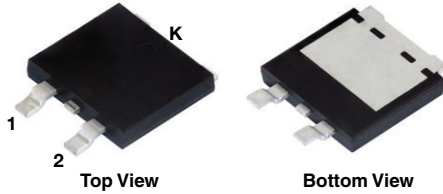
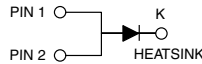


Surface Mount ESD Capability Rectifiers

eSMP® Series TO-263AC (SMPD)



SE12DX



RoHS
COMPLIANT
HALOGEN
FREE

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

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_{FSM}	125 A
V_F at $I_F = 12$ A ($T_A = 125$ °C)	0.96 V
I_R	20 μ A
T_J max.	175 °C
Package	TO-263AC (SMPD)
Diode variations	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)						
PARAMETER	SYMBOL	SE12DB	SE12DD	SE12DG	SE12DJ	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Maximum DC forward current	$I_F^{(1)}$	12				A
	$I_F^{(2)}$	3.2				
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	125				A
Operating junction and storage temperature range	T_J, T_{STG}	-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	$I_F = 6\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.95	-	V
	$I_F = 12\text{ A}$			1.04	1.15	
	$I_F = 6\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.85	-	
	$I_F = 12\text{ A}$			0.96	1.10	
Reverse current	Rated V_R	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	20	μA
		$T_A = 125\text{ }^\circ\text{C}$		27	150	
Typical reverse recovery time	$I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$		t_{rr}	3000	-	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	90	-	pF

Notes

- (1) Pulse test: 300 μs 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	SE12DB	SE12DD	SE12DG	SE12DJ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	60				$^\circ\text{C/W}$
	$R_{\theta JC}^{(3)}$	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
TO-263AC (SMPD)	SE12DJ-M3/I	0.54	I	2000/reel	13" diameter plastic tape and reel
TO-263AC (SMPD)	SE12DJHM3/I ⁽¹⁾	0.54	I	2000/reel	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

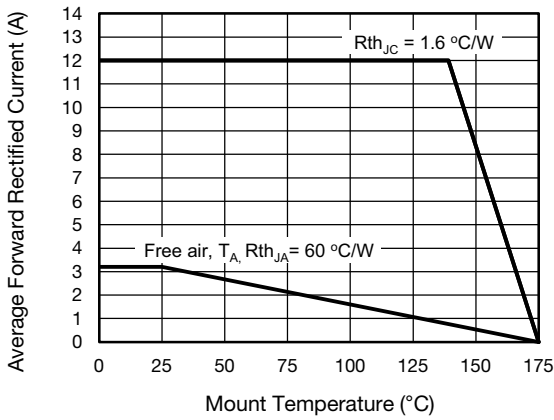


Fig. 1 - Forward Current Derating Curve

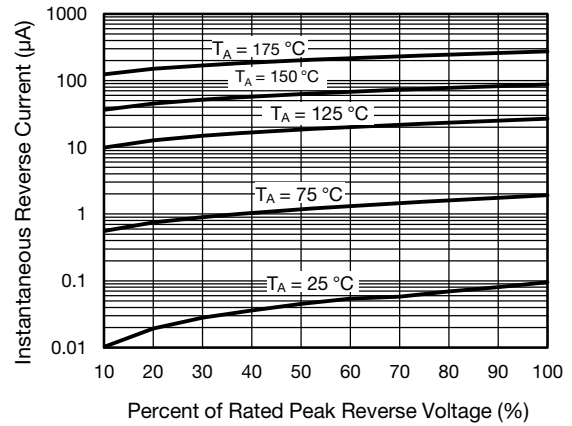


Fig. 4 - Typical Reverse Leakage Characteristics

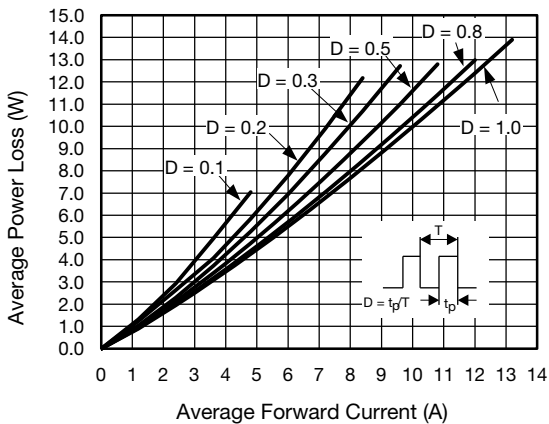


Fig. 2 - Forward Power Loss Characteristics

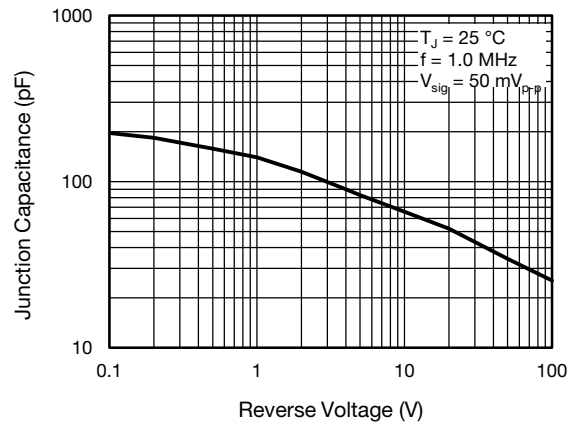


Fig. 5 - Typical Junction Capacitance

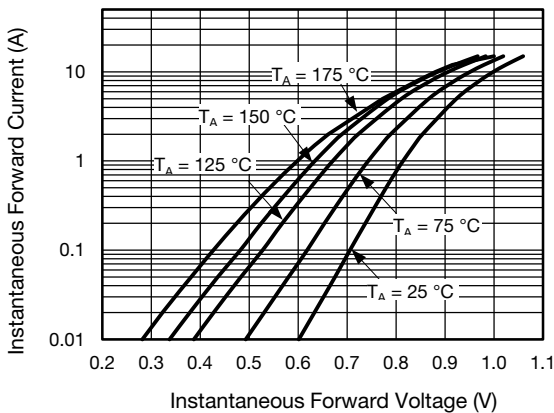


Fig. 3 - Typical Instantaneous Forward Characteristics

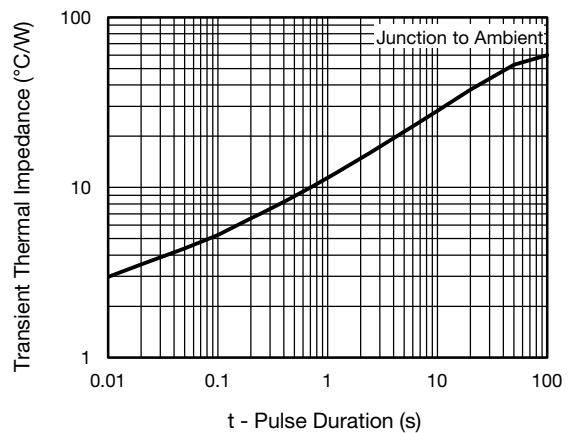
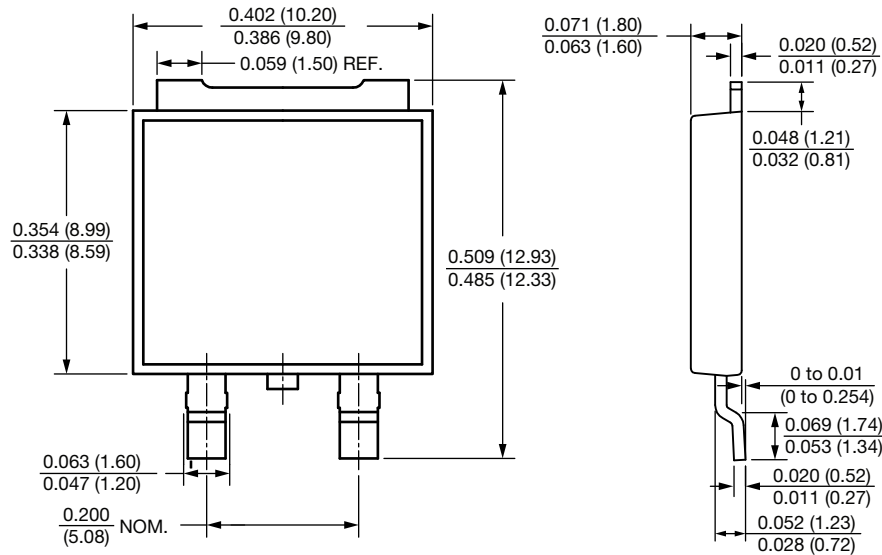


Fig. 6 - Typical Transient Thermal Impedance

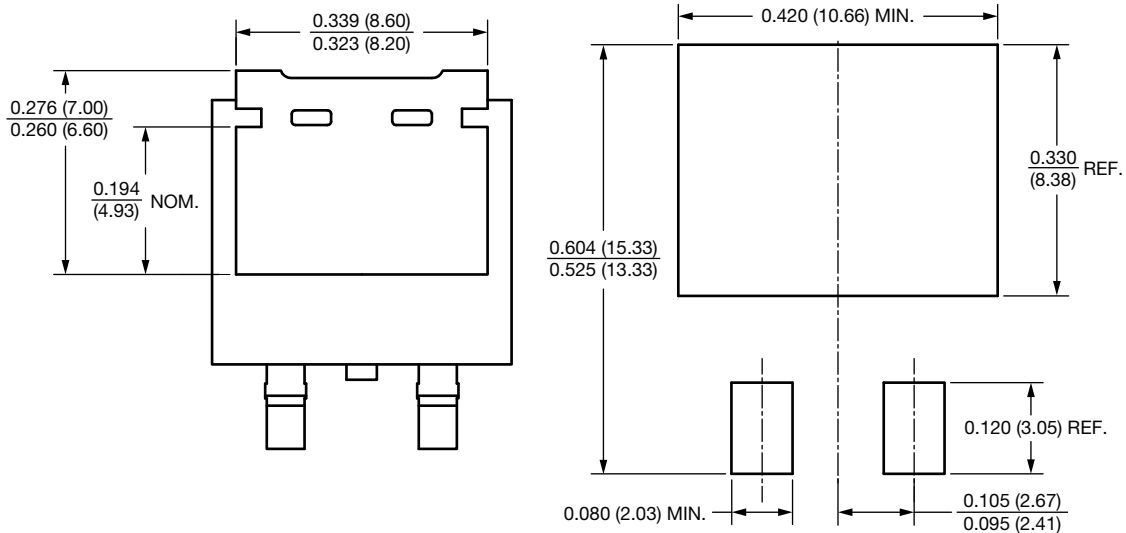


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AC (SMPD)



Mounting Pad Layout





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