK	7.22	7.98	10	6.5	500	53.6	11.2
SMA6J7.0A	SMA6J7.0CA	KM	AM	7.78	8.6	10	7	200	50	12
SMA6J7.5A	SMA6J7.5CA	KP	AP	8.33	9.21	1	7.5	100	46.6	12.9
SMA6J8.0A	SMA6J8.0CA	KR	AR	8.89	9.83	1	8	50	44.2	13.6
SMA6J8.5A	SMA6J8.5CA	KT	AT	9.44	10.4	1	8.5	20	41.7	14.4
SMA6J9.0A	SMA6J9.0CA	KV	AV	10	11.1	1	9	10	39	15.4
SMA6J10A	SMA6J10CA	KX	AX	11.1	12.3	1	10	5	35.3	17
SMA6J11A	SMA6J11CA	KZ	AZ	12.2	13.5	1	11	1	33	18.2
SMA6J12A	SMA6J12CA	LE	BE	13.3	14.7	1	12	1	30.2	19.9
SMA6J13A	SMA6J13CA	LG	BG	14.4	15.9	1	13	1	28	21.5
SMA6J14A	SMA6J14CA	LK	BK	15.6	17.2	1	14	1	25.9	23.2
SMA6J15A	SMA6J15CA	LM	BM	16.7	18.5	1	15	1	24.6	24.4
SMA6J16A	SMA6J16CA	LP	BP	17.8	19.7	1	16	1	23.1	26
SMA6J17A	SMA6J17CA	LR	BR	18.9	20.9	1	17	1	21.8	27.6
SMA6J18A	SMA6J18CA	LT	BT	20	22.1	1	18	1	20.6	29.2
SMA6J20A	SMA6J20CA	LV	BV	22.2	24.5	1	20	1	18.6	32.4
SMA6J22A	SMA6J22CA	LX	BX	24.4	26.9	1	22	1	16.9	35.5
SMA6J24A	SMA6J24CA	LZ	BZ	26.7	29.5	1	24	1	15.5	38.9
SMA6J26A	SMA6J26CA	ME	CE	28.9	31.9	1	26	1	14.3	42.1
SMA6J28A	SMA6J28CA	MG	CG	31.1	34.4	1	28	1	13.3	45.4
SMA6J30A	SMA6J30CA	MK	CK	33.3	36.8	1	30	1	12.4	48.4
SMA6J33A	SMA6J33CA	MM	CM	36.7	40.6	1	33	1	11.3	53.3
SMA6J36A	SMA6J36CA	MP	CP	40	44.2	1	36	1	10.4	58.1
SMA6J40A	SMA6J40CA	MR	CR	44.4	49.1	1	40	1	9.3	64.5
SMA6J43A	SMA6J43CA	MT	CT	47.8	52.8	1	43	1	8.7	69.4
SMA6J45A	SMA6J45CA	MV	CV	50	55.3	1	45	1	8.3	72.7
SMA6J48A	SMA6J48CA	MX	CX	53.3	58.9	1	48	1	7.8	77.4
SMA6J51A	SMA6J51CA	MZ	CZ	56.7	62.7	1	51	1	7.3	82.4
SMA6J54A	SMA6J54CA	NE	DE	60	66.3	1	54	1	6.9	87.1

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMA6J58A	SMA6J58CA	NG	DG	64.4	71.2	1	58	1	6.5	93.6
SMA6J60A	SMA6J60CA	NK	DK	66.7	73.7	1	60	1	6.2	96.8
SMA6J64A	SMA6J64CA	NM	DM	71.1	78.6	1	64	1	5.9	103
SMA6J70A	SMA6J70CA	NP	DP	77.8	86	1	70	1	5.3	113
SMA6J75A	SMA6J75CA	NR	DR	83.3	92.1	1	75	1	5	121
SMA6J78A	SMA6J78CA	NT	DT	86.7	95.8	1	78	1	4.8	126
SMA6J85A	SMA6J85CA	NV	DV	94.4	104	1	85	1	4.4	137
SMA6J90A	SMA6J90CA	NX	DX	100	111	1	90	1	4.1	146
SMA6J100A	SMA6J100CA	NZ	DZ	111	123	1	100	1	3.7	162
SMA6J110A	SMA6J110CA	PE	EE	122	135	1	110	1	3.4	177
SMA6J120A	SMA6J120CA	PG	EG	133	147	1	120	1	3.1	193
SMA6J130A	SMA6J130CA	PK	EK	144	159	1	130	1	2.9	209
SMA6J150A	SMA6J150CA	PM	EM	167	185	1	150	1	2.5	243
SMA6J160A	SMA6J160CA	PP	EP	178	197	1	160	1	2.3	259
SMA6J170A	SMA6J170CA	PR	ER	189	209	1	170	1	2.2	275
SMA6J180A	SMA6J180CA	PT	ET	201	222	1	180	1	2.1	292
SMA6J188A	SMA6J188CA	PB	EB	209	231	1	188	1	2	304
SMA6J200A	SMA6J200CA	PV	EV	224	247	1	200	1	1.9	324
SMA6J220A	SMA6J220CA	PX	EX	246	272	1	220	1	1.7	356
SMA6J250A	SMA6J250CA	PZ	EZ	279	309	1	250	1	1.5	405

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN , the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs .The parts with A are preferred.
3. V_F < 3.5 V for single die parts.

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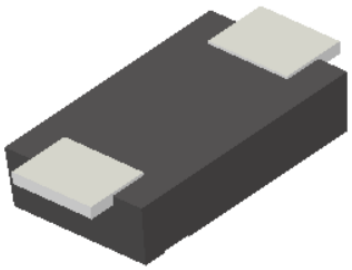
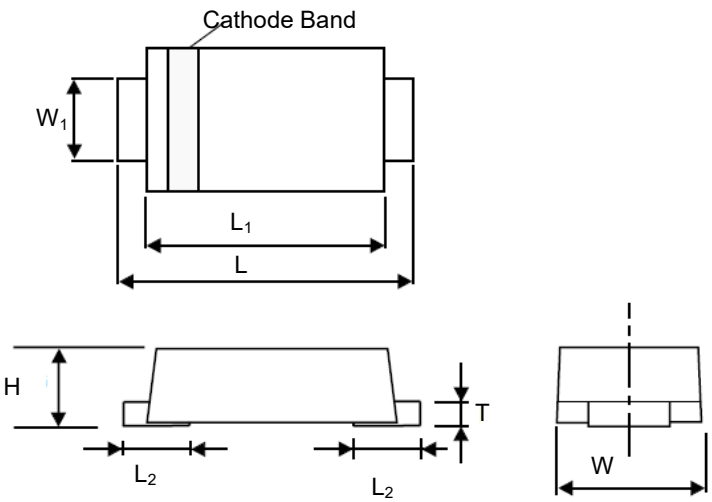
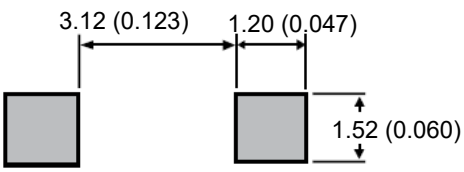


Package Outline Dimensions (DO - 221AC)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L_1	3.95	4.60	0.156	0.181
L	4.80	5.60	0.189	0.220
W_1	1.25	1.75	0.049	0.069
W	2.25	2.95	0.088	0.116
L_2	0.75	1.50	0.030	0.059
T	0.125	0.250	0.005	0.010
H	0.90	1.10	0.035	0.043



Mounting Pad Layout

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Electrical Characteristics (T_A = 25 °C unless otherwise noted)

Model	Device Marking Code	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Uni	(V)		(mA)	(V)	(μA)	(A)	(V)
SMA6L5.0A	AE	6.40	7.00	10	5.0	800	65.3	9.2
SMA6L6.0A	AG	6.67	7.37	10	6.0	800	58.3	10.3
SMA6L6.5A	AK	7.22	7.98	10	6.5	500	53.6	11.2
SMA6L7.0A	AM	7.78	8.60	10	7.0	200	50.0	12.0
SMA6L7.5A	AP	8.33	9.21	1	7.5	100	46.6	12.9
SMA6L8.0A	AR	8.89	9.83	1	8.0	50	44.2	13.6
SMA6L8.5A	AT	9.44	10.40	1	8.5	20	41.7	14.4
SMA6L9.0A	AV	10.00	11.10	1	9.0	10	39.0	15.4
SMA6L10A	AX	11.10	12.30	1	10.0	5	35.3	17.0
SMA6L11A	AZ	12.20	13.50	1	11.0	1	33.0	18.2
SMA6L12A	BE	13.30	14.70	1	12.0	1	30.2	19.9
SMA6L13A	BG	14.40	15.90	1	13.0	1	28.0	21.5
SMA6L14A	BK	15.60	17.20	1	14.0	1	25.9	23.2
SMA6L15A	BM	16.70	18.50	1	15.0	1	24.6	24.4
SMA6L16A	BP	17.80	19.70	1	16.0	1	23.1	26.0
SMA6L17A	BR	18.90	20.90	1	17.0	1	21.8	27.6
SMA6L18A	BT	20.00	22.10	1	18.0	1	20.6	29.2
SMA6L20A	BV	22.20	24.50	1	20.0	1	18.6	32.4
SMA6L22A	BX	24.40	26.90	1	22.0	1	16.9	35.5
SMA6L24A	BZ	26.70	29.50	1	24.0	1	15.5	38.9
SMA6L26A	CE	28.90	31.90	1	26.0	1	14.3	42.1
SMA6L28A	CG	31.10	34.40	1	28.0	1	13.3	45.4
SMA6L30A	CK	33.30	36.80	1	30.0	1	12.4	48.4
SMA6L33A	CM	36.70	40.60	1	33.0	1	11.3	53.3
SMA6L36A	CP	40.00	44.20	1	36.0	1	10.4	58.1
SMA6L40A	CR	44.40	49.10	1	40.0	1	9.3	64.5
SMA6L43A	CT	47.80	52.80	1	43.0	1	8.7	69.4
SMA6L45A	CV	50.00	55.30	1	45.0	1	8.3	72.7
SMA6L48A	CX	53.30	58.90	1	48.0	1	7.8	77.4
SMA6L51A	CZ	56.70	62.70	1	51.0	1	7.3	82.4
SMA6L54A	RE	60.00	66.30	1	54.0	1	6.9	87.1
SMA6L58A	RG	64.40	71.20	1	58.0	1	6.5	93.6

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Model	Device Marking Code	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Uni	(V)		(mA)	(V)	(μA)	(A)	(V)
SMA6L60A	RK	66.70	73.70	1	60.0	1	6.20	96.8
SMA6L64A	RM	71.1	78.60	1	64.0	1	5.90	103.0
SMA6L70A	RP	77.80	86.00	1	70.0	1	5.30	113.0
SMA6L75A	RR	83.30	92.10	1	75.0	1	5.00	121.0
SMA6L78A	RT	86.70	95.80	1	78.0	1	4.80	126.0
SMA6L85A	RV	94.40	104.00	1	85.0	1	4.40	137.0
SMA6L90A	RX	100.0	111.00	1	90.0	1	4.20	146.0
SMA6L100A	RZ	111.0	123.00	1	100.0	1	3.70	162.0
SMA6L 110A	SE	122.0	135.00	1	110.0	1	3.40	177.0
SMA6L120A	SG	133.0	147.00	1	120.0	1	3.20	193.0
SMA6L 130A	SK	144.0	159.00	1	130.0	1	2.90	209.0
SMA6L150A	SM	167.0	185.00	1	150.0	1	1.650	243.0
SMA6L160A	SP	178.0	197.00	1	160.0	1	1.550	259.0
SMA6L170A	SR	189.0	209.00	1	170.0	1	1.500	275.0
SMA6L180A	ST	201.0	222.00	1	180.0	1	1.400	292.0
SMA6L185A	SU	209.0	231.00	1	185.0	1	1.400	303.0
SMA6L200A	SV	224.0	247.00	1	200.0	1	1.250	324.0
SMA6L215A	SW	237.0	263.00	1	215.0	1	1.170	344.0
SMA6L220A	SX	246.0	272.00	1	220.0	1	1.130	356.0
SMA6L250A	SZ	279.0	309.00	1	250.0	1	0.950	405.0

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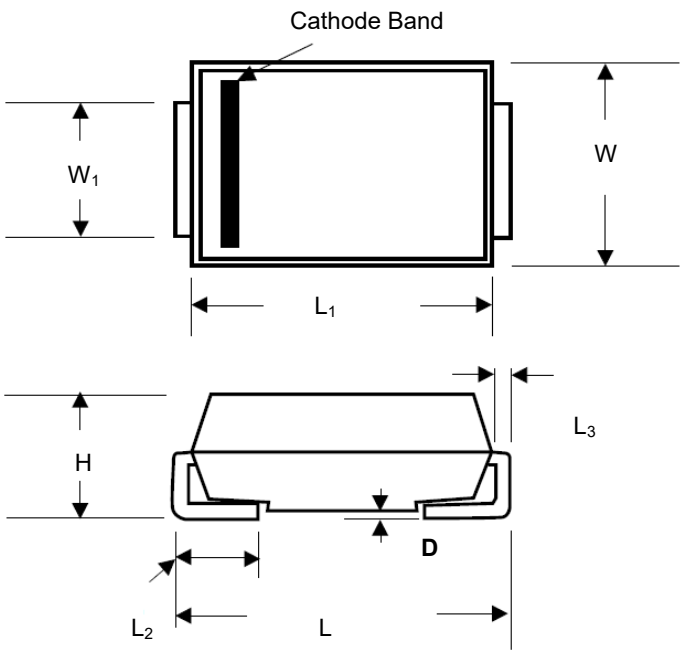
Package Outline Dimensions (DO-214AA)



DO - 214AA (SMB J-Bend)

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
W_1	1.95	2.20	0.077	0.086
L_1	4.06	4.57	0.160	0.180
W	3.30	3.94	0.130	0.155
H	2.13	2.44	0.084	0.096
L_2	0.76	1.52	0.030	0.060
D	-	0.20	-	0.008
L	5.21	5.59	0.205	0.220
L_3	0.15	0.30	0.006	0.012

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model	Device Marking Code	Min. Breakdown Voltage at I_T=1mA V_{BR}	Reverse Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_R	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage at V_C@I_{PPM}=5.0 A	Max. Junction Capacitance @0 Volts	Working Inverse Blocking Voltage V_{WIB}	Inverse Blocking Leakage Current at I_{IB} @ V_{WIB}	Peak Inverse Blocking Voltage V_{PIB}
Uni	Uni	(V)	(V)	(μA)	(A)	(V	(pF)	(V)	(mA)	(V)
SACB5.0	SKE	7.60	5.0	300	44.0	10.0	45	75	1.0	100
SACB6.0	SKG	7.90	6.0	300	41.0	11.2	45	75	1.0	100
SACB7.0	SKM	8.33	7.0	300	38.0	12.6	45	75	1.0	100
SACB8.0	SKR	8.89	8.0	100	36.0	13.4	45	75	1.0	100
SACB8.5	SKT	9.44	8.5	50	34.0	14.0	45	75	1.0	100
SACB10	SKX	11.10	10.0	5	29.0	16.3	45	75	1.0	100
SACB12	SLE	13.30	12.0	5	25.0	19.0	45	75	1.0	100
SACB15	SLM	16.70	15.0	5	20.0	23.6	45	75	1.0	100
SACB18	SLT	20.00	18.0	5	15.0	28.8	45	75	1.0	100
SACB22	SLX	24.40	22.0	5	14.0	35.4	45	75	1.0	100
SACB26	SME	28.90	26.0	5	11.1	42.3	45	75	1.0	100
SACB30	SMK	33.30	30.0	5	10.0	48.6	45	75	1.0	100
SACB36	SMP	40.00	36.0	5	8.6	60.0	45	75	1.0	100
SACB45	SMV	50.00	45.0	5	6.8	77.0	45	150	1.0	200
SACB50	SMZ	55.50	50.0	5	5.8	88.0	45	150	1.0	200

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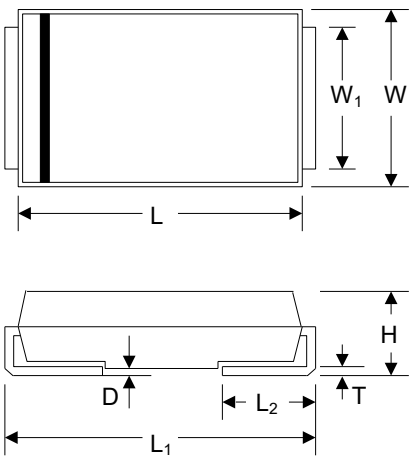
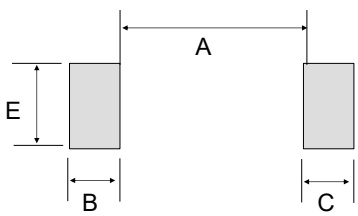
Package Outline Dimensions (DO-214AA)





(Mounting Pad Layout)

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	4.06	4.75	0.160	0.187
W	3.30	3.94	0.130	0.155
W_1	1.93	2.20	0.076	0.086
H	1.99	2.61	0.078	0.103
T	0.152	0.305	0.006	0.012
L_1	5.21	5.59	0.205	0.220
L_2	0.76	1.52	0.030	0.060
D	-	0.20	-	0.008
A	-	2.74	-	0.107
B	2.16	-	0.085	-
C	2.16	-	0.085	-
E	2.26	-	0.089	-

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMBJ5.0A	SMBJ5.0CA	KE	AE	6.40	7.00	10	5.0	800	65.3	9.2
SMBJ6.0A	SMBJ6.0CA	KG	AG	6.67	7.37	10	6.0	800	58.3	10.3
SMBJ6.5A	SMBJ6.5CA	KK	AK	7.22	7.98	10	6.5	500	53.6	11.2
SMBJ7.0A	SMBJ7.0CA	KM	AM	7.78	8.60	10	7.0	200	50.0	12.0
SMBJ7.5A	SMBJ7.5CA	KP	AP	8.33	9.21	1	7.5	100	46.6	12.9
SMBJ8.0A	SMBJ8.0CA	KR	AR	8.89	9.83	1	8.0	50	44.2	13.6
SMBJ8.5A	SMBJ8.5CA	KT	AT	9.44	10.40	1	8.5	20	41.7	14.4
SMBJ9.0A	SMBJ9.0CA	KV	AV	10.00	11.10	1	9.0	10	39.0	15.4
SMBJ10A	SMBJ10CA	KX	AX	11.10	12.30	1	10.0	5	35.3	17.0
SMBJ11A	SMBJ11CA	KZ	AZ	12.20	13.50	1	11.0	1	33.0	18.2
SMBJ12A	SMBJ12CA	LE	BE	13.30	14.70	1	12.0	1	30.2	19.9
SMBJ13A	SMBJ13CA	LG	BG	14.40	15.90	1	13.0	1	28.0	21.5
SMBJ14A	SMBJ14CA	LK	BK	15.60	17.20	1	14.0	1	25.9	23.2
SMBJ15A	SMBJ15CA	LM	BM	16.70	18.50	1	15.0	1	24.6	24.4
SMBJ16A	SMBJ16CA	LP	BP	17.80	19.70	1	16.0	1	23.1	26.0
SMBJ17A	SMBJ17CA	LR	BR	18.90	20.90	1	17.0	1	21.8	27.6
SMBJ18A	SMBJ18CA	LT	BT	20.00	22.10	1	18.0	1	20.6	29.2
SMBJ20A	SMBJ20CA	LV	BV	22.20	24.50	1	20.0	1	18.6	32.4
SMBJ22A	SMBJ22CA	LX	BX	24.40	26.90	1	22.0	1	16.9	35.5
SMBJ24A	SMBJ24CA	LZ	BZ	26.70	29.50	1	24.0	1	15.5	38.9
SMBJ26A	SMBJ26CA	ME	CE	28.90	31.90	1	26.0	1	14.3	42.1
SMBJ28A	SMBJ28CA	MG	CG	31.10	34.40	1	28.0	1	13.3	45.4
SMBJ30A	SMBJ30CA	MK	CK	33.30	36.80	1	30.0	1	12.4	48.4
SMBJ33A	SMBJ33CA	MM	CM	36.70	40.60	1	33.0	1	11.3	53.3
SMBJ36A	SMBJ36CA	MP	CP	40.00	44.20	1	36.0	1	10.4	58.1

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMBJ40A	SMBJ40CA	MR	CR	44.4	49.1	1	40	1	9.3	64.5
SMBJ43A	SMBJ43CA	MT	CT	47.8	52.8	1	43	1	8.7	69.4
SMBJ45A	SMBJ45CA	MV	CV	50.0	55.3	1	45	1	8.3	72.7
SMBJ48A	SMBJ48CA	MX	CX	53.3	58.9	1	48	1	7.8	77.4
SMBJ51A	SMBJ51CA	MZ	CZ	56.7	62.7	1	51	1	7.3	82.4
SMBJ54A	SMBJ54CA	NE	DE	60.0	66.3	1	54	1	6.9	87.1
SMBJ58A	SMBJ58CA	NG	DG	64.4	71.2	1	58	1	6.5	93.6
SMBJ60A	SMBJ60CA	NK	DK	66.7	73.7	1	60	1	6.2	96.8
SMBJ64A	SMBJ64CA	NM	DM	71.1	78.6	1	64	1	5.9	103.0
SMBJ70A	SMBJ70CA	NP	DP	77.8	86.0	1	70	1	5.3	113.0
SMBJ75A	SMBJ75CA	NR	DR	83.3	92.1	1	75	1	5.0	121.0
SMBJ78A	SMBJ78CA	NT	DT	86.7	95.8	1	78	1	4.8	126.0
SMBJ85A	SMBJ85CA	NV	DV	94.4	104.0	1	85	1	4.4	137.0
SMBJ90A	SMBJ90CA	NX	DX	100.0	111.0	1	90	1	4.1	146.0
SMBJ100A	SMBJ100CA	NZ	DZ	111.0	123.0	1	100	1	3.7	162.0
SMBJ110A	SMBJ110CA	PE	EE	122.0	135.0	1	110	1	3.4	177.0
SMBJ120A	SMBJ120CA	PG	EG	133.0	147.0	1	120	1	3.1	193.0
SMBJ130A	SMBJ130CA	PK	EK	144.0	159.0	1	130	1	2.9	209.0
SMBJ150A	SMBJ150CA	PM	EM	167.0	185.0	1	150	1	2.5	243.0
SMBJ160A	SMBJ160CA	PP	EP	178.0	197.0	1	160	1	2.3	259.0
SMBJ170A	SMBJ170CA	PR	ER	189.0	209.0	1	170	1	2.2	275.0
SMBJ180A	SMBJ180CA	PT	ET	201.0	222.0	1	180	1	2.1	292.0
SMBJ188A	SMBJ188CA	PB	EB	209.0	231.0	1	188	1	2.0	304.0
SMBJ200A	SMBJ200CA	PV	EV	224.0	247.0	1	200	1	1.9	324.0
SMBJ220A	SMBJ220CA	PX	EX	246.0	272.0	1	220	1	1.7	356.0
SMBJ250A	SMBJ250CA	PZ	EZ	279.0	309.0	1	250	1	1.5	405.0
SMBJ300A*	SMBJ300CA*	QE	FE	335.0	371.0	1	300	1	1.7	486.0
SMBJ350A*	SMBJ350CA*	QG	FG	391.0	432.0	1	350	1	1.5	567.0
SMBJ400A*	SMBJ400CA*	QK	FK	447.0	494.0	1	400	1	1.3	648.0
SMBJ440A*	SMBJ440CA*	QM	FM	492.0	543.0	1	440	1	1.1	713.0

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN , the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs .The parts with A are preferred.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.

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Electrical Characteristics (T_A=25 °C unless otherwise noted)Table 1

Model		Device Marking Code		Breakdown Voltage V_{BR}@I_T		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_R	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage V_C@I_{PPM}
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P6SMB6.8A	P6SMB6.8CA	6V8A	6V8C	6.45	7.14	10	5.80	1000	58.1	10.5
P6SMB7.5A	P6SMB7.5CA	7V5A	7V5C	7.13	7.88	10	6.40	500	54.0	11.3
P6SMB8.2A	P6SMB8.2CA	8V2A	8V2C	7.79	8.61	10	7.02	200	50.4	12.1
P6SMB9.1A	P6SMB9.1CA	9V1A	9V1C	8.65	9.55	1	7.78	50	45.5	13.4
P6SMB10A	P6SMB10CA	10A	10C	9.50	10.50	1	8.55	10	42.1	14.5
P6SMB11A	P6SMB11CA	11A	11C	10.50	11.60	1	9.40	5	39.1	15.6
P6SMB12A	P6SMB12CA	12A	12C	11.40	12.60	1	10.20	5	36.5	16.7
P6SMB13A	P6SMB13CA	13A	13C	12.40	13.70	1	11.10	1	33.5	18.2
P6SMB15A	P6SMB15CA	15A	15C	14.30	15.80	1	12.80	1	28.8	21.2
P6SMB16A	P6SMB16CA	16A	16C	15.20	16.80	1	13.60	1	27.1	22.5
P6SMB18A	P6SMB18CA	18A	18C	17.10	18.90	1	15.30	1	24.2	25.5
P6SMB20A	P6SMB20CA	20A	20C	19.00	21.00	1	17.10	1	22.0	27.7
P6SMB22A	P6SMB22CA	22A	22C	20.90	23.10	1	18.80	1	19.9	30.6
P6SMB24A	P6SMB24CA	24A	24C	22.80	25.20	1	20.50	1	18.4	33.2
P6SMB27A	P6SMB27CA	27A	27C	25.70	28.40	1	23.10	1	16.3	37.5
P6SMB30A	P6SMB30CA	30A	30C	28.50	31.50	1	25.60	1	14.7	41.4
P6SMB33A	P6SMB33CA	33A	33C	31.40	34.70	1	28.20	1	13.3	45.7
P6SMB36A	P6SMB36CA	36A	36C	34.20	37.80	1	30.80	1	12.2	49.9
P6SMB39A	P6SMB39CA	39A	39C	37.10	41.00	1	33.30	1	11.3	53.9
P6SMB43A	P6SMB43CA	43A	43C	40.90	45.20	1	36.80	1	10.3	59.3
P6SMB47A	P6SMB47CA	47A	47C	44.70	49.40	1	40.20	1	9.4	64.8
P6SMB51A	P6SMB51CA	51A	51C	48.50	53.60	1	43.60	1	8.7	70.1
P6SMB56A	P6SMB56CA	56A	56C	53.20	58.80	1	47.80	1	7.9	77.0

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P6SMB58A	P6SMB58CA	58A	58C	55.1	60.9	1	52.78	1	7.7	79.8
P6SMB62A	P6SMB62CA	62A	62C	58.9	65.1	1	53.00	1	7.2	85.0
P6SMB68A	P6SMB68CA	68A	68C	64.6	71.4	1	58.10	1	6.6	92.0
P6SMB75A	P6SMB75CA	75A	75C	71.3	78.8	1	64.10	1	5.9	103.0
P6SMB82A	P6SMB82CA	82A	82C	77.9	86.1	1	70.10	1	5.4	113.0
P6SMB91A	P6SMB91CA	91A	91C	86.5	95.5	1	77.80	1	4.9	125.0
P6SMB100A	P6SMB100CA	100A	100C	95.0	105.0	1	85.50	1	4.5	137.0
P6SMB110A	P6SMB110CA	110A	110C	105.0	116.0	1	94.00	1	4.0	152.0
P6SMB120A	P6SMB120CA	120A	120C	114.0	126.0	1	102.00	1	3.7	165.0
P6SMB130A	P6SMB130CA	130A	130C	124.0	137.0	1	111.00	1	3.4	179.0
P6SMB150A	P6SMB150CA	150A	150C	143.0	158.0	1	128.00	1	2.9	207.0
P6SMB160A	P6SMB160CA	160A	160C	152.0	168.0	1	136.00	1	2.8	219.0
P6SMB170A	P6SMB170CA	170A	170C	162.0	179.0	1	145.00	1	2.6	234.0
P6SMB180A	P6SMB180CA	180A	180C	171.0	189.0	1	154.00	1	2.5	246.0
P6SMB200A	P6SMB200CA	200A	200C	190.0	210.0	1	171.00	1	2.2	274.0
P6SMB220A	P6SMB220CA	220A	220C	209.0	231.0	1	185.00	1	1.9	328.0
P6SMB250A	P6SMB250CA	250A	250C	237.0	263.0	1	214.00	1	1.8	344.0
P6SMB300A	P6SMB300CA	300A	300C	285.0	315.0	1	256.00	1	1.5	414.0
P6SMB350A*	P6SMB350CA*	350A	350C	332.0	368.0	1	300.00	1	1.3	482.0
P6SMB400A*	P6SMB400CA*	400A	400C	380.0	420.0	1	342.00	1	1.1	548.0
P6SMB440A*	P6SMB440CA*	440A	440C	418.0	462.0	1	376.00	1	1.0	602.0
P6SMB480A*	P6SMB480CA*	480A	480C	456.0	504.0	1	408.00	1	0.9	658.0
P6SMB510A*	P6SMB510CA*	510A	510C	485.0	535.0	1	434.00	1	0.9	698.0
P6SMB530A*	P6SMB530CA*	530A	530C	503.5	556.5	1	451.00	1	0.8	725.0
P6SMB540A*	P6SMB540CA*	540A	540C	513.0	567.0	1	460.00	1	0.8	740.0
P6SMB550A*	P6SMB550CA*	550A	550C	522.5	577.5	1	468.00	1	0.8	760.0
P6SMB600A*	P6SMB600CA*	600A	600C	570.0	630.0	1	512.00	1	0.75	828.0

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN , the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs .The parts with A are preferred.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.

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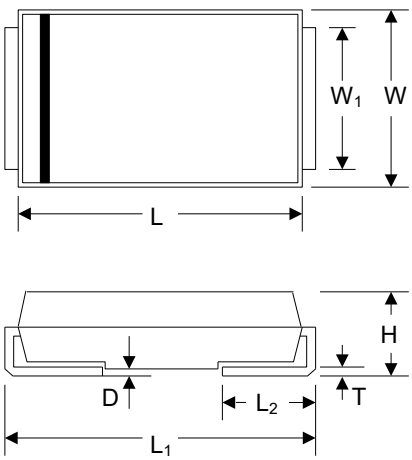
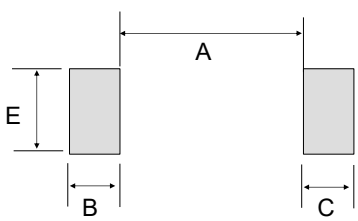
Package Outline Dimensions (DO-214AB)





Mounting Pad Layout

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	6.60	7.11	0.260	0.280
W	5.59	6.22	0.220	0.245
W_1	2.90	3.20	0.114	0.126
H	2.06	2.62	0.079	0.103
T	0.152	0.305	0.006	0.012
L_1	7.75	8.13	0.305	0.320
L_2	0.76	1.52	0.030	0.060
D	-	0.20	-	0.008
A	-	4.20	-	0.165
B	2.40	-	0.094	-
C	2.40	-	0.094	-
E	3.30	-	0.129	-

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMCJ5.0A	SMCJ5.0CA	GDE	BDE	6.40	7. 00	10	5.0	800	163.0	9.2
SMCJ6.0A	SMCJ6.0CA	GDG	BDG	6.67	7.37	10	6.0	800	145.7	10.3
SMCJ6.5A	SMCJ6.5CA	GDK	BDK	7.22	7.98	10	6.5	500	134.0	11.2
SMCJ7.0A	SMCJ7.0CA	GDM	BDM	7.78	8.60	10	7.0	200	125.0	12.0
SMCJ7.5A	SMCJ7.5CA	GDP	BDP	8.33	9.21	1	7.5	100	116.3	12.9
SMCJ8.0A	SMCJ8.0CA	GDR	BDR	8.89	9.83	1	8.0	50	110.3	13.6
SMCJ8.5A	SMCJ8.5CA	GDT	BDT	9.44	10.40	1	8.5	20	104.2	14.4
SMCJ9.0A	SMCJ9.0CA	GDV	BDV	10.00	11.10	1	9.0	10	97.4	15.4
SMCJ10A	SMCJ10CA	GDX	BDX	11.10	12.30	1	10.0	5	88.3	17.0
SMCJ11A	SMCJ11CA	GDZ	BDZ	12.20	13.50	1	11.0	1	82.5	18.2
SMCJ12A	SMCJ12CA	GEE	BEE	13.30	14.70	1	12.0	1	75.4	19.9
SMCJ13A	SMCJ13CA	GEG	BEG	14.40	15.90	1	13.0	1	69.8	21.5
SMCJ14A	SMCJ14CA	GEK	BEK	15.60	17.20	1	14.0	1	64.7	23.2
SMCJ15A	SMCJ15CA	GEM	BEM	16.70	18.50	1	15.0	1	61.5	24.4
SMCJ16A	SMCJ16CA	GEP	BEP	17.80	19.70	1	16.0	1	57.7	26.0
SMCJ17A	SMCJ17CA	GER	BER	18.90	20.90	1	17.0	1	54.4	27.6
SMCJ18A	SMCJ18CA	GET	BET	20.00	22.10	1	18.0	1	51.4	29.2
SMCJ20A	SMCJ20CA	GEV	BEV	22.20	24.50	1	20.0	1	46.3	32.4
SMCJ22A	SMCJ22CA	GEX	BEX	24.40	26.90	1	22.0	1	42.3	35.5
SMCJ24A	SMCJ24CA	GEZ	BEZ	26.70	29.50	1	24.0	1	38.6	38.9
SMCJ26A	SMCJ26CA	GFE	BFE	28.90	31.90	1	26.0	1	35.7	42.1
SMCJ28A	SMCJ28CA	GFG	BFG	31.10	34.40	1	28.0	1	33.1	45.4
SMCJ30A	SMCJ30CA	GFK	BFK	33.30	36.80	1	30.0	1	31.0	48.4
SMCJ33A	SMCJ33CA	GFM	BFM	36.70	40.60	1	33.0	1	28.2	53.3
SMCJ36A	SMCJ36CA	GFP	BFP	40.00	44.20	1	36.0	1	25.9	58.1
SMCJ40A	SMCJ40CA	GFR	BFR	44.40	49.10	1	40.0	1	23.3	64.5
SMCJ43A	SMCJ43CA	GFT	BFT	47.80	52.80	1	43.0	1	21.7	69.4
SMCJ45A	SMCJ45CA	GFV	BFV	50.00	55.30	1	45.0	1	20.6	72.7
SMCJ48A	SMCJ48CA	GFX	BFX	53.30	58.90	1	48.0	1	19.4	77.4

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
SMCJ51A	SMCJ51CA	GFZ	BFZ	56.7	62.7	1	51	1	18.2	82.4
SMCJ54A	SMCJ54CA	GGE	BGE	60.0	66.3	1	54	1	17.3	87.1
SMCJ58A	SMCJ58CA	GGG	BGG	64.4	71.2	1	58	1	16.1	93.6
SMCJ60A	SMCJ60CA	GGK	BGK	66.7	73.7	1	60	1	15.5	96.8
SMCJ64A	SMCJ64CA	GGM	BGM	71.1	78.6	1	64	1	14.6	103.0
SMCJ70A	SMCJ70CA	GGP	BGP	77.8	86.0	1	70	1	13.3	113.0
SMCJ75A	SMCJ75CA	GGR	BGR	83.3	92.1	1	75	1	12.4	121.0
SMCJ78A	SMCJ78CA	GGT	BGT	86.7	95.8	1	78	1	11.9	126.0
SMCJ85A	SMCJ85CA	GGV	BGV	94.4	104.0	1	85	1	11.0	137.0
SMCJ90A	SMCJ90CA	GGX	BGX	100.0	111.0	1	90	1	10.3	146.0
SMCJ100A	SMCJ100CA	GGZ	BGZ	111.0	123.0	1	100	1	9.3	162.0
SMCJ110A	SMCJ110CA	GHE	BHE	122.0	135.0	1	110	1	8.5	177.0
SMCJ120A	SMCJ120CA	GHG	BHG	133.0	147.0	1	120	1	7.8	193.0
SMCJ130A	SMCJ130CA	GHK	BHK	144.0	159.0	1	130	1	7.2	209.0
SMCJ150A	SMCJ150CA	GHM	BHM	167.0	185.0	1	150	1	6.2	243.0
SMCJ160A	SMCJ160CA	GHP	BHP	178.0	197.0	1	160	1	5.8	259.0
SMCJ170A	SMCJ170CA	GHR	BHR	189.0	209.0	1	170	1	5.5	275.0
SMCJ180A	SMCJ180CA	GHT	BHT	201.0	222.0	1	180	1	5.1	292.0
SMCJ200A	SMCJ200CA	GHV	BHV	224.0	247.0	1	200	1	4.6	324.0
SMCJ220A	SMCJ220CA	GHX	BHX	246.0	272.0	1	220	1	4.2	356.0
SMCJ250A	SMCJ250CA	GHZ	BHZ	279.0	309.0	1	250	1	3.7	405.0
SMCJ300A	SMCJ300CA	GJE	BJE	335.0	371.0	1	300	1	3.1	486.0
SMCJ350A	SMCJ350CA	GJG	BJG	391.0	432.0	1	350	1	2.6	567.0
SMCJ400A	SMCJ400CA	GJK	BJK	447.0	494.0	1	400	1	2.3	648.0
SMCJ440A	SMCJ440CA	GJM	BJM	492.0	543.0	1	440	1	2.1	713.0

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN , the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
1.5SMC6.8A	1.5SMC6.8CA	6V8A	6V8C	6.45	7.14	10	5.80	1000	144.8	10.5
1.5SMC7.5A	1.5SMC7.5CA	7V5A	7V5C	7.13	7.88	10	6.40	500	134.5	11.3
1.5SMC8.2A	1.5SMC8.2CA	8V2A	8V2C	7.79	8.61	10	7.02	200	125.6	12.1
1.5SMC9.1A	1.5SMC9.1CA	9V1A	9V1C	8.65	9.50	1	7.78	50	113.4	13.4
1.5SMC10A	1.5SMC10CA	10A	10C	9.50	10.50	1	8.55	10	104.8	14.5
1.5SMC11A	1.5SMC11CA	11A	11C	10.50	11.60	1	9.40	5	97.4	15.6
1.5SMC12A	1.5SMC12CA	12A	12C	11.40	12.60	1	10.20	5	91.0	16.7
1.5SMC13A	1.5SMC13CA	13A	13C	12.40	13.70	1	11.10	1	83.5	18.2
1.5SMC15A	1.5SMC15CA	15A	15C	14.30	15.80	1	12.80	1	71.7	21.2
1.5SMC16A	1.5SMC16CA	16A	16C	15.20	16.80	1	13.60	1	67.6	22.5
1.5SMC18A	1.5SMC18CA	18A	18C	17.10	18.90	1	15.30	1	60.3	25.2
1.5SMC20A	1.5SMC20CA	20A	20C	19.00	21.00	1	17.10	1	54.9	27.7
1.5SMC22A	1.5SMC22CA	22A	22C	20.90	23.10	1	18.80	1	49.7	30.6
1.5SMC24A	1.5SMC24CA	24A	24C	22.80	25.20	1	20.50	1	45.8	33.2
1.5SMC27A	1.5SMC27CA	27A	27C	25.70	28.40	1	23.10	1	40.5	37.5
1.5SMC30A	1.5SMC30CA	30A	30C	28.50	31.50	1	25.60	1	36.7	41.4
1.5SMC33A	1.5SMC33CA	33A	33C	31.40	34.70	1	28.20	1	33.3	45.7
1.5SMC36A	1.5SMC36CA	36A	36C	34.20	37.80	1	30.80	1	30.5	49.9
1.5SMC39A	1.5SMC39CA	39A	39C	37.10	41.00	1	33.30	1	28.2	53.9
1.5SMC43A	1.5SMC43CA	43A	43C	40.90	45.20	1	36.80	1	25.6	59.3
1.5SMC47A	1.5SMC47CA	47A	47C	44.70	49.40	1	40.20	1	23.5	64.8
1.5SMC51A	1.5SMC51CA	51A	51C	48.50	53.60	1	43.60	1	21.7	70.1
1.5SMC56A	1.5SMC56CA	56A	56C	53.20	58.80	1	47.80	1	19.7	77.0
1.5SMC62A	1.5SMC62CA	62A	62C	58.90	65.10	1	53.00	1	17.9	85.0
1.5SMC68A	1.5SMC68CA	68A	68C	64.60	71.40	1	58.10	1	16.5	92.0

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
1.5SMC75A	1.5SMC75CA	75A	75C	71.3	78.8	1	64.1	1	14.8	103
1.5SMC82A	1.5SMC82CA	82A	82C	77.9	86.1	1	70.1	1	13.5	113
1.5SMC91A	1.5SMC91CA	91A	91C	86.5	95.5	1	77.8	1	12.2	125
1.5SMC100A	1.5SMC100CA	100A	100C	95.0	105.0	1	85.5	1	11.1	137
1.5SMC110A	1.5SMC110CA	110A	110C	105.0	116.0	1	94.0	1	10.0	152
1.5SMC120A	1.5SMC120CA	120A	120C	114.0	126.0	1	102.0	1	9.2	165
1.5SMC130A	1.5SMC130CA	130A	130C	124.0	137.0	1	111.0	1	8.5	179
1.5SMC150A	1.5SMC150CA	150A	150C	143.0	158.0	1	128.0	1	7.3	207
1.5SMC160A	1.5SMC160CA	160A	160C	152.0	168.0	1	136.0	1	6.9	219
1.5SMC170A	1.5SMC170CA	170A	170C	162.0	179.0	1	145.0	1	6.5	234
1.5SMC180A	1.5SMC180CA	180A	180C	171.0	189.0	1	154.0	1	6.2	246
1.5SMC200A	1.5SMC200CA	200A	200C	190.0	210.0	1	171.0	1	5.5	274
1.5SMC220A	1.5SMC220CA	220A	220C	209.0	231.0	1	185.0	1	4.6	328
1.5SMC250A	1.5SMC250CA	250A	250C	237.0	263.0	1	214.0	1	4.4	344
1.5SMC300A	1.5SMC300CA	300A	300C	285.0	315.0	1	256.0	1	3.7	414
1.5SMC350A*	1.5SMC350CA*	350A	350C	332.0	368.0	1	300.0	1	4.2	482
1.5SMC400A*	1.5SMC400CA*	400A	400C	380.0	420.0	1	342.0	1	3.7	548
1.5SMC440A*	1.5SMC440CA*	440A	440C	418.0	462.0	1	376.0	1	3.4	602
1.5SMC480A*	1.5SMC480CA*	480A	480C	456.0	504.0	1	408.0	1	3.1	658
1.5SMC510A*	1.5SMC510CA*	510A	510C	485.0	535.0	1	434.0	1	2.9	698
1.5SMC530A*	1.5SMC530CA*	530A	530C	503.5	556.5	1	451.0	1	2.8	725
1.5SMC540A*	1.5SMC540CA*	540A	540C	513.0	567.0	1	460.0	1	2.8	740
1.5SMC550A*	1.5SMC550CA*	550A	550C	522.5	577.5	1	468.0	1	2.7	760
1.5SMC600A*	1.5SMC600CA*	600A	600C	570.0	630.0	1	512.0	1	2.5	828

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN , the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs .The parts with A are preferred.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
3.0SMCJ5.0	3.0SMCJ5.0C	3CAD	3CWD	6.40	7.82	10.0	5.0	1000.0	312.5	9.6
3.0SMCJ5.0A	3.0SMCJ5.0CA	3CAE	3CWE	6.40	7.07	10.0	5.0	1000.0	326.1	9.2
3.0SMCJ6.0	3.0SMCJ6.0C	3CAF	3CWF	6.67	8.15	10.0	6.0	1000.0	263.2	11.4
3.0SMCJ6.0A	3.0SMCJ6.0CA	3CAG	3CWG	6.67	7.37	10.0	6.0	1000.0	291.3	10.3
3.0SMCJ6.5	3.0SMCJ6.5C	3CAH	3CWH	7.22	8.82	10.0	6.5	500.0	243.9	12.3
3.0SMCJ6.5A	3.0SMCJ6.5CA	3CAK	3CWK	7.22	7.98	10.0	6.5	500.0	267.9	11.2
3.0SMCJ6.8	3.0SMCJ6.8C	3CED	3CFD	7.56	9.22	10.0	6.8	500.0	247.9	12.1
3.0SMCJ6.8A	3.0SMCJ6.8CA	3CEE	3CFE	7.56	8.35	10.0	6.8	500.0	250.0	12.0
3.0SMCJ7.0	3.0SMCJ7.0C	3CAL	3CWL	7.78	9.51	10.0	7.0	200.0	225.6	13.3
3.0SMCJ7.0A	3.0SMCJ7.0CA	3CAM	3CWM	7.78	8.60	10.0	7.0	200.0	250.0	12.0
3.0SMCJ7.5	3.0SMCJ7.5C	3CAN	3CWN	8.33	10.20	1.0	7.5	100.0	209.8	14.3
3.0SMCJ7.5A	3.0SMCJ7.5CA	3CAP	3CWP	8.33	9.21	1.0	7.5	100.0	232.6	12.9
3.0SMCJ8.0	3.0SMCJ8.0C	3CAQ	3CWQ	8.89	10.90	1.0	8.0	50.0	200.0	15.0
3.0SMCJ8.0A	3.0SMCJ8.0CA	3CAR	3CWR	8.89	9.83	1.0	8.0	50.0	220.6	13.6
3.0SMCJ8.5	3.0SMCJ8.5C	3CAS	3CWS	9.44	11.50	1.0	8.5	20.0	188.7	15.9
3.0SMCJ8.5A	3.0SMCJ8.5CA	3CAT	3CWT	9.44	10.40	1.0	8.5	20.0	208.3	14.4
3.0SMCJ9.0	3.0SMCJ9.0C	3CAU	3CWU	10.00	12.20	1.0	9.0	10.0	177.5	16.9
3.0SMCJ9.0A	3.0SMCJ9.0CA	3CAV	3CWV	10.00	11.10	1.0	9.0	10.0	194.8	15.4
3.0SMCJ10	3.0SMCJ10C	3CAW	3CWW	11.10	13.60	1.0	10.0	3.0	159.6	18.8
3.0SMCJ10A	3.0SMCJ10CA	3CAX	3CWX	11.10	12.30	1.0	10.0	3.0	176.5	17.0
3.0SMCJ11	3.0SMCJ11C	3CAY	3CWY	12.20	14.90	1.0	11.0	3.0	149.3	20.1
3.0SMCJ11A	3.0SMCJ11CA	3CAZ	3CWZ	12.20	13.50	1.0	11.0	3.0	164.8	18.2
3.0SMCJ12	3.0SMCJ12C	3CBD	3CXD	13.30	16.30	1.0	12.0	3.0	136.4	22.0
3.0SMCJ12A	3.0SMCJ12CA	3CBE	3CXE	13.30	14.70	1.0	12.0	3.0	150.8	19.9
3.0SMCJ13	3.0SMCJ13C	3CBF	3CXF	14.40	17.60	1.0	13.0	3.0	126.1	23.8
3.0SMCJ13A	3.0SMCJ13CA	3CBG	3CXG	14.40	15.90	1.0	13.0	3.0	139.5	21.5
3.0SMCJ14	3.0SMCJ14C	3CBH	3CXH	15.60	19.10	1.0	14.0	3.0	116.3	25.8
3.0SMCJ14A	3.0SMCJ14CA	3CBK	3CXK	15.60	17.20	1.0	14.0	3.0	129.3	23.2
3.0SMCJ15	3.0SMCJ15C	3CBL	3CXL	16.70	20.40	1.0	15.0	3.0	111.5	26.9
3.0SMCJ15A	3.0SMCJ15CA	3CBM	3CXM	16.70	18.50	1.0	15.0	3.0	123.0	24.4
3.0SMCJ16	3.0SMCJ16C	3CBN	3CXN	17.80	21.80	1.0	16.0	3.0	104.2	28.8
3.0SMCJ16A	3.0SMCJ16CA	3CBP	3CXP	17.80	19.70	1.0	16.0	3.0	115.4	26.0

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
3.0SMCJ17	3.0SMCJ17C	3CBQ	3CXQ	18.9	23.1	1.0	17	3.0	98.4	30.5
3.0SMCJ17A	3.0SMCJ17CA	3CBR	3CXR	18.9	20.9	1.0	17	3.0	108.7	27.6
3.0SMCJ18	3.0SMCJ18C	3CBS	3CXS	20.0	24.4	1.0	18	3.0	93.2	32.2
3.0SMCJ18A	3.0SMCJ18CA	3CBT	3CXT	20.0	22.1	1.0	18	3.0	102.7	29.2
3.0SMCJ20	3.0SMCJ20C	3CBU	3CXU	22.2	27.1	1.0	20	3.0	83.8	35.8
3.0SMCJ20A	3.0SMCJ20CA	3CBV	3CXV	22.2	24.5	1.0	20	3.0	92.6	32.4
3.0SMCJ22	3.0SMCJ22C	3CBW	3CXW	24.4	29.8	1.0	22	3.0	76.1	39.4
3.0SMCJ22A	3.0SMCJ22CA	3CBX	3CXX	24.4	26.9	1.0	22	3.0	84.5	35.5
3.0SMCJ24	3.0SMCJ24C	3CBY	3CXY	26.7	32.6	1.0	24	3.0	69.8	43.0
3.0SMCJ24A	3.0SMCJ24CA	3CBZ	3CXZ	26.7	29.5	1.0	24	3.0	77.1	38.9
3.0SMCJ26	3.0SMCJ26C	3CCD	3CYD	28.9	35.3	1.0	26	3.0	64.4	46.6
3.0SMCJ26A	3.0SMCJ26CA	3CCE	3CYE	28.9	31.9	1.0	26	3.0	71.3	42.1
3.0SMCJ28	3.0SMCJ28C	3CCF	3CYF	31.1	38.0	1.0	28	3.0	60.0	50.0
3.0SMCJ28A	3.0SMCJ28CA	3CCG	3CYG	31.1	34.4	1.0	28	3.0	66.1	45.4
3.0SMCJ30	3.0SMCJ30C	3CCH	3CYH	33.3	40.7	1.0	30	3.0	56.1	53.5
3.0SMCJ30A	3.0SMCJ30CA	3CCK	3CYK	33.3	36.8	1.0	30	3.0	62.0	48.4
3.0SMCJ33	3.0SMCJ33C	3CCL	3CYL	36.7	44.9	1.0	33	3.0	50.8	59.0
3.0SMCJ33A	3.0SMCJ33CA	3CCM	3CYM	36.7	40.6	1.0	33	3.0	56.3	53.3
3.0SMCJ36	3.0SMCJ36C	3CCN	3CYN	40.0	48.9	1.0	36	3.0	46.7	64.3
3.0SMCJ36A	3.0SMCJ36CA	3CCP	3CYP	40.0	44.2	1.0	36	3.0	51.6	58.1
3.0SMCJ40	3.0SMCJ40C	3CCQ	3CYQ	44.4	54.3	1.0	40	3.0	42.0	71.4
3.0SMCJ40A	3.0SMCJ40CA	3CCR	3CYR	44.4	49.1	1.0	40	3.0	46.5	64.5
3.0SMCJ43	3.0SMCJ43C	3CCS	3CYS	47.8	58.4	1.0	43	3.0	39.1	76.7
3.0SMCJ43A	3.0SMCJ43CA	3CCT	3CYT	47.8	52.8	1.0	43	3.0	43.2	69.4
3.0SMCJ45	3.0SMCJ45C	3CCU	3CYU	50.0	61.1	1.0	45	3.0	37.4	80.3
3.0SMCJ45A	3.0SMCJ45CA	3CCV	3CYV	50.0	55.3	1.0	45	3.0	41.3	72.7
3.0SMCJ48	3.0SMCJ48C	3CCW	3CYW	53.3	65.1	1.0	48	3.0	35.1	85.5
3.0SMCJ48A	3.0SMCJ48CA	3CCX	3CYX	53.3	58.9	1.0	48	3.0	38.8	77.4
3.0SMCJ51	3.0SMCJ51C	3CCY	3CYY	56.7	69.3	1.0	51	3.0	32.9	91.1
3.0SMCJ51A	3.0SMCJ51CA	3CCZ	3CYZ	56.7	62.7	1.0	51	3.0	36.4	82.4
3.0SMCJ54	3.0SMCJ54C	3CRD	3CZD	60.0	73.3	1.0	54	3.0	31.2	96.3
3.0SMCJ54A	3.0SMCJ54CA	3CRE	3CZE	60.0	66.3	1.0	54	3.0	34.4	87.1

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
3.0SMCJ58	3.0SMCJ58C	3CRF	3CZF	64.4	78.7	1.0	58	30	29.1	103.0
3.0SMCJ58A	3.0SMCJ58CA	3CRG	3CZG	64.4	71.2	1.0	58	3.0	32.1	93.6
3.0SMCJ60	3.0SMCJ60C	3CRH	3CZH	66.7	81.5	1.0	60	3.0	28.0	107.0
3.0SMCJ60A	3.0SMCJ60CA	3CRK	3CZK	66.7	73.7	1.0	60	3.0	31.0	96.8
3.0SMCJ64	3.0SMCJ64C	3CRN	3CZN	71.1	86.9	1.0	64	3.0	26.3	114.0
3.0SMCJ64A	3.0SMCJ64CA	3CRP	3CZP	71.1	78.6	1.0	64	3.0	29.1	103.0
3.0SMCJ68	3.0SMCJ68C	3CRB	3CZB	75.5	92.3	1.0	68	3.0	24.8	121.0
3.0SMCJ68A	3.0SMCJ68CA	3CRC	3CZC	75.5	83.5	1.0	68	3.0	27.5	109.0
3.0SMCJ70	3.0SMCJ70C	3CEH	3CFH	77.8	95.1	1.0	70	3.0	24.0	125.0
3.0SMCJ70A	3.0SMCJ70CA	3CEK	3CFK	77.8	86.0	1.0	70	3.0	26.5	113.0
3.0SMCJ75	3.0SMCJ75C	3CRQ	3CZQ	83.3	102.0	1.0	75	3.0	22.4	134.0
3.0SMCJ75A	3.0SMCJ75CA	3CRR	3CZR	83.3	92.1	1.0	75	3.0	24.8	121.0
3.0SMCJ78	3.0SMCJ78C	3CRS	3CZS	86.7	106.0	1.0	78	3.0	21.6	139.0
3.0SMCJ78A	3.0SMCJ78CA	3CRT	3CZT	86.7	95.8	1.0	78	3.0	23.8	126.0
3.0SMCJ85	3.0SMCJ85C	3CRU	3CZU	94.4	115.0	1.0	85	3.0	19.9	151.0
3.0SMCJ85A	3.0SMCJ85CA	3CRV	3CZV	94.4	104.0	1.0	85	3.0	21.9	137.0
3.0SMCJ90	3.0SMCJ90C	3CRW	3CZW	100.0	122.0	1.0	90	3.0	18.8	160.0
3.0SMCJ90A	3.0SMCJ90CA	3CRX	3CZX	100.0	111.0	1.0	90	3.0	20.5	146.0
3.0SMCJ100	3.0SMCJ100C	3CRY	3CZY	111.0	136.0	1.0	100	3.0	16.8	179.0
3.0SMCJ100A	3.0SMCJ100CA	3CRZ	3CZZ	111.0	123.0	1.0	100	3.0	18.5	162.0
3.0SMCJ110	3.0SMCJ110C	3CSD	3CVD	122.0	149.0	1.0	110	3.0	15.3	196.0
3.0SMCJ110A	3.0SMCJ110CA	3CSE	3CVE	122.0	135.0	1.0	110	3.0	16.9	177.0
3.0SMCJ120	3.0SMCJ120C	3CSF	3CVF	133.0	163.0	1.0	120	3.0	14.0	214.0
3.0SMCJ120A	3.0SMCJ120CA	3CSG	3CVG	133.0	147.0	1.0	120	3.0	15.5	193.0
3.0SMCJ130	3.0SMCJ130C	3CSH	3CVH	144.0	176.0	1.0	130	3.0	13.0	231.0
3.0SMCJ130A	3.0SMCJ130CA	3CSK	3CVK	144.0	159.0	1.0	130	3.0	14.4	209.0
3.0SMCJ150	3.0SMCJ150C	3CSL	3CVL	167.0	204.0	1.0	150	3.0	11.2	268.0
3.0SMCJ150A	3.0SMCJ150CA	3CSM	3CVM	167.0	185.0	1.0	150	3.0	12.3	243.0
3.0SMCJ160	3.0SMCJ160C	3CSN	3CVN	178.0	218.0	1.0	160	3.0	10.5	287.0
3.0SMCJ160A	3.0SMCJ160CA	3CSP	3CVP	178.0	197.0	1.0	160	3.0	11.6	259.0
3.0SMCJ170	3.0SMCJ170C	3CSQ	3CVQ	189.0	231.0	1.0	170	3.0	9.9	304.0
3.0SMCJ170A	3.0SMCJ170CA	3CSR	3CVR	189.0	209.0	1.0	170	3.0	10.9	275.0

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
				Min	Max					
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
3.0SMCJ188	3.0SMCJ188C	3CST	3CVT	209	255	1.0	188	3.0	8.7	344
3.0SMCJ188A	3.0SMCJ188CA	3CSS	3CVS	209	231	1.0	188	3.0	9.1	328
3.0SMCJ200	3.0SMCJ200C	3CSU	3CVU	222	272	1.0	200	3.0	8.4	356
3.0SMCJ200A	3.0SMCJ200CA	3CSV	3CVV	222	246	1.0	200	3.0	9.3	323
3.0SMCJ220	3.0SMCJ220C	3CSW	3CVW	245	299	1.0	220	3.0	7.7	392
3.0SMCJ220A	3.0SMCJ220CA	3CSX	3CVX	245	270	1.0	220	3.0	8.5	355
3.0SMCJ240	3.0SMCJ240C	3CSY	3CVY	267	326	1.0	240	3.0	7.0	428
3.0SMCJ240A	3.0SMCJ240CA	3CSZ	3CVZ	267	295	1.0	240	3.0	7.7	388
3.0SMCJ250	3.0SMCJ250C	3CTS	3CUS	278	340	1.0	250	3.0	6.7	446
3.0SMCJ250A	3.0SMCJ250CA	3CTT	3CUT	278	307	1.0	250	3.0	7.4	404
3.0SMCJ300	3.0SMCJ300C	3CTF	3CUF	333	408	1.0	300	3.0	5.6	535
3.0SMCJ300A	3.0SMCJ300CA	3CTG	3CUG	333	368	1.0	300	3.0	6.2	485
3.0SMCJ350	3.0SMCJ350C	3CTQ	3CUQ	389	476	1.0	350	3.0	4.8	624
3.0SMCJ350A	3.0SMCJ350CA	3CTR	3CUR	389	429	1.0	350	3.0	5.3	566
3.0SMCJ360	3.0SMCJ360C	3CTH	3CUH	400	489	1.0	360	3.0	4.6	652
3.0SMCJ360A	3.0SMCJ360CA	3CTK	3CUK	400	442	1.0	360	3.0	5.2	582
3.0SMCJ400	3.0SMCJ400C	3CTL	3CUL	445	544	1.0	400	3.0	4.2	713
3.0SMCJ400A	3.0SMCJ400CA	3CTM	3CUM	445	491	1.0	400	3.0	4.6	646
3.0SMCJ440	3.0SMCJ440C	3CTN	3CUN	489	598	1.0	440	3.0	3.8	784
3.0SMCJ440A	3.0SMCJ440CA	3CTP	3CUP	489	540	1.0	440	3.0	4.2	711

Notes:

1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN, the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

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TVS Diodes

Transient Voltage Suppression Diodes

SMDJ (DO - 214AB)

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM} (10/1000 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (10/1000 μS)	Max. Peak Pulse Current I_{PPM} (8/20 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (8/20 μS)
				Min	Max							
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)	(A)	(V)
SMDJ5.0A	SMDJ5.0CA	RDE	DDE	6.40	7.00	10	5.0	800	326.1	9.2	1630.5	11.89
SMDJ6.0A	SMDJ6.0CA	RDG	DDG	6.67	7.37	10	6.0	800	291.3	10.3	1456.5	13.31
SMDJ6.5A	SMDJ6.5CA	RDK	DDK	7.22	7.98	10	6.5	500	267.9	11.2	1339.5	14.47
SMDJ7.0A	SMDJ7.0CA	PDM	DDM	7.78	8.60	10	7.0	200	250.0	12.0	1250.0	15.5
SMDJ7.5A	SMDJ7.5CA	PDP	DDP	8.33	9.21	1	7.5	100	232.6	12.9	1163.0	16.67
SMDJ8.0A	SMDJ8.0CA	PDR	DDR	8.89	9.83	1	8.0	50	220.6	13.6	1103.0	17.57
SMDJ8.5A	SMDJ8.5CA	PDT	DDT	9.44	10.40	1	8.5	20	208.3	14.4	1041.5	18.60
SMDJ9.0A	SMDJ9.0CA	PDV	DDV	10.00	11.10	1	9.0	10	194.8	15.4	974.0	19.90
SMDJ10A	SMDJ10CA	PDX	DDX	11.10	12.30	1	10.0	5	176.5	17.0	882.5	21.96
SMDJ11A	SMDJ11CA	PDZ	DDZ	12.20	13.50	1	11.0	2	164.8	18.2	824.0	23.51
SMDJ12A	SMDJ12CA	PEE	DEE	13.30	14.70	1	12.0	2	150.8	19.9	754.0	25.71
SMDJ13A	SMDJ13CA	PEG	DEG	14.40	15.90	1	13.0	2	139.5	21.5	697.5	27.78
SMDJ14A	SMDJ14CA	PEK	DEK	15.60	17.20	1	14.0	2	129.3	23.2	646.5	29.97
SMDJ15A	SMDJ15CA	PEM	DEM	16.70	18.50	1	15.0	2	123.0	24.4	615.0	31.52
SMDJ16A	SMDJ16CA	PEP	DEP	17.80	19.70	1	16.0	2	115.4	26.0	577.0	33.59
SMDJ17A	SMDJ17CA	PER	DER	18.90	20.90	1	17.0	2	108.7	27.6	543.5	35.66
SMDJ18A	SMDJ18CA	PET	DET	20.00	22.10	1	18.0	2	102.7	29.2	513.5	37.73
SMDJ20A	SMDJ20CA	PEV	DEV	22.20	24.50	1	20.0	2	92.6	32.4	463.0	41.86
SMDJ22A	SMDJ22CA	PEX	DEX	24.40	26.90	1	22.0	2	84.5	35.5	422.5	45.87
SMDJ24A	SMDJ24CA	PEZ	DEZ	26.70	29.50	1	24.0	2	77.1	38.9	385.5	50.26
SMDJ26A	SMDJ26CA	PFE	DFE	28.90	31.90	1	26.0	2	71.3	42.1	356.5	54.39
SMDJ28A	SMDJ28CA	PFG	DFG	31.10	34.40	1	28.0	2	66.1	45.4	330.5	58.66
SMDJ30A	SMDJ30CA	PFK	DFK	33.30	36.80	1	30.0	2	62.0	48.4	310.0	62.53
SMDJ33A	SMDJ33CA	PFM	DFM	36.70	40.60	1	33.0	2	56.3	53.3	281.5	68.86
SMDJ36A	SMDJ36CA	PFP	DFP	40.00	44.20	1	36.0	2	51.6	58.1	258.0	75.06

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM} (10/1000 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (10/1000 μS)	Max. Peak Pulse Current I_{PPM} (8/20 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (8/20 μS)
				Min	Max							
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)	(A)	(V)
SMDJ40A	SMDJ40CA	PFR	DFR	44.4	49.1	1	40	2	46.5	64.5	232.5	83.33
SMDJ43A	SMDJ43CA	PFT	DFT	47.8	52.8	1	43	2	43.2	69.4	216.0	89.66
SMDJ45A	SMDJ45CA	PFV	DFV	50.0	55.3	1	45	2	41.3	72.7	206.5	93.93
SMDJ48A	SMDJ48CA	PFX	DFX	53.3	58.9	1	48	2	38.8	77.4	194.0	100.00
SMDJ51A	SMDJ51CA	PFZ	DFZ	56.7	62.7	1	51	2	36.4	82.4	182.0	106.46
SMDJ54A	SMDJ54CA	RGE	DGE	60.0	66.3	1	54	2	34.4	87.1	172.0	112.53
SMDJ58A	SMDJ58CA	PGG	DGG	64.4	71.2	1	58	2	32.1	93.6	160.5	120.93
SMDJ60A	SMDJ60CA	PGK	DGK	66.7	73.7	1	60	2	31.0	96.8	155.0	125.06
SMDJ64A	SMDJ64CA	PGM	DGM	71.1	78.6	1	64	2	29.1	103.0	145.5	133.07
SMDJ70A	SMDJ70CA	PGP	DGP	77.8	86.0	1	70	2	26.5	113.0	132.5	145.99
SMDJ75A	SMDJ75CA	PGR	DGR	83.3	92.1	1	75	2	24.8	121.0	124.0	156.33
SMDJ78A	SMDJ78CA	PGT	DGT	86.7	95.8	1	78	2	23.8	126.0	119.0	162.79
SMDJ85A	SMDJ85CA	PGV	DGV	94.4	104.0	1	85	2	21.9	137.0	109.5	177.00
SMDJ90A	SMDJ90CA	PGX	DGX	100.0	111.0	1	90	2	20.5	146.0	102.5	188.63
SMDJ100A	SMDJ100CA	PGZ	DGZ	111.0	123.0	1	100	2	18.5	162.0	92.5	209.30
SMDJ110A	SMDJ110CA	PHE	DHE	122.0	135.0	1	110	2	16.9	177.0	84.5	228.68

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM} (10/1000 μS	Max. Clamping Voltage $V_C@I_{PPM}$ (10/1000 μS)	Max. Peak Pulse Current I_{PPM} (8/20 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (8/20 μS)
				Min	Max							
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)	(A)	(V)
SMDJ120A	SMDJ120CA	PHG	DHG	133	147	1	120	2	15.5	193	77.5	249.35
SMDJ130A	SMDJ130CA	PHK	DHK	144	159	1	130	2	14.4	209	72.0	270.03
SMDJ150A	-	PHM	-	167	185	1	150	2	12.3	243	61.5	313.95
-	SMDJ150CA*	-	DHM	167	185	1	150	2	12.3	243	61.5	313.95
SMDJ160A	-	PHP	-	178	197	1	160	2	11.6	259	58.0	334.63
-	SMDJ160CA*	-	DHP	178	197	1	160	2	11.6	259	58.0	334.63
SMDJ170A	-	PHR	-	189	209	1	170	2	10.9	275	54.5	355.30
-	SMDJ170CA*	-	DHR	189	209	1	170	2	10.9	275	54.5	355.30
SMDJ180A*	SMDJ180CA*	PHT	DHT	200	221	1	180	2	10.3	292	51.5	377.26
SMDJ200A*	SMDJ200CA*	PHV	DHV	224	247	1	200	2	9.3	324	46.5	418.60
SMDJ220A*	SMDJ220CA*	PKE	DKE	244	270	1	220	2	8.4	356	42.0	459.95
SMDJ250A*	SMDJ250CA*	PKG	DKG	279	309	1	250	2	7.6	405	37.5	523.26
SMDJ300A*	SMDJ300CA*	PKI	DKI	335	371	1	300	2	6.2	486	31.0	627.91
SMDJ350A*	SMDJ350CA*	PKJ	DKJ	391	432	1	350	2	5.4	567	26.5	732.56
SMDJ400A*	SMDJ400CA*	PKL	DKL	447	494	1	400	2	4.8	648	23.5	837.21
SMDJ440A*	SMDJ440CA*	PKN	DKN	492	543	1	440	2	4.4	713	21.5	921.19

Notes:
1. For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.
2. For parts without A in the PN, the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs. The parts with A are preferred.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM} (10/1000 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (10/1000 μS)	Max. Peak Pulse Current I_{PPM} (8/20 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (8/20 μS)
				Min	Max							
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)	(A)	(V)
5.0SMDJ12A	5.0SMDJ12CA	5PEP	5BEP	13.3	14.7	10	12	800	252.0	19.9	1890.0	25.7
5.0SMDJ13A	5.0SMDJ13CA	5PEQ	5BEQ	14.4	15.9	10	13	500	233.0	21.5	1747.5	27.8
5.0SMDJ14A	5.0SMDJ14CA	5PER	5BER	15.6	17.2	10	14	200	216.0	23.2	1620.0	30.0
5.0SMDJ15A	5.0SMDJ15CA	5PES	5BES	16.7	18.5	1	15	100	205.0	24.4	1537.5	31.5
5.0SMDJ16A	5.0SMDJ16CA	5PET	5BET	17.8	19.7	1	16	50	193.0	26.0	1447.5	33.6
5.0SMDJ17A	5.0SMDJ17CA	5PEU	5BEU	18.9	20.9	1	17	20	181.0	27.6	1357.5	35.7
5.0SMDJ18A	5.0SMDJ18CA	5PEV	5BEV	20.0	22.1	1	18	10	172.0	29.2	1290.0	37.7
5.0SMDJ20A	5.0SMDJ20CA	5PEW	5BEW	22.2	24.5	1	20	5	155.0	32.4	850.0	41.9
5.0SMDJ22A	5.0SMDJ22CA	5PEX	5BEX	24.4	26.9	1	22	5	141.0	35.5	1057.5	45.9
5.0SMDJ24A	5.0SMDJ24CA	5PEZ	5BEZ	26.7	29.5	1	24	5	129.0	38.9	967.5	50.3
5.0SMDJ26A	5.0SMDJ26CA	5PFE	5BFE	28.9	31.9	1	26	5	119.0	42.1	892.5	54.4
5.0SMDJ28A	5.0SMDJ28CA	5PFG	5BFG	31.1	34.4	1	28	5	110.0	45.4	825.0	58.7
5.0SMDJ30A	5.0SMDJ30CA	5PFK	5BFK	33.3	36.8	1	30	5	103.0	48.4	772.5	62.5
5.0SMDJ33A	5.0SMDJ33CA	5PFM	5BFM	36.7	40.6	1	33	5	93.9	53.3	704.3	68.9
5.0SMDJ36A	5.0SMDJ36CA	5PFP	5BFP	40.0	44.2	1	36	5	86.1	58.1	645.8	75.1
5.0SMDJ40A	5.0SMDJ40CA	5PFR	5BFR	44.4	49.1	1	40	5	77.6	64.5	582.0	83.3
5.0SMDJ43A	5.0SMDJ43CA	5PFT	5BFT	47.8	52.8	1	43	5	72.1	69.4	540.8	89.7
5.0SMDJ45A	5.0SMDJ45CA	5PFV	5BFV	50.0	55.3	1	45	5	68.8	72.7	516.0	93.9

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Model		Device Marking Code		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM} (10/1000 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (10/1000 μS)	Max. Peak Pulse Current I_{PPM} (8/20 μS)	Max. Clamping Voltage $V_C@I_{PPM}$ (8/20 μS)
				Min	Max							
Uni	Bi	Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)	(A)	(V)
5.0SMDJ48A	5.0SMDJ48CA	5PFX	5BFX	53.3	58.9	1	48	5	64.7	77.4	485.3	100.0
5.0SMDJ51A	5.0SMDJ51CA	5PFZ	5BFZ	56.7	62.7	1	51	5	60.7	82.4	455.3	106.5
5.0SMDJ54A	5.0SMDJ54CA	5PGE	5BGE	60.0	66.3	1	54	5	57.5	87.1	431.3	112.5
5.0SMDJ58A	5.0SMDJ58CA	5PGG	5BGG	64.4	71.2	1	58	5	53.5	93.6	401.3	120.9
5.0SMDJ60A	5.0SMDJ60CA	5PGK	5BGK	66.7	73.7	1	60	5	51.7	96.8	387.8	125.1
5.0SMDJ64A	5.0SMDJ64CA	5PGM	5BGM	71.1	78.6	1	64	5	48.6	103.0	364.5	133.1
5.0SMDJ70A	5.0SMDJ70CA	5PGP	5BGB	77.8	86.0	1	70	5	44.3	113.0	332.3	146.0
5.0SMDJ75A	5.0SMDJ75CA	5PGR	5BGR	83.3	92.1	1	75	5	41.4	121.0	310.5	156.3
5.0SMDJ78A	5.0SMDJ78CA	5PGT	5BGT	86.7	95.8	1	78	5	39.7	126.0	297.8	162.8
5.0SMDJ85A	5.0SMDJ85CA	5PGV	5BGV	94.4	104.0	1	85	5	36.5	137.0	273.8	177.0
5.0SMDJ90A	5.0SMDJ90CA	5PGX	5BGX	100.0	111.0	1	90	5	34.3	146.0	257.3	188.6
5.0SMDJ100A	5.0SMDJ100CA	5PGZ	5BGZ	111.0	123.0	1	100	5	30.9	162.0	231.8	209.3
5.0SMDJ110A	5.0SMDJ110CA	5PHE	5BHE	122.0	135.0	1	110	5	28.3	177.0	212.3	228.7
5.0SMDJ120A	5.0SMDJ120CA	5PHG	5BHG	133.0	147.0	1	120	5	26.0	193.0	195.0	249.4
5.0SMDJ130A	5.0SMDJ130CA	5PHK	5BHK	144.0	159.0	1	130	5	24.0	209.0	180.0	270.0
5.0SMDJ140A	5.0SMDJ140CA	5PHL	5BHL	156.0	172.0	1	140	5	22.2	226.1.0	166.5	292.1
5.0SMDJ150A	5.0SMDJ150CA	5PHM	5BHM	167.0	185.0	1	150	5	20.6	243.0	154.5	314.0
5.0SMDJ160A	5.0SMDJ160CA	5PHP	5BHB	178.0	197.0	1	160	5	19.3	259.0	144.8	334.6
5.0SMDJ170A	5.0SMDJ170CA	5PHR	5BHR	189.0	209.0	1	170	5	18.2	275.0	136.5	355.3

Notes:
1. For bidirectional type having V_R of 20 volts and less, the I_R should be doubled.
2. For parts without A in the PN , the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A .The parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

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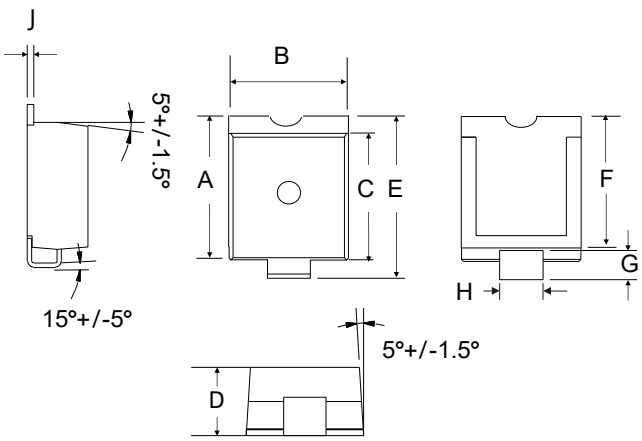
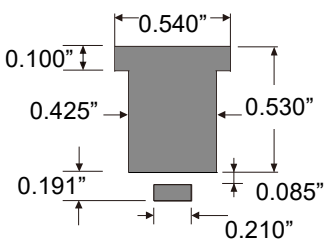
Package Outline Dimensions (SMTO-218)



Note: Coplanarity of solder side is controlled within 0.10mm

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	15.78	16.63	0.621	0.655
B	13.43	15.09	0.529	0.594
C	13.83	14.24	0.544	0.561
D	6.94	7.24	0.273	0.285
E	17.82	18.72	0.702	0.737
F	14.40	14.76	0.567	0.581
G	1.88	2.84	0.074	0.112
H	4.89	5.65	0.193	0.222
J	0.72	0.85	0.028	0.033



Mounting Pad Layout (Inch)

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Electrical Characteristics (T_A = 25 °C unless otherwise noted)

Model	Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_R	Breakdown Voltage V_{BR}@I_T Min Max		Test Current I_T	Max. Clamping Voltage V_{CL} @Peak Pulse Current (I_{PP})			Max. Temp Coefficient of V_{BR}	Max. Capacitance 0 Bias 10KHz
						V_{CL}	I_{PP}(8/20 μS)	I_{PP} (10/350 μS)		
			Min	Max			Min	Typical		
	(V)	(μA)	(V)		(mA)	(V)	(A)	(A)	(%/°C)	(nF)
SPC1-380C	380	10	401	443	10	520	1000	100	0.1	2.2
SPC1-430C	430	10	440	490	10	625	1000	100	0.1	2.2
SPC3-066C	66	10	75	83	40	120	3000	800	0.1	6.0
SPC6-058C	58	10	64	70	10	110	6000	900	0.1	6.5
SPC6-066C	66	10	72	80	10	120	6000	900	0.1	5.5
SPC6-076C	76	10	85	95	10	140	6000	900	0.1	4.5
SPC10-058C	58	10	64	70	10	110	10000	1100	0.1	7.5
SPC10-066C	66	10	72	80	10	120	10000	1000	0.1	7.0
SPC10-076C	76	10	85	95	10	140	10000	1000	0.1	6.0
SPC10-086C	86	10	95	105	10	157	10000	1000	0.1	5.5

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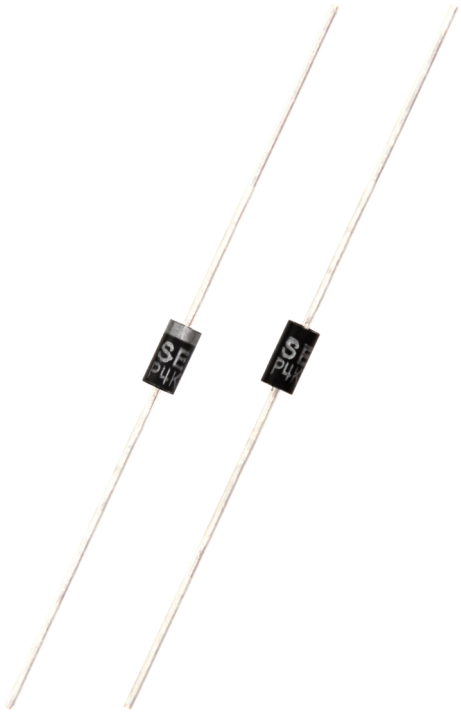
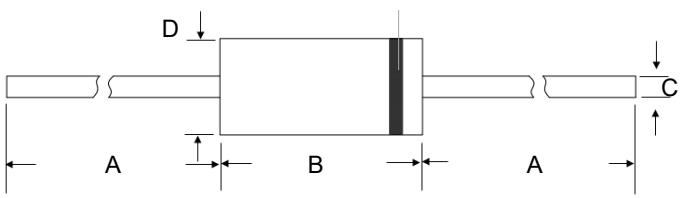


Package Outline Dimensions (DO-41)

Cathode Band (for uni-directional products only)



DO-41

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	4.10	5.20	0.160	0.205
C	0.71	0.86	0.028	0.034
D	2.00	2.70	0.080	0.107

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P4KE6.8A	P4KE6.8CA	6.45	7.14	10	5.80	1000	39.00	10.5
P4KE7.5A	P4KE7.5CA	7.13	7.88	10	6.40	500	36.30	11.3
P4KE8.2A	P4KE8.2CA	7.79	8.61	10	7.02	200	33.90	12.1
P4KE9.1A	P4KE9.1CA	8.65	9.55	1	7.78	50	30.60	13.4
P4KE10A	P4KE10CA	9.50	10.50	1	8.55	10	28.30	14.5
P4KE11A	P4KE11CA	10.50	11.60	1	9.40	5	26.30	15.6
P4KE12A	P4KE12CA	11.40	12.60	1	10.20	5	24.60	16.7
P4KE13A	P4KE13CA	12.40	13.70	1	11.10	1	22.50	18.2
P4KE15A	P4KE15CA	14.30	15.80	1	12.80	1	19.30	21.2
P4KE16A	P4KE16CA	15.20	16.80	1	13.60	1	18.20	22.5
P4KE18A	P4KE18CA	17.10	18.90	1	15.30	1	16.10	25.5
P4KE20A	P4KE20CA	19.00	21.00	1	17.10	1	14.80	27.7
P4KE22A	P4KE22CA	20.90	23.10	1	18.80	1	13.40	30.6
P4KE24A	P4KE24CA	22.80	25.20	1	20.50	1	12.30	33.2
P4KE27A	P4KE27CA	25.70	28.40	1	23.10	1	10.90	37.5
P4KE30A	P4KE30CA	28.50	31.50	1	25.60	1	9.90	41.4
P4KE33A	P4KE33CA	31.40	34.70	1	28.20	1	9.00	45.7
P4KE36A	P4KE36CA	34.20	37.80	1	30.80	1	8.20	49.9
P4KE39A	P4KE39CA	37.10	41.00	1	33.30	1	7.60	53.9
P4KE43A	P4KE43CA	40.90	45.20	1	36.80	1	6.90	59.3
P4KE47A	P4KE47CA	44.70	49.40	1	40.20	1	6.30	64.8
P4KE51A	P4KE51CA	48.50	53.60	1	43.60	1	5.80	70.1
P4KE56A	P4KE56CA	53.20	58.80	1	47.80	1	5.30	77.0
P4KE62A	P4KE62CA	58.90	65.10	1	53.00	1	4.80	85.0
P4KE68A	P4KE68CA	64.60	71.40	1	58.10	1	4.50	92.0

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P4KE75A	P4KE75CA	71.30	78.80	1	64.10	1	4.00	103.0
P4KE82A	P4KE82CA	77.90	86.10	1	70.10	1	3.60	113.0
P4KE91A	P4KE91CA	86.50	95.50	1	77.80	1	3.30	125.0
P4KE100A	P4KE100CA	95.00	105.00	1	85.50	1	3.00	137.0
P4KE110A	-	105.00	116.00	1	94.00	1	2.70	152.0
-	P4KE110CA*	105.00	116.00	1	94.00	1	4.00	152.0
P4KE120A	-	114.00	126.00	1	102.00	1	2.50	165.0
-	P4KE120CA*	114.00	126.00	1	102.00	1	3.70	165.0
P4KE130A	-	124.00	137.00	1	111.00	1	2.30	179.0
-	P4KE130CA*	124.00	137.00	1	111.00	1	3.40	179.0
P4KE150A	-	143.00	158.00	1	128.00	1	2.00	207.0
-	P4KE150CA*	143.00	158.00	1	128.00	1	2.90	207.0
P4KE160A	-	152.00	168.00	1	136.00	1	1.90	219.0
-	P4KE160CA*	152.00	168.00	1	136.00	1	2.80	219.0
P4KE170A	-	162.00	179.00	1	145.00	1	1.80	234.0
-	P4KE170CA*	162.00	179.00	1	145.00	1	2.60	234.0
P4KE180A	-	171.00	189.00	1	154.00	1	1.70	246.0
-	P4KE180CA*	171.00	189.00	1	154.00	1	2.50	246.0
P4KE200A	-	190.00	210.00	1	171.00	1	1.50	274.0
-	P4KE200CA*	190.00	210.00	1	171.00	1	2.20	274.0
P4KE220A	-	209.00	231.00	1	185.00	1	1.30	328.0
-	P4KE220CA*	209.00	231.00	1	185.00	1	1.90	328.0
P4KE250A	-	237.00	263.00	1	214.00	1	1.20	344.0
-	P4KE250CA*	237.00	263.00	1	214.00	1	1.80	344.0
P4KE300A	-	285.00	315.00	1	256.00	1	1.00	414.0
-	P4KE300CA*	285.00	315.00	1	256.00	1	1.50	414.0
P4KE350A*	P4KE350CA*	332.00	368.00	1	300.00	1	1.30	482.0
P4KE400A*	P4KE400CA*	380.00	420.00	1	342.00	1	1.10	548.0
P4KE440A*	P4KE440CA*	418.00	462.00	1	376.00	1	1.00	602.0
P4KE480A*	P4KE480CA*	456.00	504.00	1	408.00	1	0.92	658.0
P4KE510A*	P4KE510CA*	485.00	535.00	1	434.00	1	0.86	698.0

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P4KE530A*	P4KE530CA*	503.50	556.50	1	451.00	1	0.83	725.0
P4KE540A*	P4KE540CA*	513.00	567.00	1	460.00	1	0.82	740.0
P4KE550A*	P4KE550CA*	522.50	577.50	1	468.00	1	0.79	760.0

Notes:
1. Measured of 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
2. V_F < 3.5 V for single die parts and V_F < 5.0 V for stacked-die parts.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.
4.For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.

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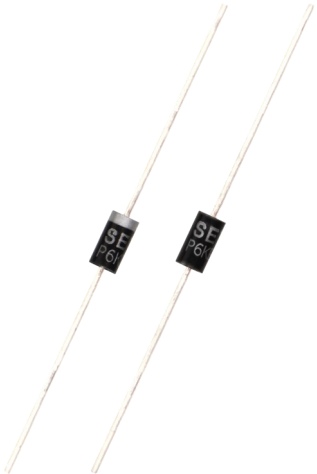
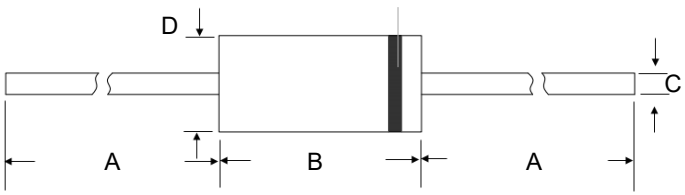


Package Outline Dimensions (DO-15)

Cathode Band (for uni-directional products only)



DO-15

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	5.80	7.60	0.230	0.300
C	0.71	0.86	0.028	0.034
D	2.60	3.60	0.104	0.140

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model	Breakdown Voltage V_{BR}@I_T Min	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage I_R@V_{WM}	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage at V_C@I_{PPM}=5.0 A	Max. Junction Capacitance @0 Volts	Working Inverse Blocking Voltage V_{WIB}	Inverse Blocking Leakage Current at I_{IB} @ V_{WIB}	Peak Inverse Blocking Voltage V_{PIB}
Uni	(V)	(V)	(μA)	(A)	(V)	(pF)	(V)	(mA)	(V)
SAC5.0	7.60	5.0	300	44.0	10.0	50	75	1.0	100
SAC6.0	7.90	6.0	300	41.0	11.2	50	75	1.0	100
SAC7.0	8.33	7.0	300	38.0	12.6	50	75	1.0	100
SAC8.0	8.89	8.0	100	36.0	13.4	50	75	1.0	100
SAC8.5	9.44	8.5	50	34.0	14.0	50	75	1.0	100
SAC10	11.10	10.0	5	29.0	16.3	50	75	1.0	100
SAC12	13.30	12.0	1	25.0	19.0	50	75	1.0	100
SAC15	16.70	15.0	1	20.0	23.6	50	75	1.0	100
SAC18	20.00	18.0	1	15.0	28.8	50	75	1.0	100
SAC22	24.40	22.0	1	14.0	35.4	50	75	1.0	100
SAC26	28.90	26.0	1	11.1	42.3	50	75	1.0	100
SAC30	33.30	30.0	1	10.0	48.6	50	75	1.0	100
SAC36	40.00	36.0	1	8.6	60.0	50	75	1.0	100
SAC45	50.00	45.0	1	6.8	77.0	50	150	1.0	200
SAC50	55.50	50.0	1	5.8	88.0	50	150	1.0	200

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P6KE6.8A	P6KE6.8CA	6.45	7.14	10	5.80	1000	58.1	10.5
P6KE7.5A	P6KE7.5CA	7.13	7.88	10	6.40	500	54.0	11.3
P6KE8.2A	P6KE8.2CA	7.79	8.61	10	7.02	200	50.4	12.1
P6KE9.1A	P6KE9.1CA	8.65	9.55	1	7.78	50	45.5	13.4
P6KE10A	P6KE10CA	9.50	10.50	1	8.55	10	42.1	14.5
P6KE11A	P6KE11CA	10.50	11.60	1	9.40	5	39.1	15.6
P6KE12A	P6KE12CA	11.40	12.60	1	10.20	5	36.5	16.7
P6KE13A	P6KE13CA	12.40	13.70	1	11.10	1	33.5	18.2
P6KE15A	P6KE15CA	14.30	15.80	1	12.80	1	28.8	21.2
P6KE16A	P6KE16CA	15.20	16.80	1	13.60	1	27.1	22.5
P6KE18A	P6KE18CA	17.10	18.90	1	15.30	1	24.2	25.2
P6KE20A	P6KE20CA	19.00	21.00	1	17.10	1	22.0	27.7
P6KE22A	P6KE22CA	20.90	23.10	1	18.80	1	19.9	30.6
P6KE24A	P6KE24CA	22.80	25.20	1	20.50	1	18.4	33.2
P6KE27A	P6KE27CA	25.70	28.40	1	23.10	1	16.3	37.5
P6KE30A	P6KE30CA	28.50	31.50	1	25.60	1	14.7	41.4
P6KE33A	P6KE33CA	31.40	34.70	1	28.20	1	13.3	45.7
P6KE36A	P6KE36CA	34.20	37.80	1	30.80	1	12.2	49.9
P6KE39A	P6KE39CA	37.10	41.00	1	33.30	1	11.3	53.9
P6KE43A	P6KE43CA	40.90	45.20	1	36.80	1	10.3	59.3
P6KE47A	P6KE47CA	44.70	49.40	1	40.20	1	9.4	64.8
P6KE51A	P6KE51CA	48.50	53.60	1	43.60	1	8.7	70.1
P6KE56A	P6KE56CA	53.20	58.80	1	47.80	1	7.9	77.0
P6KE62A	P6KE62CA	58.90	65.10	1	53.00	1	7.2	85.0
P6KE68A	P6KE68CA	64.60	71.40	1	58.10	1	6.6	92.0

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
P6KE75A	P6KE75CA	71.30	78.80	1	64.10	1	5.9	103.0
P6KE82A	P6KE82CA	77.90	86.10	1	70.10	1	5.4	113.0
P6KE91A	P6KE91CA	86.50	95.50	1	77.80	1	4.9	125.0
P6KE100A	P6KE100CA	95.00	105.00	1	85.50	1	4.5	137.0
P6KE110A	P6KE110CA	105.00	116.00	1	94.00	1	4.0	152.0
P6KE120A	P6KE120CA	114.00	126.00	1	102.00	1	3.7	165.0
P6KE130A	P6KE130CA	124.00	137.00	1	111.00	1	3.4	179.0
P6KE150A	P6KE150CA	143.00	158.00	1	128.00	1	2.9	207.0
P6KE160A	P6KE160CA	152.00	168.00	1	136.00	1	2.8	219.0
P6KE170A	P6KE170CA	162.00	179.00	1	145.00	1	2.6	234.0
P6KE180A	P6KE180CA	171.00	189.00	1	154.00	1	2.5	246.0
P6KE200A	P6KE200CA	190.00	210.00	1	171.00	1	2.2	274.0
P6KE220A	P6KE220CA	209.00	231.00	1	185.00	1	1.9	328.0
P6KE250A	-	237.00	263.00	1	214.00	1	1.8	344.0
-	P6KE250CA*	237.00	263.00	1	214.00	1	2.4	344.0
P6KE300A	-	285.00	315.00	1	256.00	1	1.5	414.0
-	P6KE300CA*	285.00	315.00	1	256.00	1	2.0	414.0
P6KE350A*	P6KE350CA*	332.00	368.00	1	300.00	1	1.7	482.0
P6KE400A*	P6KE400CA*	380.00	420.00	1	342.00	1	1.5	548.0
P6KE440A*	P6KE440CA*	418.00	462.00	1	376.00	1	1.4	602.0
P6KE480A*	P6KE480CA*	456.00	504.00	1	408.00	1	1.3	658.0
P6KE510A*	P6KE510CA*	485.00	535.00	1	434.00	1	1.2	698.0
P6KE530A*	P6KE530CA*	503.50	556.50	1	451.00	1	1.2	725.0
P6KE540A*	P6KE540CA*	513.00	567.00	1	460.00	1	1.1	740.0
P6KE550A*	P6KE550CA*	522.50	577.50	1	468.00	1	1.1	760.0
P6KE600A*	P6KE600CA*	570.00	630.00	1	512.00	1	1.0	828.0

Notes:
1. Measured of 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
2. V_F < 3.5 V for single die parts and V_F < 5.0 V for stacked-die parts.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.
4.For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.

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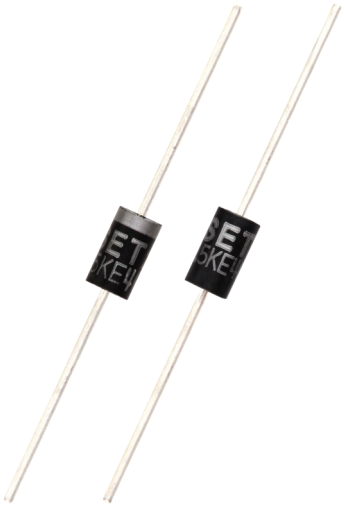
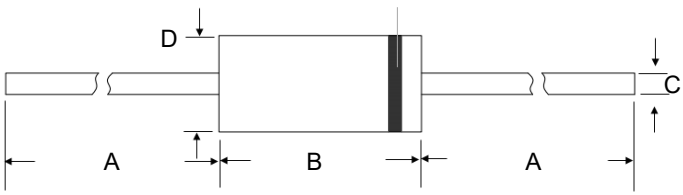


Package Outline Dimensions (DO-201)

Cathode Band (for uni-directional products only)



DO - 201

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	7.20	9.50	0.285	0.375
C	0.96	1.07	0.038	0.042
D	4.80	5.30	0.190	0.210

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
1.5KE6.8A	1.5KE6.8CA	6.45	7.14	10	5.80	1000	144.8	10.5
1.5KE7.5A	1.5KE7.5CA	7.13	7.88	10	6.40	500	134.5	11.3
1.5KE8.2A	1.5KE8.2CA	7.79	8.61	10	7.02	200	125.6	12.1
1.5KE9.1A	1.5KE9.1CA	8.65	9.50	1	7.78	50	113.4	13.4
1.5KE10A	1.5KE10CA	9.50	10.50	1	8.55	10	104.8	14.5
1.5KE11A	1.5KE11CA	10.50	11.60	1	9.40	5	97.4	15.6
1.5KE12A	1.5KE12CA	11.40	12.60	1	10.20	5	91.0	16.7
1.5KE13A	1.5KE13CA	12.40	13.70	1	11.10	1	83.5	18.2
1.5KE15A	1.5KE15CA	14.30	15.80	1	12.80	1	71.7	21.2
1.5KE16A	1.5KE16CA	15.20	16.80	1	13.60	1	67.6	22.5
1.5KE18A	1.5KE18CA	17.10	18.90	1	15.30	1	60.3	25.2
1.5KE20A	1.5KE20CA	19.00	21.00	1	17.10	1	54.9	27.7
1.5KE22A	1.5KE22CA	20.90	23.10	1	18.80	1	49.7	30.6
1.5KE24A	1.5KE24CA	22.80	25.20	1	20.50	1	45.8	33.2
1.5KE27A	1.5KE27CA	25.70	28.40	1	23.10	1	40.5	37.5
1.5KE30A	1.5KE30CA	28.50	31.50	1	25.60	1	36.7	41.4
1.5KE33A	1.5KE33CA	31.40	34.70	1	28.20	1	33.3	45.7
1.5KE36A	1.5KE36CA	34.20	37.80	1	30.80	1	30.5	49.9
1.5KE39A	1.5KE39CA	37.10	41.00	1	33.30	1	28.2	53.9
1.5KE43A	1.5KE43CA	40.90	45.20	1	36.80	1	25.6	59.3
1.5KE47A	1.5KE47CA	44.70	49.40	1	40.20	1	23.5	64.8
1.5KE51A	1.5KE51CA	48.50	53.60	1	43.60	1	21.7	70.1
1.5KE56A	1.5KE56CA	53.20	58.80	1	47.80	1	19.7	77.0
1.5KE62A	1.5KE62CA	58.90	65.10	1	53.00	1	17.9	85.0
1.5KE68A	1.5KE68CA	64.60	71.40	1	58.10	1	16.5	92.0

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
1.5KE75A	1.5KE75CA	71.30	78.80	1	64.10	1	14.8	103.0
1.5KE82A	1.5KE82CA	77.90	86.10	1	70.10	1	13.5	113.0
1.5KE91A	1.5KE91CA	86.50	95.50	1	77.80	1	12.2	125.0
1.5KE100A	1.5KE100CA	95.00	105.00	1	85.50	1	11.1	137.0
1.5KE110A	1.5KE110CA	105.00	116.00	1	94.00	1	10.0	152.0
1.5KE120A	1.5KE120CA	114.00	126.00	1	102.00	1	9.2	165.0
1.5KE130A	1.5KE130CA	124.00	137.00	1	111.00	1	8.5	179.0
1.5KE150A	1.5KE150CA	143.00	158.00	1	128.00	1	7.3	207.0
1.5KE160A	1.5KE160CA	152.00	168.00	1	136.00	1	6.9	219.0
1.5KE170A	1.5KE170CA	162.00	179.00	1	145.00	1	6.5	234.0
1.5KE180A	1.5KE180CA	171.00	189.00	1	154.00	1	6.2	246.0
1.5KE200A	1.5KE200CA	190.00	210.00	1	171.00	1	5.5	274.0
1.5KE220A	1.5KE220CA	209.00	231.00	1	185.00	1	4.6	328.0
1.5KE250A	-	237.00	263.00	1	214.00	1	4.4	344.0
-	1.5KE250CA*	237.00	263.00	1	214.00	1	5.9	344.0
1.5KE300A*	1.5KE300CA*	285.00	315.00	1	256.00	1	4.9	414.0
1.5KE320A*	1.5KE320CA*	304.00	336.00	1	273.00	1	4.6	441.0
1.5KE350A*	1.5KE350CA*	332.00	368.00	1	300.00	1	4.2	482.0
1.5KE400A*	1.5KE400CA*	380.00	420.00	1	342.00	1	3.7	548.0
1.5KE440A*	1.5KE440CA*	418.00	462.00	1	376.00	1	3.1	602.0
1.5KE480A*	1.5KE480CA*	456.00	504.00	1	408.00	1	3.1	658.0
1.5KE510A*	1.5KE510CA*	485.00	535.00	1	434.00	1	2.9	698.0
1.5KE530A*	1.5KE530CA*	503.50	556.50	1	451.00	1	2.8	725.0
1.5KE540A*	1.5KE540CA*	513.00	567.00	1	460.00	1	2.8	740.0
1.5KE550A*	1.5KE550CA*	522.50	577.50	1	468.00	1	2.7	760.0
1.5KE600A*	1.5KE600CA*	570.00	630.00	1	512.00	1	2.5	828.0

Notes:
1. Measured of 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
2. V_F < 3.5 V for single die parts and V_F < 5.0 V for stacked-die parts.
3. For stacked die component details, please refer to models marked with * in electrical characteristics table.
4.For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.

TVS

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Part Number	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$	Max. Junction Capacitance @0 Volts	Working Inverse Blocking Voltage V_{WIB}	Inverse Blocking Leakage Current at I_{IB} @ V_{WIB}	Peak Inverse Blocking Voltage V_{PIB}
	Min	Max									
Uni	(V)		(mA)	(V)	(μA)	(A)	(V)	(pF)	(V)	(mA)	(V)
LCE6.5A	7.22	7.98	10	6.5	1000	100.0	11.2	100	75	1.0	100
LCE7.0A	7.78	8.60	10	7.0	500	100.0	12.0	100	75	1.0	100
LCE7.5A	8.33	9.21	10	7.5	250	100.0	12.9	100	75	1.0	100
LCE8.0A	8.89	9.83	1	8.0	100	100.0	13.6	100	75	1.0	100
LCE8.5A	9.44	10.40	1	8.5	50	100.0	14.4	100	75	1.0	100
LCE9.0A	10.00	11.10	1	9.0	10	97.0	15.4	100	75	1.0	100
LCE10A	11.10	12.30	1	10.0	5	88.0	17.0	100	75	1.0	100
LCE11A	12.20	13.50	1	11.0	1	82.0	18.2	100	75	1.0	100
LCE12A	13.30	14.70	1	12.0	1	75.0	19.9	100	75	1.0	100
LCE13A	14.40	15.90	1	13.0	1	70.0	21.5	100	75	1.0	100
LCE14A	15.60	17.20	1	14.0	1	65.0	23.2	100	75	1.0	100
LCE15A	16.70	18.50	1	15.0	1	61.0	24.4	100	75	1.0	100
LCE16A	17.80	19.70	1	16.0	1	57.0	26.0	100	75	1.0	100
LCE17A	18.90	20.90	1	17.0	1	54.0	27.6	100	75	1.0	100
LCE18A	20.00	22.10	1	18.0	1	51.0	29.2	100	75	1.0	100
LCE20A	22.20	24.50	1	20.0	1	46.0	32.4	100	75	1.0	100
LCE22A	24.40	26.90	1	22.0	1	42.0	35.5	100	75	1.0	100
LCE24A	26.70	29.50	1	24.0	1	39.0	38.9	100	75	1.0	100
LCE26A	28.90	31.90	1	26.0	1	36.0	42.1	100	75	1.0	100
LCE28A	31.10	34.40	1	28.0	1	33.0	45.5	100	75	1.0	100
LCE30A	33.30	36.80	1	30.0	1	31.0	48.4	100	75	1.0	100
LCE33A	36.70	40.60	1	33.0	1	28.1	53.3	100	75	1.0	100

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TVS Diodes

Transient Voltage Suppression Diodes

LCE (DO - 201)

Model	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_{WM}	Max. Reverse Leakage $I_R@V_{WM}$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$	Max. Junction Capacitance @0 Volts	Working Inverse Blocking Voltage V_{WIB}	Inverse Blocking Leakage Current at I_{IB} @ V_{WIB}	Peak Inverse Blocking Voltage V_{PIB}
	Min	Max									
Uni	(V)		(mA)	(V)	(μA)	(A)	(V)	(pF)	(V)	(mA)	(V)
LCE36A	40.00	44.20	1	36.0	1	25.8	58.1	100	75	1.0	100
LCE40A	44.40	49.10	1	40.0	1	23.3	64.5	100	75	1.0	100
LCE43A	47.80	52.80	1	43.0	1	21.6	69.4	100	75	1.0	100
LCE45A	50.00	55.30	1	45.0	1	20.6	72.7	100	75	1.0	100
LCE48A	53.30	58.90	1	48.0	1	19.4	77.4	100	75	1.0	100
LCE51A	56.70	62.70	1	51.0	1	18.2	82.4	100	75	1.0	100
LCE54A	60.00	66.30	1	54.0	1	17.2	87.1	100	100	1.0	125
LCE58A	64.40	71.20	1	58.0	1	16.0	93.6	100	100	1.0	125
LCE60A	66.70	73.70	1	60.0	1	15.5	96.8	100	100	1.0	125
LCE64A	71.10	78.60	1	64.0	1	14.6	103.0	100	100	1.0	125
LCE70A	77.80	86.00	1	70.0	1	13.3	113.0	100	125	1.0	150
LCE75A	83.30	92.10	1	75.0	1	12.4	121.0	100	125	1.0	150
LCE85A	94.40	104.00	1	85.0	1	11.6	129.0	100	125	1.0	150
LCE90A	100.00	111.00	1	90.0	1	10.3	146.0	100	125	1.0	150

Note:

1. For parts without A in the PN, the V_{BR} tolerance is ± 10% and V_C is 5% higher than parts with A. The parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

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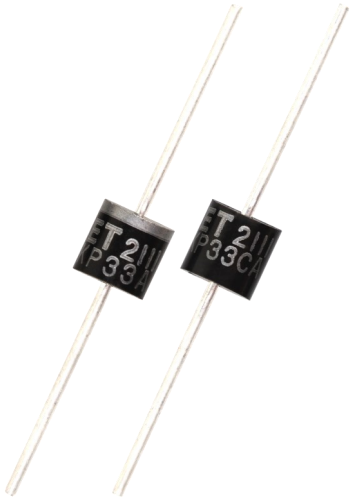
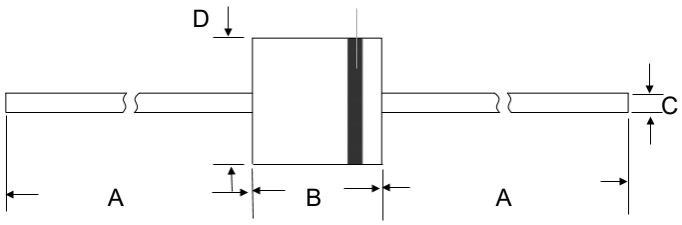


Package Outline Dimensions (P600)

Cathode Band (for uni-directional products only)



P600

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	8.60	9.10	0.340	0.360
C	1.22	1.36	0.048	0.054
D	8.60	9.10	0.340	0.360

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
5KP5.0A	5KP5.0CA	6.40	7.00	50	5.00	5000	554.3	9.2
5KP6.0A	5KP6.0CA	6.67	7.37	50	6.00	5000	495.1	10.3
5KP6.5A	5KP6.5CA	7.22	7.98	50	6.50	2000	455.4	11.2
5KP7.0A	5KP7.0CA	7.78	8.60	50	7.00	1000	425.0	12.0
5KP7.5A	5KP7.5CA	8.33	9.21	5	7.50	250	395.3	12.9
5KP8.0A	5KP8.0CA	8.89	9.83	5	8.00	150	375.0	13.6
5KP8.5A	5KP8.5CA	9.44	10.40	5	8.50	50	354.2	14.4
5KP9.0A	5KP9.0CA	10.00	11.10	5	9.00	20	331.2	15.4
5KP10A	5KP10CA	11.10	12.30	5	10.00	15	300.0	17.0
5KP11A	5KP11CA	12.20	13.50	5	11.00	2	280.2	18.2
5KP12A	5KP12CA	13.30	14.70	5	12.00	2	256.3	19.9
5KP13A	5KP13CA	14.40	15.90	5	13.00	2	237.2	21.5
5KP14A	5KP14CA	15.60	17.20	5	14.00	2	219.8	23.2
5KP15A	5KP15CA	16.70	18.50	5	15.00	2	209.0	24.4
5KP16A	5KP16CA	17.80	19.70	5	16.00	2	196.2	26.0
5KP17A	5KP17CA	18.90	20.90	5	17.00	2	184.8	27.6
5KP18A	5KP18CA	20.00	22.10	5	18.00	2	174.7	29.2
5KP20A	5KP20CA	22.20	24.50	5	20.00	2	157.4	32.4
5KP22A	5KP22CA	24.00	26.90	5	22.00	2	143.7	35.5
5KP24A	5KP24CA	26.70	29.50	5	24.00	2	131.1	38.9
5KP26A	5KP26CA	28.90	31.90	5	26.00	2	121.1	42.1
5KP28A	5KP28CA	31.10	34.40	5	28.00	2	112.3	45.4
5KP30A	5KP30CA	33.30	36.80	5	30.00	2	105.4	48.4
5KP33A	5KP33CA	36.70	40.60	5	33.00	2	95.7	53.3
5KP36A	5KP36CA	40.00	44.20	5	36.00	2	87.8	58.1

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
5KP40A	5KP40CA	44.40	49.10	5	40.00	2	79.1	64.5
5KP43A	5KP43CA	47.80	52.80	5	43.00	2	73.5	69.4
5KP45A	5KP45CA	50.00	55.30	5	45.00	2	70.2	72.7
5KP48A	5KP48CA	53.30	58.90	5	48.00	2	65.9	77.4
5KP51A	5KP51CA	56.70	62.70	5	51.00	2	61.9	82.4
5KP54A	5KP54CA	60.00	66.30	5	54.00	2	58.6	87.1
5KP58A	5KP58CA	64.40	71.20	5	58.00	2	54.5	93.6
5KP60A	5KP60CA	66.70	73.70	5	60.00	2	52.7	96.8
5KP64A	5KP64CA	71.10	78.60	5	64.00	2	49.5	103.0
5KP70A	5KP70CA	77.80	86.00	5	70.00	2	45.1	113.0
5KP75A	5KP75CA	83.30	92.10	5	75.00	2	42.1	121.0
5KP78A	5KP78CA	86.70	95.80	5	78.00	2	40.5	126.0
5KP85A	5KP85CA	94.40	104.00	5	85.00	2	37.2	137.0
5KP90A	5KP90CA	100.00	111.00	5	90.00	2	34.9	146.0
5KP100A	5KP100CA	110.00	123.00	5	100.00	2	31.5	162.0
5KP110A	5KP110CA	122.00	135.00	5	110.00	2	28.8	177.0
5KP120A	5KP120CA	133.00	147.00	5	120.00	2	26.4	193.0
5KP130A	5KP130CA	144.00	159.00	5	130.00	2	24.4	209.0
5KP150A	5KP150CA	167.00	185.00	5	150.00	2	21.0	243.0
5KP160A	5KP160CA	178.00	197.00	5	160.00	2	19.7	259.0
5KP170A	5KP170CA	189.00	209.00	5	170.00	2	18.5	275.0
5KP180A	5KP180CA	200.00	221.00	5	180.00	2	17.5	292.0
5KP190A	5KP190CA	211.00	233.00	5	190.00	2	16.5	310.0
5KP200A	5KP200CA	222.00	246.00	5	200.00	2	15.5	329.2
5KP210A	5KP210CA	233.00	258.00	5	210.00	2	14.6	349.5
5KP220A	5KP220CA	244.00	270.00	5	220.00	2	13.7	371.1
5KP250A	5KP250CA	277.00	306.00	5	250.00	2	12.0	425.0

Notes:
1. Measured of 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
2. V_F < 3.5 V for single die parts and V_F < 5.0 V for stacked-die parts.
3.For bidirectional type having V_R of 10 volts and less, the I_R should be doubled.

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
15KPA17A	15KPA17CA	18.99	20.79	50	17	5000	515.4	29.3
15KPA18A	15KPA18CA	20.11	22.01	50	18	5000	488.7	30.9
15KPA20A	15KPA20CA	22.34	24.46	20	20	1500	440.2	34.3
15KPA22A	15KPA22CA	24.57	26.91	10	22	500	407.0	37.1
15KPA24A	15KPA24CA	26.81	29.35	5	24	150	371.0	40.7
15KPA26A	15KPA26CA	29.04	31.80	5	26	50	343.2	44.0
15KPA28A	15KPA28CA	31.28	34.24	5	28	25	317.9	47.5
15KPA30A	15KPA30CA	33.51	36.70	5	30	15	297.8	50.7
15KPA33A	15KPA33CA	36.90	40.40	5	33	2	276.1	54.7
15KPA36A	15KPA36CA	40.20	44.00	5	36	2	252.5	59.8
15KPA40A	15KPA40CA	44.70	48.90	5	40	2	229.5	65.8
15KPA43A	15KPA43CA	48.00	52.60	5	43	2	216.3	69.8
15KPA45A	15KPA45CA	50.30	55.00	5	45	2	207.4	72.8
15KPA48A	15KPA48CA	53.60	58.70	5	48	2	194.3	77.7
15KPA51A	15KPA51CA	57.00	62.40	5	51	2	182.1	82.9
15KPA54A	15KPA54CA	60.30	66.00	5	54	2	172.2	87.7
15KPA58A	15KPA58CA	64.80	70.90	5	58	2	161.0	93.8
15KPA60A	15KPA60CA	67.00	73.40	5	60	2	155.0	97.4
15KPA64A	15KPA64CA	71.50	78.30	5	64	2	144.9	104.2
15KPA70A	15KPA70CA	78.20	85.60	5	70	2	132.9	113.6
15KPA75A	15KPA75CA	83.80	91.70	5	75	2	123.8	122.0
15KPA78A	15KPA78CA	87.10	95.40	5	78	2	119.7	126.1
15KPA85A	15KPA85CA	94.90	104.00	5	85	2	109.7	137.6
15KPA90A	15KPA90CA	100.50	110.10	5	90	2	103.7	145.6
15KPA100A	15KPA100CA	111.70	122.30	5	100	2	93.6	161.3

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
15KPA110A	15KPA110CA	122.90	134.50	5	110	2	84.5	178.6
15KPA120A	15KPA120CA	134.00	146.80	5	120	2	78.5	192.3
15KPA130A	15KPA130CA	145.20	159.00	5	130	2	72.5	208.3
15KPA150A	15KPA150CA	167.60	183.50	5	150	2	62.4	241.9
15KPA160A	15KPA160CA	178.70	195.70	5	160	2	58.4	258.6
15KPA170A	15KPA170CA	189.90	207.90	5	170	2	55.4	272.7
15KPA180A	15KPA180CA	201.10	220.10	5	180	2	52.3	288.5
15KPA200A	15KPA200CA	223.40	244.60	5	200	2	47.3	319.1
15KPA220A	15KPA220CA	245.70	269.10	5	220	2	42.4	356.0
15KPA240A	15KPA240CA	268.10	293.50	5	240	2	39.3	384.6
15KPA260A	15KPA260CA	290.40	318.00	5	260	2	36.2	416.7
15KPA280A	15KPA280CA	312.80	342.40	5	280	2	33.2	454.5

Notes:
1. Measured of 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
2. V_F < 3.5 V for single die parts and V_F < 5.0 V for stacked-die parts.
3.For bidirectional type having V_R of 30 volts and less, the I_R should be doubled.

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
20KPA20A	20KPA20CA	22.34	24.57	50	20	5000	548.9	36.8
20KPA24A	20KPA24CA	26.81	29.49	50	24	5000	490.3	41.2
20KPA26A	20KPA26CA	29.04	31.94	50	26	2000	451.9	44.7
20KPA28A	20KPA28CA	31.28	34.41	50	28	1000	420.8	48.0
20KPA30A	20KPA30CA	33.51	36.86	5	30	250	392.2	51.5
20KPA32A	20KPA32CA	35.74	39.31	5	32	150	372.0	54.3
20KPA34A	20KPA34CA	38.00	41.80	5	34	50	351.3	57.5
20KPA36A	20KPA36CA	40.20	44.22	5	36	20	328.5	61.5
20KPA40A	20KPA40CA	44.70	49.17	5	40	15	297.9	67.8
20KPA44A	20KPA44CA	49.10	54.01	5	44	2	277.9	72.7
20KPA48A	20KPA48CA	53.60	58.96	5	48	2	254.4	79.4
20KPA52A	20KPA52CA	58.10	63.91	5	52	2	235.4	85.8
20KPA56A	20KPA56CA	62.60	68.86	5	56	2	218.1	92.6
20KPA60A	20KPA60CA	67.00	73.70	5	60	2	207.0	97.6
20KPA64A	20KPA64CA	71.50	78.65	5	64	2	194.2	104.0
20KPA68A	20KPA68CA	76.00	83.60	5	68	2	183.6	110.0
20KPA72A	20KPA72CA	80.40	88.44	5	72	2	174.1	116.0
20KPA80A	20KPA80CA	89.40	98.34	5	80	2	155.4	130.0
20KPA88A	20KPA88CA	98.30	108.13	5	88	2	142.3	142.0
20KPA96A	20KPA96CA	107.20	117.92	5	96.00	2	130.3	155.0
20KPA104A	20KPA104CA	116.20	127.82	5	104.00	2	120.2	168.0
20KPA112A	20KPA112CA	125.10	137.61	5	112.00	2	111.0	182.0
20KPA120A	20KPA120CA	134.00	147.40	5	120.00	2	104.1	194.0
20KPA132A	20KPA132CA	147.40	162.14	5	132.00	2	94.8	213.0
20KPA144A	20KPA144CA	160.80	176.88	5	144.00	2	87.1	232.0

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
20KPA160A	20KPA160CA	178.70	196.57	5	160.00	2	78.3	258.0
20KPA172A	20KPA172CA	192.10	211.31	5	172.00	2	72.9	277.0
20KPA180A	20KPA180CA	201.10	221.21	5	180.00	2	69.4	291.0
20KPA192A	20KPA192CA	214.50	235.95	5	192.00	2	65.4	309.0
20KPA204A	20KPA204CA	227.90	250.69	5	204.00	2	61.4	329.0
20KPA216A	20KPA216CA	241.30	265.43	5	216.00	2	58.0	348.0
20KPA232A	20KPA232CA	259.10	285.01	5	232.00	2	54.0	374.0
20KPA240A	20KPA240CA	268.10	294.91	5	240.00	2	52.2	387.0
20KPA256A	20KPA256CA	286.00	314.60	5	256.00	2	49.0	412.0
20KPA280A	20KPA280CA	312.80	344.08	5	280.00	2	44.8	451.0
20KPA300A	20KPA300CA	335.10	368.61	5	300.00	2	41.8	483.0

Notes:
1. Measured of 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
2. V_F < 3.5 V for single die parts and V_F < 5.0 V for stacked-die parts.
3.For bidirectional type having V_R of 40 volts and less, the I_R should be doubled.

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model		Breakdown Voltage V_{BR}@I_T		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_R	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage V_C@I_{PPM}
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
30KPA28A	30KPA28CA	31.28	34.41	50	28	5000	606.0	50.0
30KPA30A	30KPA30CA	33.51	36.86	50	30	5000	548.9	55.2
30KPA33A	30KPA33CA	36.90	40.59	50	33	5000	517.9	58.5
30KPA36A	30KPA36CA	40.20	44.22	50	36	5000	490.3	61.8
30KPA39A	30KPA39CA	43.60	47.96	20	39	2000	450.9	67.2
30KPA42A	30KPA42CA	46.90	51.59	10	42	1000	420.8	72.0
30KPA43A	30KPA43CA	48.00	52.80	10	43	1000	415.1	73.0
30KPA45A	30KPA45CA	50.30	55.33	5	45	250	391.5	77.4
30KPA48A	30KPA48CA	53.60	58.96	5	48	150	371.3	81.6
30KPA51A	30KPA51CA	57.00	62.70	5	51	50	350.7	86.4
30KPA54A	30KPA54CA	60.30	66.33	5	54	20	331.5	91.4
30KPA58A	30KPA58CA	64.80	71.28	5	58	20	327.9	92.4
30KPA60A	30KPA60CA	67.00	73.70	5	60	15	297.1	102.0
30KPA64A	30KPA64CA	71.50	78.65	5	64	10	291.3	104.0
30KPA66A	30KPA66CA	73.70	81.07	5	66	2	283.2	107.0
30KPA70A	30KPA70CA	78.20	86.02	5	70	2	278.0	109.0
30KPA71A	30KPA71CA	79.30	87.23	5	71	2	271.7	111.5
30KPA72A	30KPA72CA	80.40	88.44	5	72	2	265.8	114.0
30KPA75A	30KPA75CA	83.80	92.18	5	75	2	253.8	119.4
30KPA78A	30KPA78CA	87.10	95.81	5	78	2	234.9	129.0
30KPA84A	30KPA84CA	93.80	103.18	5	84	2	217.7	139.2
30KPA90A	30KPA90CA	100.50	110.55	5	90	2	207.0	146.4
30KPA96A	30KPA96CA	107.20	117.92	5	96	2	194.2	156.0
30KPA102A	30KPA102CA	113.90	125.29	5	102	2	183.0	165.6
30KPA108A	30KPA108CA	120.60	132.66	5	108	2	172.9	175.2

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Model		Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Reverse Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Max. Peak Pulse Current I_{PPM}	Max. Clamping Voltage $V_C@I_{PPM}$
		Min	Max					
Uni	Bi	(V)		(mA)	(V)	(μA)	(A)	(V)
30KPA120A	30KPA120CA	134.00	147.40	5	120	2	155.9	194.4
30KPA132A	30KPA132CA	147.40	162.14	5	132	2	142.3	213.0
30KPA144A	30KPA144CA	160.80	176.88	5	144	2	135.8	223.2
30KPA150A	30KPA150CA	167.60	184.36	5	150	2	129.8	233.4
30KPA156A	30KPA156CA	174.30	191.73	5	156	2	123.7	245.0
30KPA160A	30KPA160CA	178.70	196.57	5	160	2	120.0	252.6
30KPA168A	30KPA168CA	187.70	206.47	5	168	2	111.2	272.4
30KPA170A	30KPA170CA	189.90	208.89	5	170	2	110.2	275.0
30KPA180A	30KPA180CA	201.10	221.21	5	180	2	104.3	290.4
30KPA198A	30KPA198CA	221.20	243.32	5	198	2	94.7	319.8
30KPA216A	30KPA216CA	241.30	265.43	5	216	2	86.9	348.6
30KPA240A	30KPA240CA	268.10	294.91	5	240	2	78.3	387.0
30KPA258A	30KPA258CA	288.20	317.02	5	258	2	72.8	416.4
30KPA260A	30KPA260CA	290.40	319.44	5	260	2	72.8	416.0
30KPA270A	30KPA270CA	301.60	331.76	5	270	2	69.5	436.2
30KPA280A	30KPA280CA	312.80	344.08	5	280	2	65.3	464.0
30KPA288A	30KPA288CA	321.70	353.87	5	288	2	64.5	469.9
30KPA300A	30KPA300CA	334.00	367.40	5	300	2	62.0	484.0
30KPA320A	30KPA320CA	357.40	391.40	5	320	2	57.2	530.0
30KPA350A	30KPA350CA	391.00	428.10	5	350	2	53.4	567.0
30KPA360A	30KPA360CA	402.10	440.30	5	360	2	47.3	640.0

Notes:
1. Measured of 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
2. V_F < 3.5 V for single die parts and V_F < 5.0 V for stacked-die parts.
3.For bidirectional type having V_R of 60 volts and less, the I_R should be doubled.

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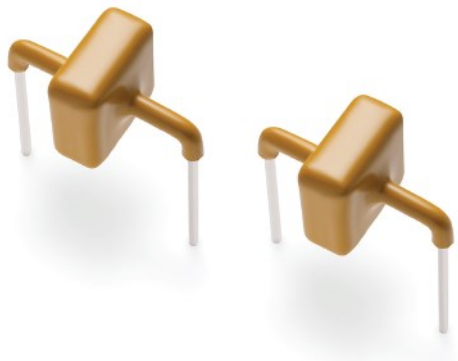
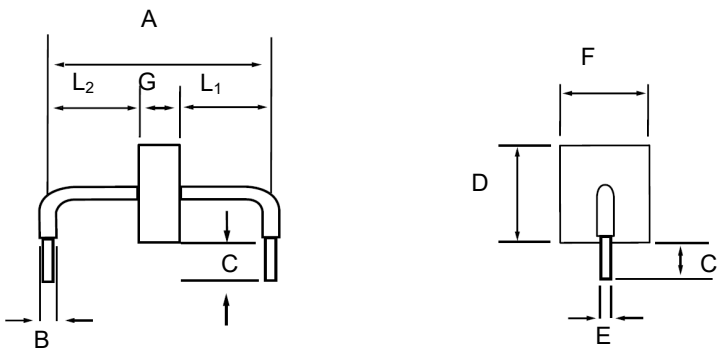


Package Outline Dimensions



Symbol	Millimeters	Inches
A	24.15 ± 1.00	0.950 ± 0.040
B	2.50 ± 0.70	0.100 ± 0.028
C	6.00 ± 1.00	0.236 ± 0.039
D	14.48 max.	0.570 max.
E	1.28 ± 0.05	0.051 ± 0.002
F	12.70 max.	0.500 max.
G	2.44 ± 1.00	0.096 ± 0.040
L_1 / L_2	L_1 = L_2 Tolerance ± 1.0 mm (0.04 inch)	

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model	Device Marking Code	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Typical Leakage I_R @85°C	Max. Clamping Voltage V_{CL} @ I_{pp} Peak Pulse Current (I_{PP}) (Note 1)		Max. Temp Coefficient OF V_{BR}	Max. Capacitance 0 Bias 10kHz
		Min	Max								
		(V)		(mA)	(V)	(μA)	(μA)	I_{PP} (A)	V_{CL} (V)	(%/°C)	(nF)
SPCL1 - 076C	1-076C	85	95	10	76	10	15	1000	140	0.1	8.5

Note :
1. Using 8/20 μS wave shape as defined in IEC 61000 -4-5.

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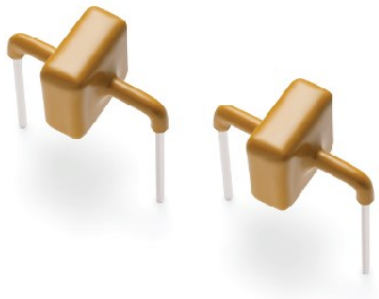
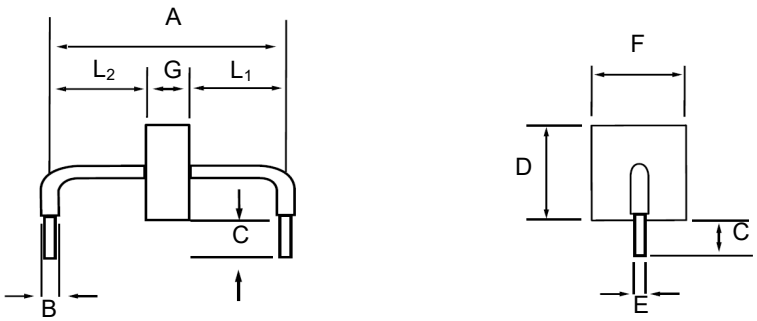


Package Outline Dimensions



Symbol		Millimeters	Inches
A		24.15 ± 1.00	0.951 ± 0.040
B		2.50 ± 0.70	0.100 ± 0.028
C		6.00 ± 1.00	0.236 ± 0.039
	-208C	3.68 ± 1.00	0.145 ± 0.040
D		11.00 max.	0.433 max.
E		1.28 ± 0.05	0.051 ± 0.002
F		9.50 max.	0.374 max.
G	-015C/ -025C	2.36 ± 1.00	0.093 ± 0.039
	-030C / -038C / -066C	3.30 ± 1.20	0.130 ± 0.047
	-058C / -076C	4.27 ± 1.20	0.168 ± 0.047
	-150C	9.72 ± 1.20	0.383 ± 0.047
	-170C / -190C	10.67 ± 1.20	0.420 ± 0.047
	-208C	9.10 ± 1.20	0.358 ± 0.047
	-300C	11.80 ± 1.20	0.465± 0.047
	-380C	13.90 ± 1.20	0.547 ± 0.047
	-430C	14.80 ± 1.20	0.583 ± 0.047
L_1 / L_2		$L_1 = L_2$ Tolerance ± 1.20 mm (0.047 inch)	

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model	Device Marking Code	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Typical Leakage I_R @85°C	Max. Clamping Voltage V_{CL} @ I_{pp} Peak Pulse Current (I_{PP}) (Note 1)		Max. Temp Coefficient OF V_{BR}	Max. Capacitance 0 Bias 10kHz
		Min	Max								
		(V)		(mA)	(V)	(μA)	(μA)	I_{PP}(A)	V_{CL}(V)	(%/°C)	(nF)
SPCL3 - 015C	3 - 015C	16	19	10	15	10	15	3000	28	0.1	12.0
SPCL3 - 025C	3 - 025C	28	31	10	25	10	15	3000	50	0.1	11.0
SPCL3 - 030C	3 - 030C	32	37	10	30	10	15	3000	58	0.1	11.0
SPCL3 - 038C	3 - 038C	40	46	10	38	10	15	3000	95	0.1	10.0
SPCL3 - 058C	3 - 058C	64	70	10	58	10	15	3000	110	0.1	6.0
SPCL3 - 066C	3 - 066C	72	80	10	66	10	15	3000	120	0.1	6.0
SPCL3 - 076C	3 - 076C	85	95	10	76	10	15	3000	140	0.1	6.0
SPCL3 - 150C	3 - 150C	158	194	10	150	10	15	3000	230	0.1	2.6
SPCL3 - 170C	3 - 170C	179	220	10	170	10	15	3000	260	0.1	2.4
SPCL3 - 190C	3 - 190C	200	245	10	190	10	15	3000	290	0.1	2.4
SPCL3 - 208C	3 - 208C	223	246	10	208	10	15	3000	306	0.1	2.4
SPCL3 - 300C	3 - 300C	330	366	10	300	10	15	3000	470	0.1	2.4
SPCL3 - 380C	3 - 380C	401	443	10	380	10	15	3000	520	0.1	2.0
SPCL3 - 430C	3 - 430C	440	490	10	430	10	15	3000	625	0.1	2.0

Note:
1. Using 8/20 μS wave shape as defined in IEC 61000-4-5.

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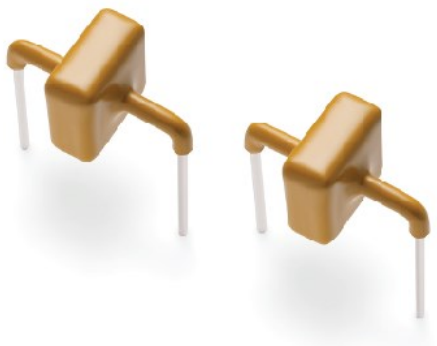
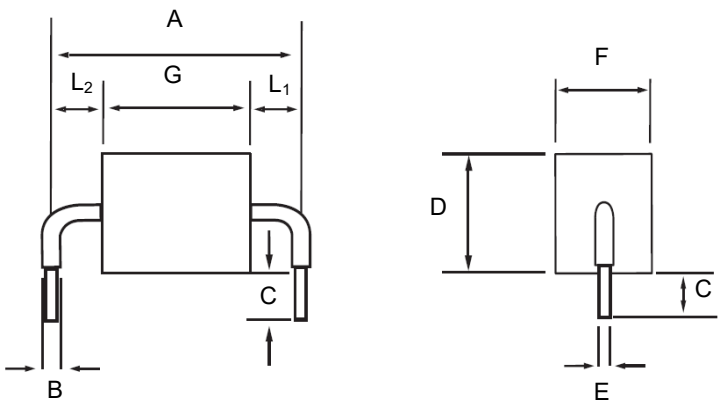


Package Outline Dimensions



Symbol	Millimeters	Inches
A	24.15 ± 1.00	0.951 ± 0.040
B	2.50 ± 0.70	0.100 ± 0.028
C	6.00 ± 1.00	0.236 ± 0.040
D	14.48 max.	0.570 max.
E	1.28 ± 0.05	0.051 ± 0.002
F	12.70 max.	0.500 max.
G - 030C / -038C	4.10 ± 1.00	0.161 ± 0.040
G - 058C / -066C / -076C	4.80 ± 1.00	0.189 ± 0.040
G - 170C / 190C	8.13 ± 1.00	0.320 ± 0.040
G - 240C	9.40 ± 1.00	0.370 ± 0.040
G - 380C-Y / 430C	13.8 0± 1.00	0.543 ± 0.040
L_1 / L_2	$L_1 = L_2$ Tolerance ± 1.0 mm (± 0.04 inch)	

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model	Device Marking Code	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Stand-off Voltage V_R	Max. Reverse Leakage $I_R@V_R$	Typical Leakage I_R @85°C	Max. Clamping Voltage VCL @ Ipp Peak Pulse Current (I_{PP}) (Note 1)		Max. Temp Coefficient OF V_{BR}	Max. Capacitance 0 Bias 10kHz
		Min	Max								
		(V)		(mA)	(V)	(μA)	(μA)	I_{PP}(A)	V_{CL}(V)	(%/°C)	(nF)
SPCL6-030C	6-030C	32	37	10	30	10	15	6000	58	0.1	11.0
SPCL6-038C	6-038C	42.6	47.6	10	38	10	15	6000	73.4	0.1	11.0
SPCL6-058C	6-058C	64	70	10	58	10	15	6000	110	0.1	8.0
SPCL6-066C	6-066C	72	80	10	66	10	15	6000	120	0.1	6.0
SPCL6-076C	6-076C	85	95	10	76	10	15	6000	140	0.1	6.5
SPCL6-170C	6-170C	180	220	10	170	10	15	6000	260	0.1	2.8
SPCL6-190C	6-190C	200	245	10	190	10	15	6000	290	0.1	2.5
SPCL6-240C	6-240C	250	285	10	240	10	15	6000	340	0.1	2.0
SPCL6-380C	6-380C	401	443	10	380	10	15	6000	520	0.1	1.4
SPCL6-430C	6-430C	440	490	10	430	10	15	6000	625	0.1	1.0

Note:
1. Using 8/20 μS wave shape as defined in IEC 61000 -4-5.

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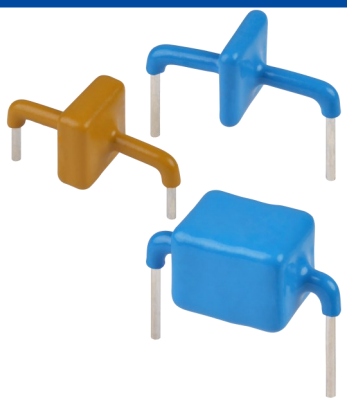
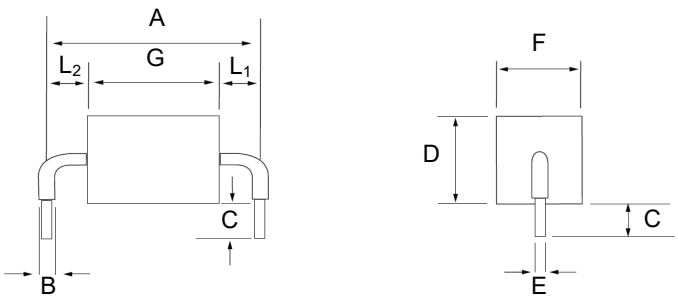


Package Outline Dimensions



Symbol	Millimeters	Inches
A	24.15 ± 1.00	0.950 ± 0.040
A - 530C	34.70 ± 2.00	1.370 ± 0.080
A - 530C-24	24.15 ± 1.00	0.950 ± 0.040
B	2.50 ± 0.70	0.100 ± 0.028
C	6.00 ± 1.00	0.236 ± 0.040
D	14.48 max.	0.570 max.
E	1.28 ± 0.05	0.051 ± 0.002
F	12.70 max.	0.500 max.
G - 015C	3.60 ± 1.00	0.142 ± 0.040
G - 030C / - 033C/ - 045C	4.23 ± 1.00	0.167 ± 0.040
G - 058C / -066C / - 076C	5.08 ± 1.00	0.200 ± 0.040
G - 076C - F	5.88 ± 1.00	0.232 ± 0.040
G - 170C / - 190C	9.20 ± 1.00	0.362 ± 0.040
G - 240C	10.67 ± 1.00	0.420 ± 0.040
G - 380C / - 430C	14.50 ± 1.20	0.571 ± 0.047
G - 530C	27.00 ± 1.50	1.060 ± 0.060
G - 530C-24	17.50 ± 1.50	0.689 ± 0.060
L_1 / L_2	$L_1 = L_2$ Tolerance ± 1.0 mm(0 .04 inch)	

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model	Device Marking Code	Breakdown Voltage V_{BR}@I_T		Test Current I_T	Stand-off Voltage V_R	Max Reverse Leakage I_R@V_R	Typical Leakage I_R @85°C	Max. Clamping Voltage VCL @ Ipp Peak Pulse Current (I_{PP}) (Note 1)		Max. Temp Coefficient OF V_{BR}	Max. Capacitance 0 Bias 10kHz
		Min	Max								
		(V)		(mA)	(V)	(μA)	(μA)	I_{PP}(A)	V_{CL}(V)	(% / °C)	(nF)
SPCL10-015C	10-015C	16	19	10	15	10	15	10000	28	0.1	40.0
SPCL10-030C	10-030C	32	37	10	30	10	15	10000	58	0.1	20.0
SPCL10-033C	10-033C	36	40	10	33	10	15	10000	53	0.1	20.0
SPCL10-045C	10-045C	48	55	10	45	10	15	10000	80	0.1	20.0
SPCL10-058C	10-058C	64	70	10	58	10	15	10000	110	0.1	10.0
SPCL10-066C	10-066C	72	80	10	66	10	15	10000	120	0.1	10.0
SPCL10-076C	10-076C	85	95	10	76	10	15	10000	140	0.1	6.5
SPCL10-076C-F	10-076C-F	85	95	10	76	10	15	10000	140	0.1	6.5
SPCL10-170C	10-170C	180	220	10	170	10	15	10000	260	0.1	4.0
SPCL10-190C	10-190C	200	245	10	190	10	15	10000	290	0.1	3.0
SPCL10-240C	10-240C	250	285	10	240	10	15	10000	340	0.1	2.2
SPCL10-380C	10-380C	401	443	10	380	10	15	10000	520	0.1	2.0
SPCL10-430C	10-430C	440	490	10	430	10	15	10000	625	0.1	1.4
SPCL10-530C	10-530C	560	619	10	530	10	15	10000	750	0.1	1.0
SPCL10-530C-24	10-530C-24	560	619	10	530	10	15	10000	750	0.1	1.0

Note:
1. Using 8 / 20 μs wave shape as defined in IEC 61000-4-5.

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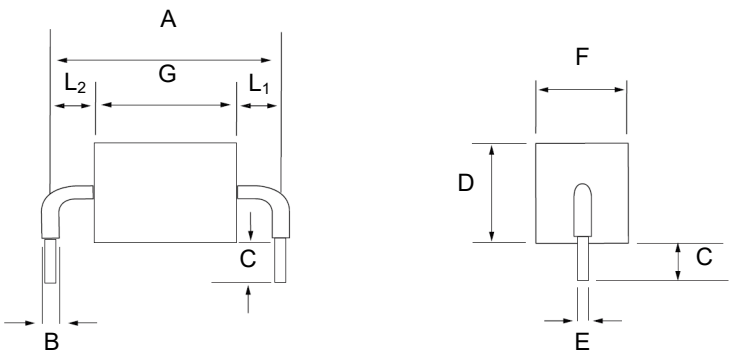
Package Outline Dimensions



Symbol	Millimeters	Inches
A	24.15 ± 0.8	0.95 ± 0.03
B	2.50 ± 0.70	0.100 ± 0.028
C	6.00 ± 1.0	0.236 ± 0.04
D	15.5 ± 1.4	0.611 ± 0.055
E	1.28 ± 0.05	0.051 ± 0.002
F	14.9 ± 1.4	0.587 ± 0.055
G - 058C / 066C / 076C	7.41 ± 1.20	0.292 ± 0.047
G - 076C - F	8.91 ± 1.20	0.351 ± 0.047
G - 190C	9.20 ± 1.20	0.362 ± 0.047
G - 380C	17.30 ± 1.20	0.681 ± 0.047
L_1 / L_2	$L_1 = L_2$ Tolerance ± 1.0 mm (0 .04 inch)	

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Electrical Characteristics (T_A = 25 °C unless otherwise noted) Table 1

Model	Device Marking Code	Breakdown Voltage V_{BR}@I_T		Test Current I_T	Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_R	Typical Leakage I_R @85°C	Max. Clamping Voltage VCL @ I_{pp} Peak Pulse Current (I_{PP})			Max. Temp Coefficient OF V_{BR}	Max. Capacitance 0 Bias 10kHz
		Min	Max									
		(V)		(mA)	(V)	(μA)	(μA)	I_{PP} (8/20 μS) (A)	I_{PP} (10/350 μS) (A)	V_{CL} (V)	(%/°C)	(nF)
SPCL15 - 058C	15 - 058C	64	70	10	58	10	15	15000	2,000	110	0.1	16
SPCL15 - 066C	15 - 066C	72	80	10	66	10	15	15000	2,000	120	0.1	12
SPCL15 - 076C	15 - 076C	85	95	10	76	10	15	15000	2,000	150	0.1	12
SPCL15 - 076C - F	15 - 076C - F	85	95	10	76	10	15	15000	2000	150	0.1	12
SPCL15 - 190C	15 - 190C	200	245	10	190	10	15	15000	1,500	290	0.1	5
SPCL15 - 380C	15 - 380C	401	443	10	380	10	15	15000	1100	520	0.1	4

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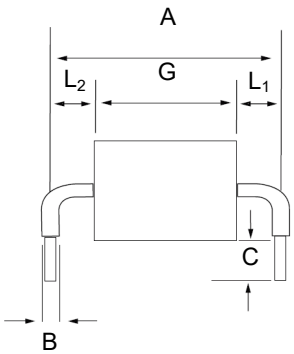
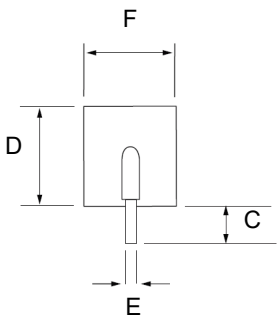
Package Outline Dimensions





Symbol	Millimeters	Inches
A	24.15 ± 0.8	0.95 ± 0.03
B	2.50 ± 0.70	0.100 ± 0.028
C	6.0 ± 1.0	0.236 ± 0.04
D	15.5 ± 1.4	0.611 ± 0.055
E	1.28 ± 0.05	0.051 ± 0.002
F	14.9 ± 1.4	0.587 ± 0.055
G - 016C	4.0 Max.	0.157 Max.
G - 058C / 066C / 076C	7.8 Max.	0.307 Max.
G - 076C - F	8.5 Max.	0.335 Max.
L_1 / L_2	$L_1 = L_2$ Tolerance ± 0.04 inch (1.0 mm)	

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Electrical Characteristics (T_A=25 °C unless otherwise noted)Table 1

Model	Device Marking Code	Breakdown Voltage V_{BR}@I_T		Test Current I_T	Stand-off Voltage V_R	Max. Reverse Leakage I_R@V_R	Typical Leakage I_R @85°C	Max. Clamping Voltage VCL @ I_{pp} Peak Pulse Current (I_{PP})			Max. Temp Coefficient OF V_{BR}	Max. Capacitance 0 Bias 10kHz
		Min	Max									
		(V)		(mA)	(V)	(μA)	(μA)	I_{PP} (8/20 μS) (A)	I_{PP} (10/350 μS) (A)	V_{CL} (V)	(%/°C)	(nF)
SPCL20 - 016C	20 - 016C	17.5	19.3	10	16	5	15	20000	3200	30	0.1	50
SPCL20 - 058C	20 - 058C	64	70	10	58	5	15	20000	3200	120	0.1	15
SPCL20 - 066C	20 - 066C	72	80	10	66	5	15	20000	3200	130	0.1	12
SPCL20 - 076C	20 - 076C	85	95	10	76	5	15	20000	3200	160	0.1	12
SPCL20 - 076C - F	20 - 076C - F	85	95	10	76	5	15	20000	3200	160	0.1	12

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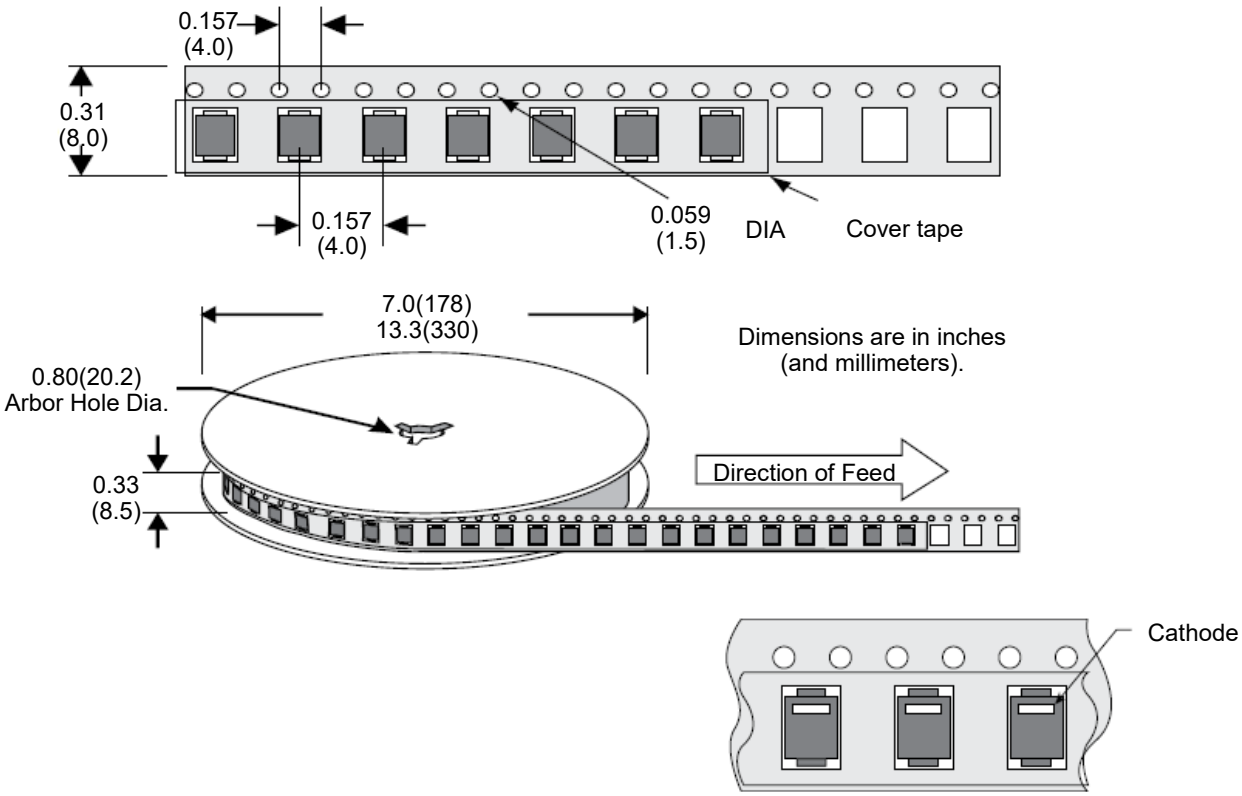
Packaging Information

SMF / P4SMF Series



Model	Package	QTY' s (Reel)	Packaging Option	Packaging Specification
SMFXXX	SOD-123FL	3000 PCS	Tape & Reel – 8 mm tape/7" reel	EIA RS-481
P4SMFXXX	SOD-123FL	3000 PCS	Tape & Reel – 8 mm tape/7" reel	EIA RS-481

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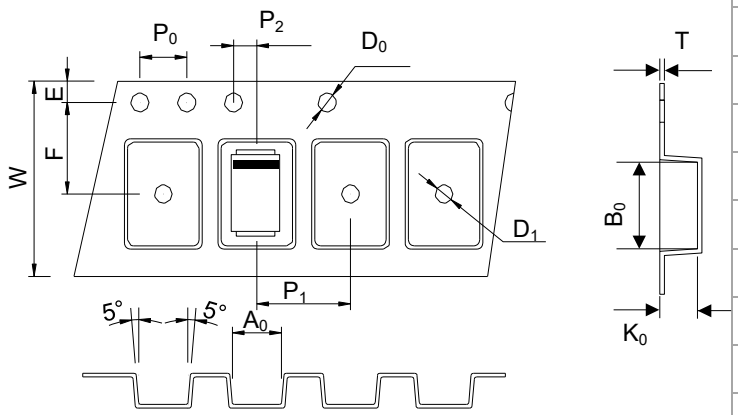
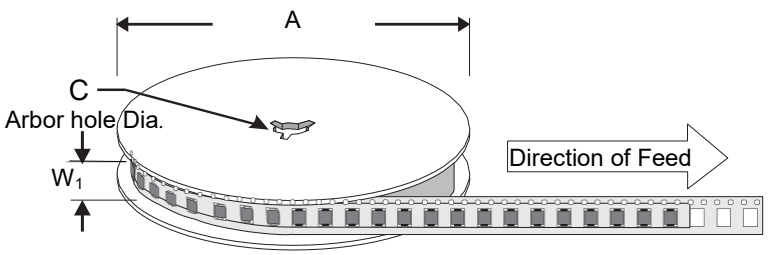
SMAJ / P4SMA / SMA6J Series

Tape	Symbol	Dimension (mm)
	W	12.00 + 0.30 / -0.10
	P_0	4.00 ± 0.10
	P_1	8.00 ± 0.10
	P_2	2.00 ± 0.05
	D_0	1.55 ± 0.05
	D_1	1.55 ± 0.05
	E	1.75 ± 0.10
	F	5.50 ± 0.05
	A_0	2.79 ± 0.10
	B_0	5.33 ± 0.10
	K_0	2.36 ± 0.10
	T	0.30 ± 0.05

Reel Size	13” Reel	
	A	330 mm
	C	13.2 mm
	W_1	12.5 mm

Model	Package	QTY’ s (Reel)	Packaging Option	Packaging Specification
SMAJ×××	DO-214AC	5000 PCS	Tape & Reel – 12 mm tape/13” reel	EIA STD RS-481
P4SMA×××	DO-214AC	5000 PCS	Tape & Reel – 12 mm tape/13” reel	EIA STD RS-481
SMA6J×××	DO-214AC	5000 PCS	Tape & Reel – 12 mm tape/13” reel	EIA STD RS-481

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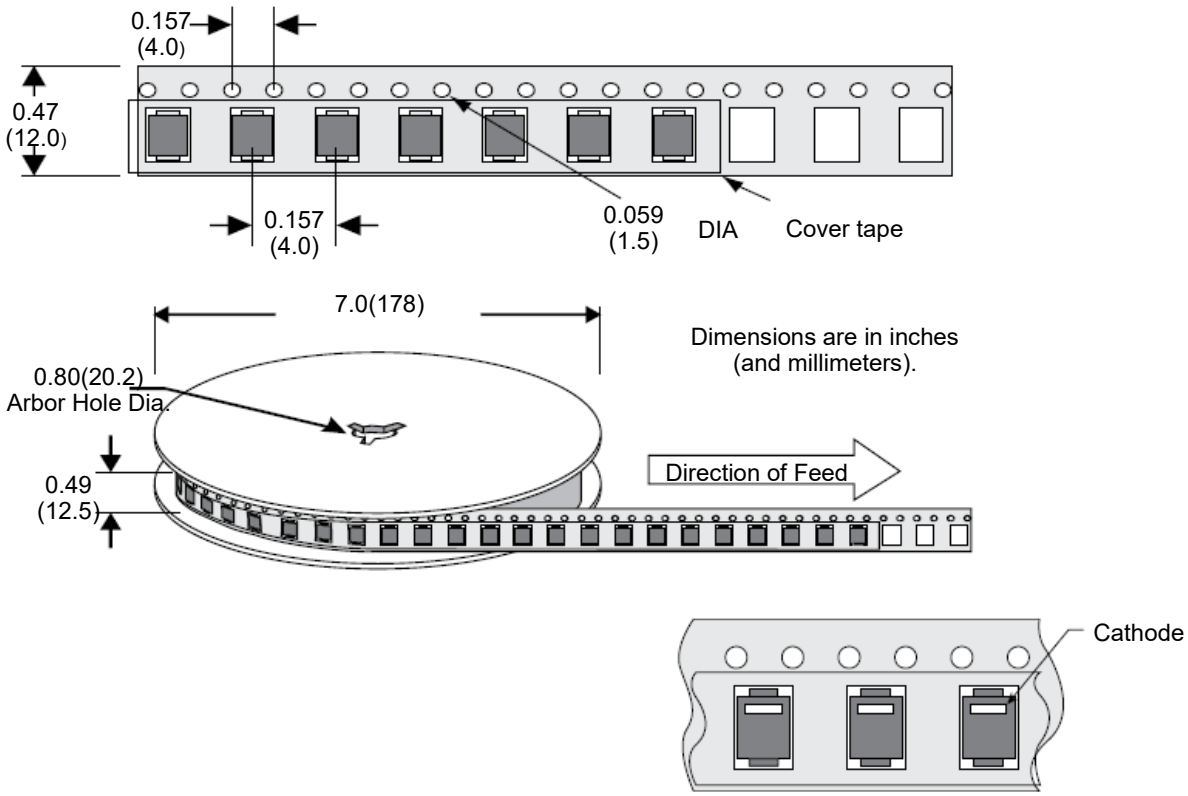
SMA6L Series



Model	Package	QTY (Reel)	Packaging Option	Packaging Specification
SMA6LxxA	DO-221AC	2000 PCS	Tape & Reel – 12 mm/7" tape	EIA RS-481

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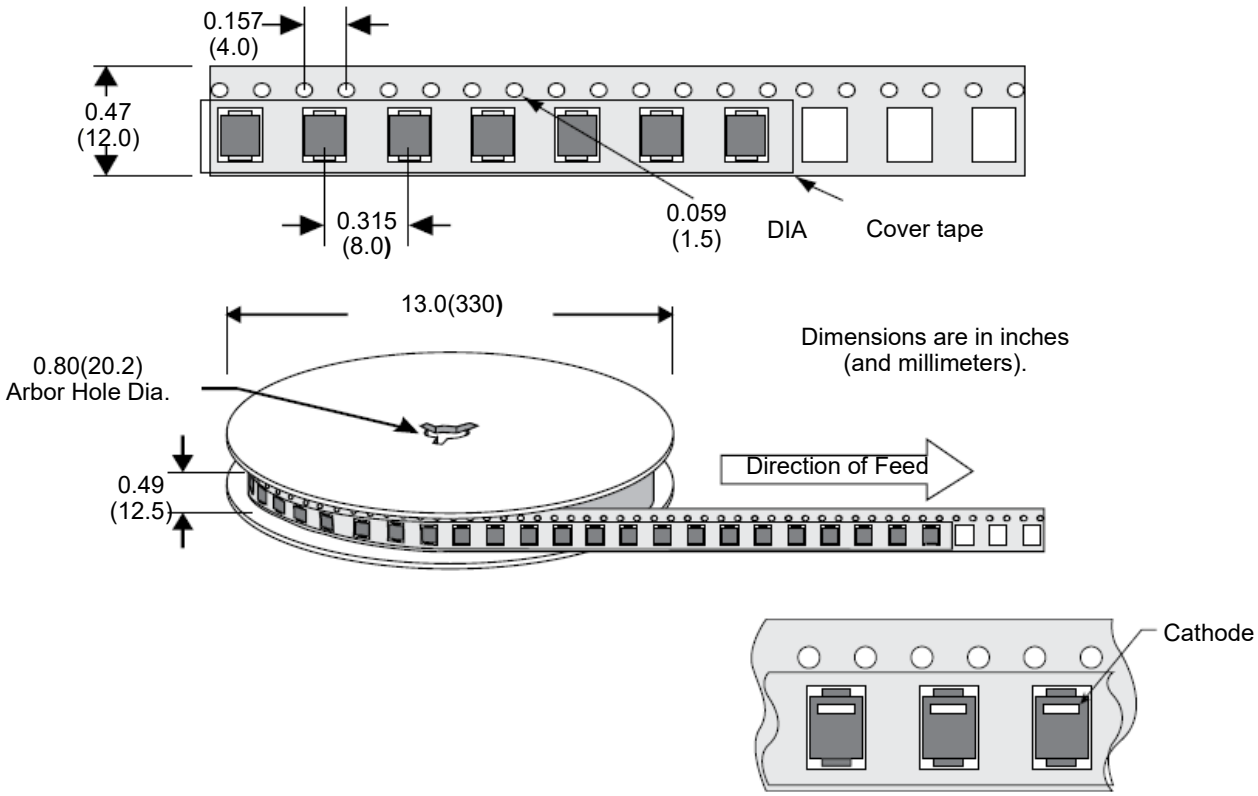
SACB Series



Model	Package	QTY (Reel)	Packaging Option	Packaging Specification
SACBXX	DO-214AA	3000 PCS	Tape & Reel - 12 mm tape/13” reel	EIA RS-481

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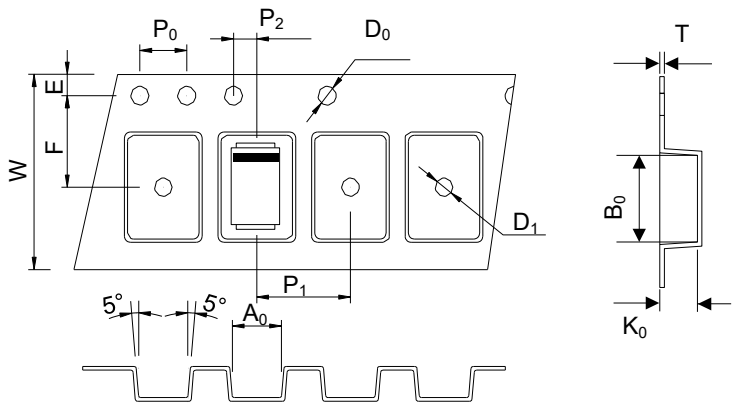
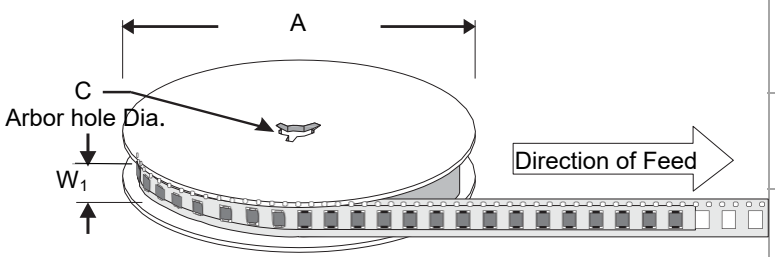
SMBJ / P6SMB Series

Tape	Symbol	Dimension (mm)
	W	12.00 + 0.30 / -0.10
	P_0	4.00 ± 0.10
	P_1	8.00 ± 0.10
	P_2	2.00 ± 0.05
	D_0	1.55 ± 0.05
	D_1	1.55 ± 0.05
	E	1.75 ± 0.1
	F	5.50 ± 0.05
	A_0	3.78 ± 0.10
	B_0	5.65 ± 0.15
	K_0	2.70 ± 0.10
	T	0.30 ± 0.05

Reel Size	13” Reel	
	A	330 mm
	C	13.2 mm
	W_1	12.5 mm

Model	Package	QTY’ s (Reel)	Packaging Option	Packaging Specification
SMBJ×××	DO-214AA	3000 PCS	Tape & Reel – 12 mm tape/13” reel	EIA STD RS-481
P6SMB×××	DO-214AA	3000 PCS	Tape & Reel – 12 mm tape/13” reel	EIA STD RS-481

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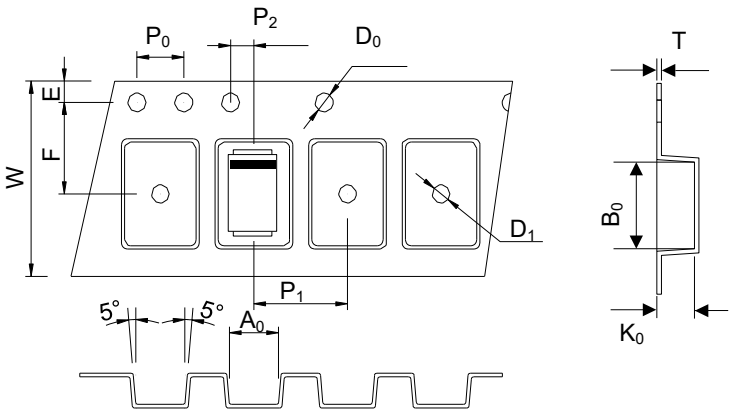
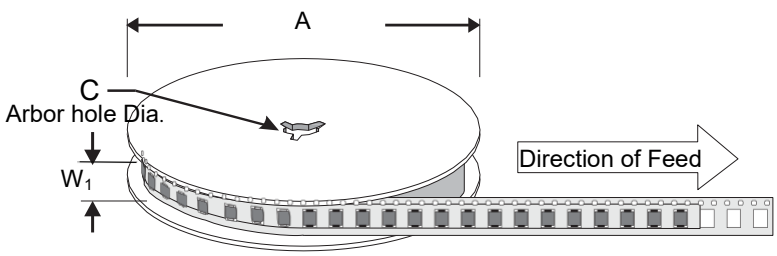
SMCJ / 1.5SMC / 3.0SMCJ / SMDJ / 5.0SMDJ Series

Tape	Symbol	Dimension (mm)
	W	16.00 + 0.3/0.10
	P_0	4.00 ± 0.10
	P_1	8.00 ± 0.10
	P_2	2.00 ± 0.10
	D_0	1.55 ± 0.05
	D_1	1.55 ± 0.05
	E	1.75 ± 0.10
	F	7.50 ± 0.10
	A_0	6.15 ± 0.10
	B_0	8.30 ± 0.10
	K_0	2.48 ± 0.10
	T	0.30 ± 0.05

Reel Size	13” Reel	
	A	330 mm
	C	13.2 mm
	W_1	16.4 mm

Model	Package	QTY’s (Reel)	Packaging Option	Packaging Specification
SMCJ×××	DO-214AB	3000 PCS	Tape & Reel – 16 mm tape/13” reel	EIA STD RS-481
1.5SMC×××	DO-214AB	3000 PCS	Tape & Reel – 16 mm tape/13” reel	EIA STD RS-481
3.0SMCJ×××	DO-214AB	3000 PCS	Tape & Reel – 16 mm tape/13” reel	EIA STD RS-481
SMDJ×××	DO-214AB	3000 PCS	Tape & Reel – 16 mm tape/13” reel	EIA STD RS-481
5.0SMDJ×××	DO-214AB	3000 PCS	Tape & Reel – 16 mm tape/13” reel	EIA STD RS-481

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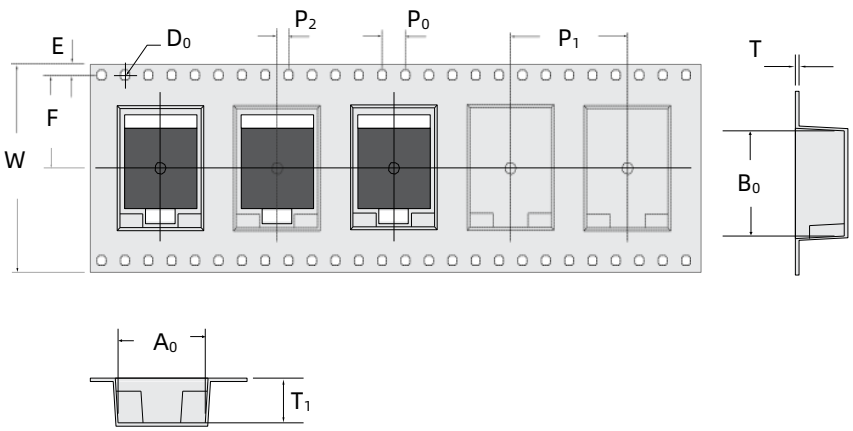
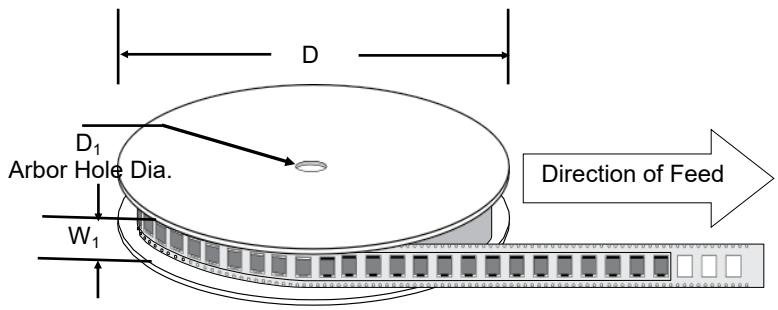
SPC1 /SPC3 /SPC6 / SPC10 Series



Tape	Symbol	Millimeters	Inches
	W	32 ± 0.3	1.260 ± 0.012
	E	1.75 ± 0.1	0.069 ± 0.004
	F	14.2 ± 0.1	0.559 ± 0.004
	D_0	1.5 + 0.1/0.0	0.059 + 0.004 / - 0.0
	P_0	4.0 ± 0.1	0.102 ± 0.004
	P_1	20.0 ± 0.1	0.787 ± 0.004
	P_2	2.0 ± 0.1	0.079 ± 0.004
	A_0	14.5 ± 0.1	0.571 ± 0.004
	B_0	18.5 ± 0.1	0.728 ± 0.004
	T	0.40	0.016
	T_1	7.8	0.029



Reel Size	Symbol	Millimeters	Inches
	D	Φ 13.0	Φ 330.0
	D_1	Φ0.52 ± 0.008	Φ13.2 ± 0.2
	W_1	1.417 ± 0.079	36.0 ± 2.0

Model	Weight	Packaging Option	QTY' s
SPCXX - XXXXC	4.33 g	Tape & Reel – 32 mm/13" tape	400 PCS

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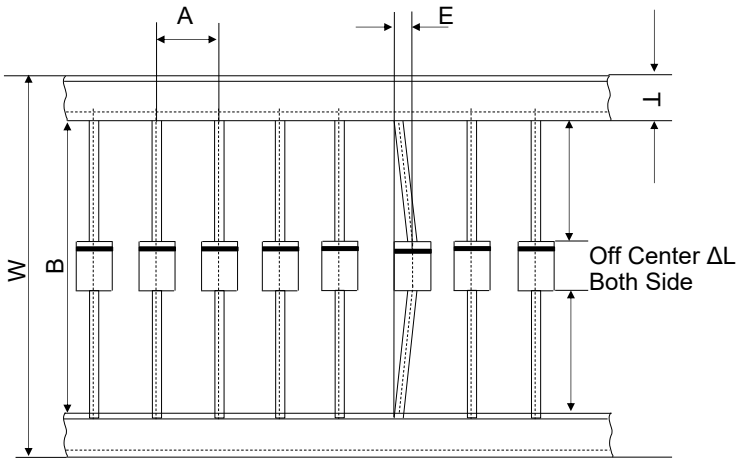
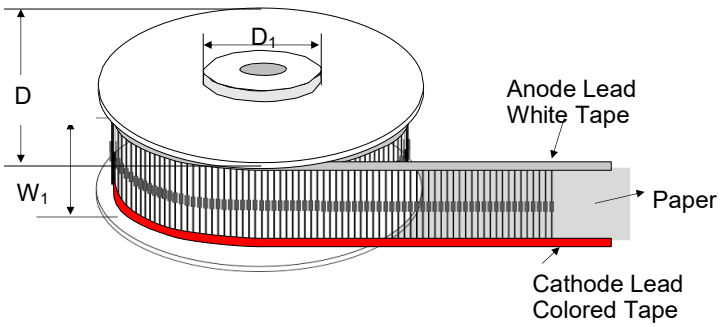
P4KE / SAC / P6KE / 1.5KE / LEC / 5KP / 10KPA / 15KPA / 20KPA / 30KPA Series

Tape



Tape & Reel (T / R)



Symbol	Unit	Package									
		P4KE	SAC	P6KE	1.5KE	LCE	5KP	10KPA	15KPA	20KPA	30KPA
A	Millimeters	5 ± 0.5			10 ± 0.5						
	Inches	0.179 ± 0.020			0.394 ± 0.020						
B	Millimeters	53.0 + 2.0 / -1.0			53.0 + 2.0 / -1.0						
	Inches	2.063 + 0.079 / - 0.039			2.063 + 0.079 / - 0.039						
E	Millimeters	1.2			1.2						
	Inches	0.047			0.047						
W	Millimeters	65			65						
	Inches	2.56			2.56						
T	Millimeters	6			6						
	Inches	0.236			0.236						
ΔL	Millimeters	0.7 max			0.7 max						
	Inches	0.028			0.028						
D	Millimeters	330			330						
	Inches	13			13						
D_1	Millimeters	76.2			76.2						
	Inches	3			3						
W_1	Millimeters	69.85			69.85						
	Inches	2.75			2.75						

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Packaging Information

Model	Component Package	QTY's	Package Option	Packaging Specification
P4KExxxXX	DO-204AL	5000 PCS	Tape & Reel	EIA STD RS-296
P4KExxxXX-TB	DO-204AL	5000 PCS	TB	/
P4KExxxXX-B	DO-204AL	500 PCS	Bulk	SETsafe | SETfuse Spec
SACxxxXX	DO-204AC	4000 PCS	Tape & Reel	EIA STD RS-296
SACxxxXX-TB	DO-204AC	3000 PCS	TB	/
SACxxxXX-B	DO-204AC	1000 PCS	Bulk	SETsafe | SETfuse Spec
P6KExxxXX	DO-204AC	4000 PCS	Tape & Reel	EIA STD RS-296
P6KExxxXX-TB	DO-204AC	3000 PCS	TB	/
P6KExxxXX-B	DO-204AC	1000 PCS	Bulk	SETsafe | SETfuse Spec
1.5KExxxXX	DO-201	1200 PCS	Tape & Reel	EIA STD RS-296
1.5KExxxXX-TB	DO-201	1200 PCS	TB	/
1.5KExxxXX-B	DO-201	500 PCS	Buik	SETsafe | SETfuse Spec
LCExxxXX	DO-201	1200 PCS	Tape & Reel	EIA STD RS-296
LCExxxXX-TB	DO-201	1250 PCS	TB	EIA STD RS-296
LCExxxXX-B	DO-201	500 PCS	Bulk	SETsafe | SETfuse Spec
5KPxxxXX	P600	800 PCS	Tape & Reel	EIA STD RS-296
5KPxxxXX-TB	P600	300 PCS	TB	/
5KPxxxXX-B	P600	100 PCS	Bulk	SETsafe | SETfuse Spec
15KPAxxxXX	P600	800 PCS	Tape & Reel	EIA STD RS-296
15KPAxxxXX-TB	P600	300 PCS	TB	/
15KPAxxxXX-B	P600	100 PCS	Bulk	SETsafe | SETfuse Spec
20KPAxxxXX	P600	800 PCS	Tape & Reel	EIA STD RS-296
20KPAxxxXX-TB	P600	300 PCS	TB	EIA STD RS-296
20KPAxxxXX-B	P600	100 PCS	Bulk	SETsafe | SETfuse Spec
30KPAxxxXX	P600	800 PCS	Tape & Reel	EIA STD RS-296
30KPAxxxXX-TB	P600	300 PCS	TB	/
30KPAxxxXX-B	P600	100 PCS	Bulk	SETsafe | SETfuse Spec

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SPCL1/SPCL3/SPCL6/SPCL10/SPCL15/SPCL20 Series

Model	Package	QTY's	Packaging Option
SPCL1-XXXX	SPCL Package	56 PCS / Inner Box	Bulk
SPCL1-XXXX-12	SPCL Package	12 PCS / Inner Box	Bulk
SPCL3-XXXX	SPCL Package	56 PCS / Inner Box	Bulk
SPCL3-XXXX-12	SPCL Package	12 PCS / Inner Box	Bulk
SPCL6-XXXX	SPCL Package	56 PCS / Inner Box	Bulk
SPCL6-XXXX-12	SPCL Package	12 PCS / Inner Box	Bulk
SPCL10-XXXX	SPCL Package	56 PCS / Inner Box	Bulk
SPCL10-XXXX-12	SPCL Package	12 PCS / Inner Box	Bulk
SPCL15-XXXX	SPCL Package	56 PCS / Box	Bulk
SPCL15-XXXX-12	SPCL Package	12 PCS / Box	Bulk
SPCL20-XXXX	SPCL Package	56 PCS / Box	Bulk
SPCL20-XXXX-12	SPCL Package	12 PCS / Box	Bulk

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