

# SE10DB, SE10DD, SE10DG, SE10DJ

Vishay General Semiconductor

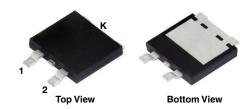
RoHS COMPLIANT

HALOGEN

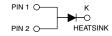
**FREE** 

# **Surface Mount ESD Capability Rectifiers**

## eSMP<sup>®</sup> Series TO-263AC (SMPD)



#### SE10DX



PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	10 A				
V <sub>RRM</sub>	100 V, 200 V, 400 V, 600 V				
I <sub>FSM</sub>	110 A				
$V_F$ at $I_F = 10$ A ( $T_A = 125$ °C)	0.96 V				
I <sub>R</sub>	15 μΑ				
T <sub>J</sub> max.	175 °C				
Package	TO-263AC (SMPD)				
Diode variations	Single				

#### **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 <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

#### TYPICAL APPLICATIONS

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

#### **MECHANICAL DATA**

Case: TO-263AC (SMPD)

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	$V_{RRM}$	V <sub>RRM</sub> 100 200 400 600		V		
Maximum DC forward current	I <sub>F</sub> <sup>(1)</sup>	10				Α
Maximum DC forward current	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			А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175			°C	

#### Notes

<sup>(1)</sup> With heat sink

<sup>(2)</sup> Free air, mounted on recommended copper pad area



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °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		0.95	-	V	
	I <sub>F</sub> = 10 A		V <sub>E</sub> (1)	1.04	1.15		
	I <sub>F</sub> = 5 A	- T <sub>A</sub> = 125 °C	V <sub>F</sub> (·/	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 T <sub>A</sub> = 125 °C	I <sub>R</sub> <sup>(2)</sup>	-	15	μА	
	nated v <sub>R</sub>		IR (-)	22	150		
Typical reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$		t <sub>rr</sub>	3000	-	ns	
Typical junction capacitance	4.0 V, 1 MHz		CJ	67	-	pF	

#### Notes

 $\stackrel{(1)}{\sim}$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle  $\stackrel{(2)}{\sim}$  Pulse test: Pulse width  $\leq 40~ms$ 

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °c unless otherwise noted)						
PARAMETER	SYMBOL	SE10DB SE10DD SE10DG SE10DJ UNIT				UNIT
Typical thermal resistance	R <sub>0JA</sub> (1)(2)	60				°C/W
Typical thermal resistance	R <sub>0</sub> JC (3)	1.6				C/VV

#### **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 ( $T_A = 25~^{\circ}\text{C}$ unless otherwise noted)					
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V <sub>C</sub>	НЗВ	> 8 kV

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

#### Note

(1) AEC-Q101 qualified

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## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

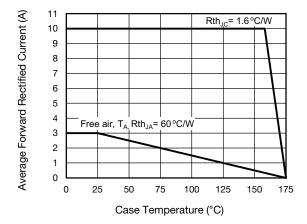


Fig. 1 - Forward Current Derating Curve

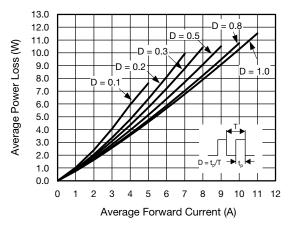


Fig. 2 - Forward Power Loss Characteristics

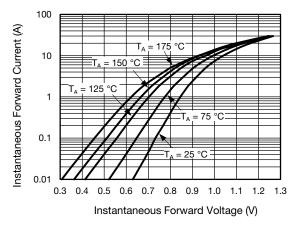


Fig. 3 - Typical Instantaneous Forward Characteristics

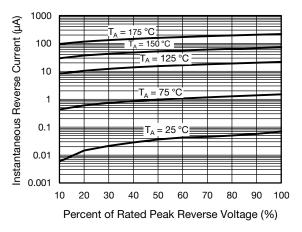


Fig. 4 - Typical Reverse Leakage Characteristics

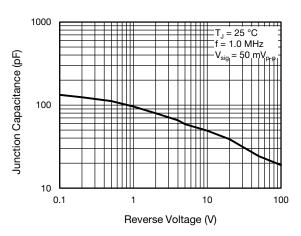


Fig. 5 - Typical Junction Capacitance

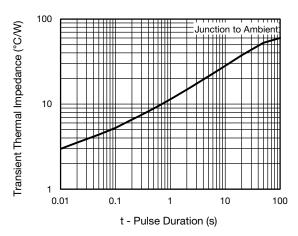
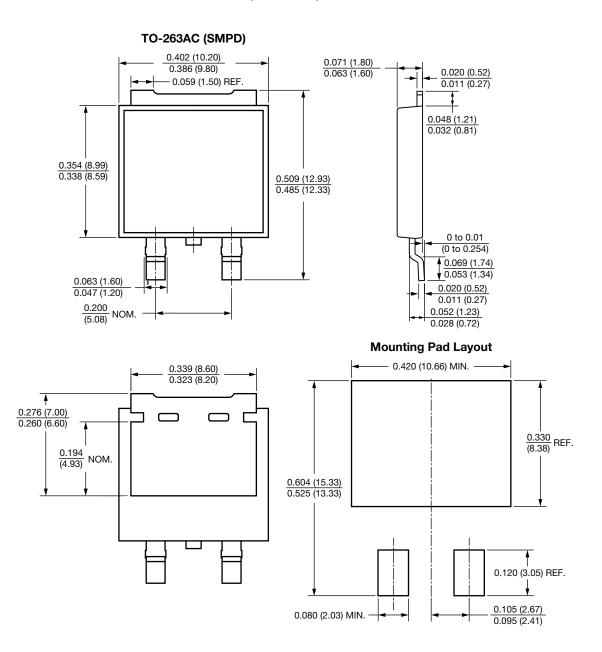


Fig. 6 - Typical Transient Thermal Impedance



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### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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