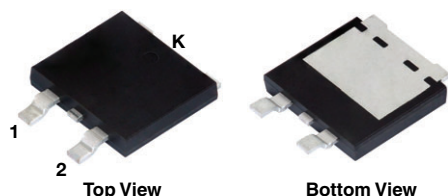
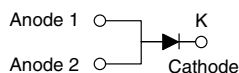


## Surface-Mount ESD Capability Rectifiers

### eSMP® Series SMPD (TO-263AC)



#### SE10DX



### FEATURES

- Very low profile - typical height of 1.7 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- ESD capability
- AEC-Q101 qualified
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both consumer and automotive applications.

### ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
$V_{RRM}$	100 V, 200 V, 400 V, 600 V
$I_{FSM}$	110 A
$V_F$ at $I_F = 10$ A ( $T_A = 125$ °C)	0.96 V
$I_R$	15 $\mu$ A
$T_J$ max.	175 °C
Package	SMPD (TO-263AC)
Circuit configuration	Single

### MECHANICAL DATA

**Case:** SMPD (TO-263AC)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** as marked

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	SE10DB	SE10DD	SE10DG	SE10DJ	UNIT
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	100	200	400	600	V
Maximum DC forward current	I <sub>F</sub> <sup>(1)</sup>	10				A
	I <sub>F</sub> <sup>(2)</sup>	3.0				
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	110				A
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175				°C

#### Notes

(1) With heatsink

(2) Free air, mounted on recommended copper pad area

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.95	-	V
	I <sub>F</sub> = 10 A			1.04	1.15	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.85	-	
	I <sub>F</sub> = 10 A			0.96	1.10	
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	15	μA
		T <sub>A</sub> = 125 °C		22	150	
Typical reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	3000	-	ns
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	67	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	SYMBOL	SE10DB	SE10DD	SE10DG	SE10DJ	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)(2)</sup>	60				°C/W
	R <sub>θJC</sub> <sup>(3)</sup>	1.6				

**Notes**(1) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ (2) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient

(3) With infinite heatsink

**IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS**( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
AEC-Q101-001	Human body model (contact mode)	$C = 100\text{ pF}$ , $R = 1.5\text{ k}\Omega$	$V_C$	H3B	$> 8\text{ kV}$

**ORDERING INFORMATION** (Example)

STANDARD	PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMPD (TO-263AC)	SE10DJ-M3/I	0.54	I	2000/reel	13" diameter plastic tape and reel
SMPD (TO-263AC)	SE10DJHM3/I <sup>(1)</sup>	0.54	I	2000/reel	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

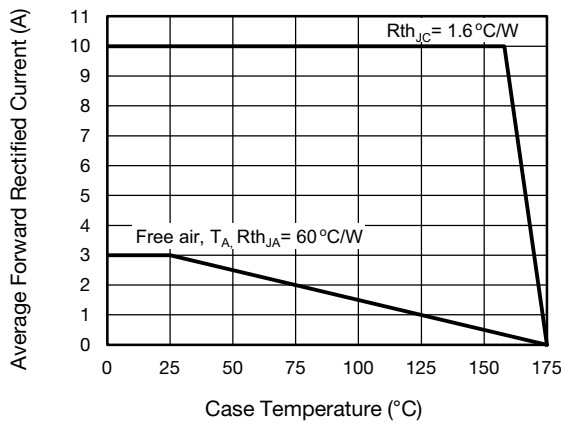
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

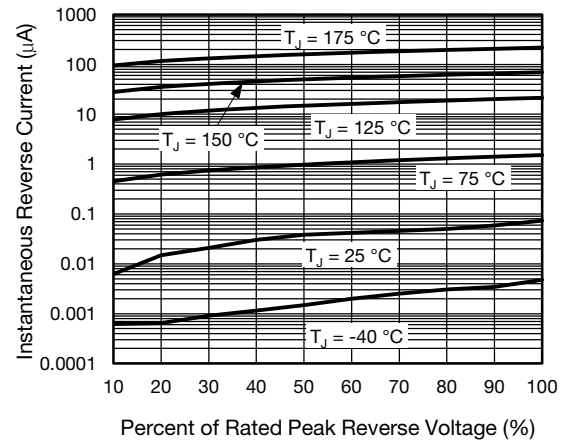


Fig. 4 - Typical Reverse Leakage Characteristics

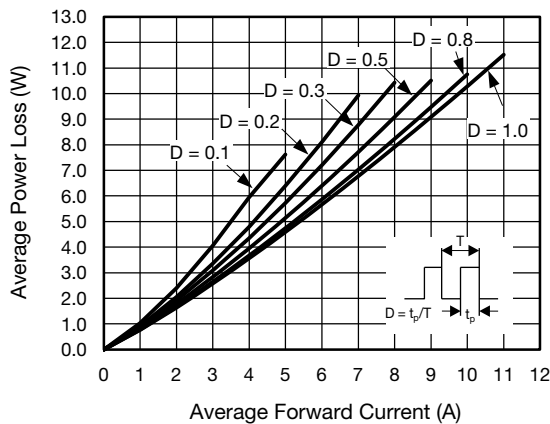


Fig. 2 - Forward Power Loss Characteristics

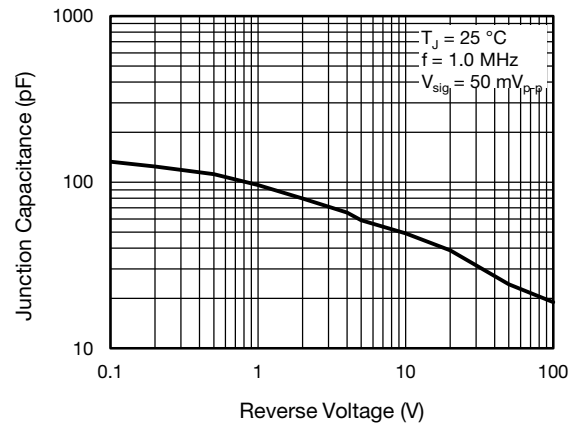


Fig. 5 - Typical Junction Capacitance

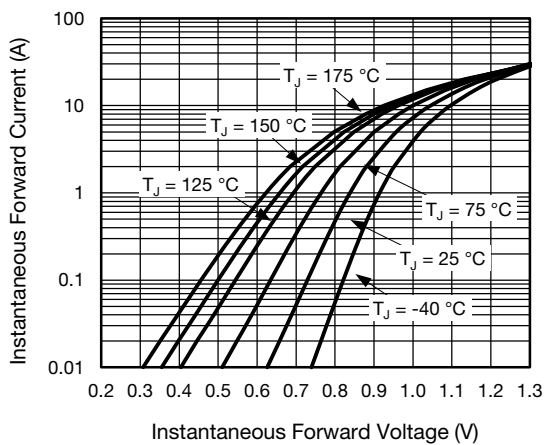


Fig. 3 - Typical Instantaneous Forward Characteristics

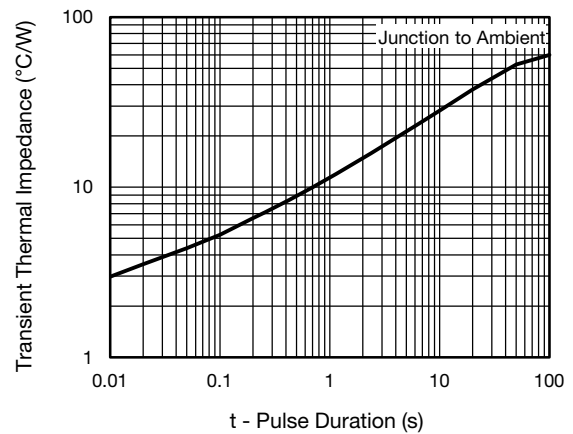
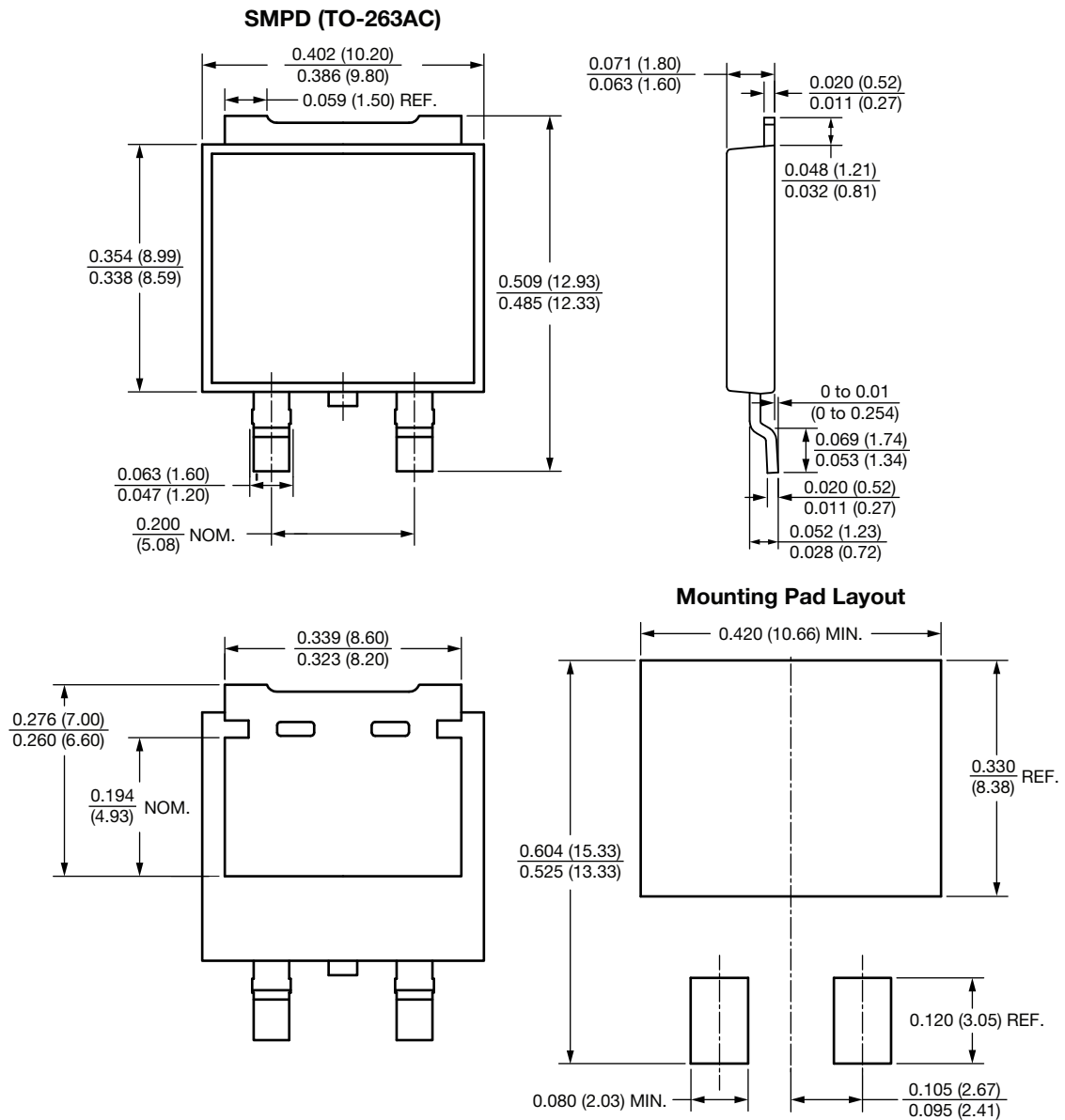


Fig. 6 - Typical Transient Thermal Impedance



**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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