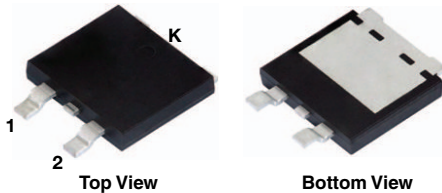
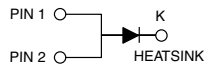


## Surface Mount ESD Capability Rectifiers

### eSMP® Series TO-263AC (SMPD)



#### SE20DX



| PRIMARY CHARACTERISTICS                 |                            |
|---|----------------------------|
| $I_{F(AV)}$                             | 20 A                       |
| $V_{RRM}$                               | 100 V, 200 V, 400 V, 600 V |
| $I_{FSM}$                               | 150 A                      |
| $V_F$ at $I_F = 20$ A ( $T_A = 125$ °C) | 1.03 V                     |
| $I_R$                                   | 25 $\mu$ A                 |
| $T_J$ 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 [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.

### 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 ( $T_A = 25$ °C unless otherwise noted)                           |                |             |        |        |        |      |
|---|----------------|-------------|--------|--------|--------|------|
| PARAMETER   | SYMBOL         | SE20DB      | SE20DD | SE20DG | SE20DJ | UNIT |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 100         | 200    | 400    | 600    | V    |
| Maximum DC forward current  | $I_F^{(1)}$    | 20          |        |        |        | A    |
|   | $I_F^{(2)}$    | 3.9         |        |        |        |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 150         |        |        |        | 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



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |  |                                   |             |      |      |               |
|--|--|-----------------------------------|-------------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS  |                                   | SYMBOL      | TYP. | MAX. | UNIT          |
| Instantaneous forward voltage  | $I_F = 10\text{ A}$  | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.98 | -    | V             |
|  | $I_F = 20\text{ A}$  |                                   |             | 1.10 | 1.20 |               |
|  | $I_F = 10\text{ A}$  | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.88 | -    |               |
|  | $I_F = 20\text{ A}$  |                                   |             | 1.03 | 1.15 |               |
| Reverse current  | Rated $V_R$  | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -    | 25   | $\mu\text{A}$ |
|  |  | $T_A = 125\text{ }^\circ\text{C}$ |             | 38   | 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   |                                   | $C_J$       | 150  | -    | pF            |

**Notes**

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

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                       |        |        |        |        |                    |
|---|-----------------------|--------|--------|--------|--------|--------------------|
| PARAMETER   | SYMBOL                | SE20DB | SE20DD | SE20DG | SE20DJ | UNIT               |
| Typical thermal resistance  | $R_{\theta JA}^{(1)}$ | 60     |        |        |        | $^\circ\text{C/W}$ |
|   | $R_{\theta JM}^{(2)}$ | 1.6    |        |        |        |                    |

**Notes**

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient  
(2) With heatsink

| <b>IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS</b><br>( $T_A = 25\text{ }^\circ\text{C}$ 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   | $> 8\text{ kV}$ |

| <b>ORDERING INFORMATION</b> (Example) |                            |                 |                        |               |                                    |
|---------------------------------------|----------------------------|-----------------|------------------------|---------------|------------------------------------|
| STANDARD                              | PREFERRED P/N              | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| TO-263AC (SMPD)                       | SE20DJ-M3/I                | 0.54            | I                      | 2000/reel     | 13" diameter plastic tape and reel |
| TO-263AC (SMPD)                       | SE20DJHM3/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<sub>A</sub> = 25 °C unless otherwise noted)

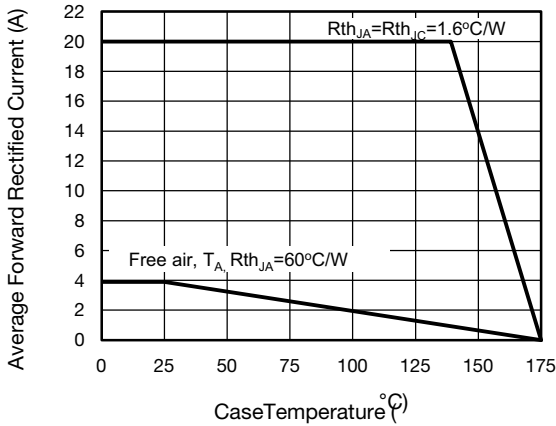


Fig. 1 - Forward Current Derating Curve

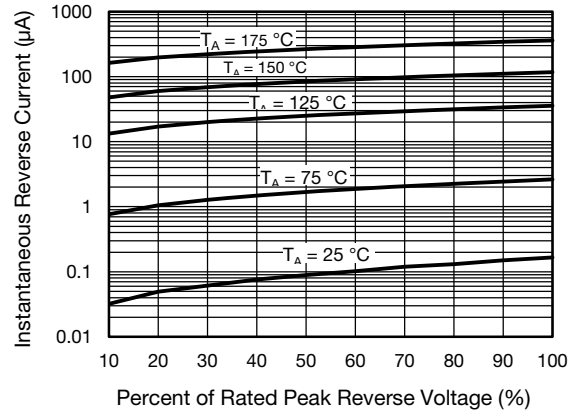


Fig. 4 - Typical Reverse Leakage Characteristics

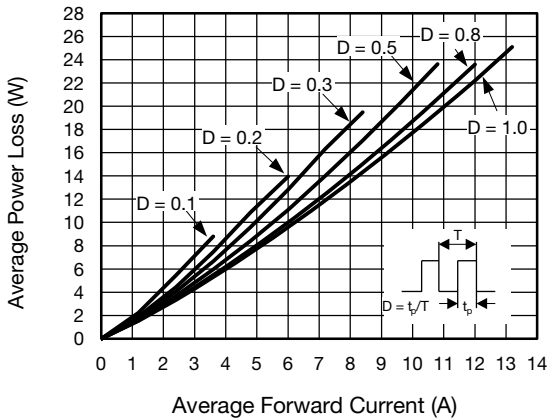


Fig. 2 - Forward Power Loss Characteristics

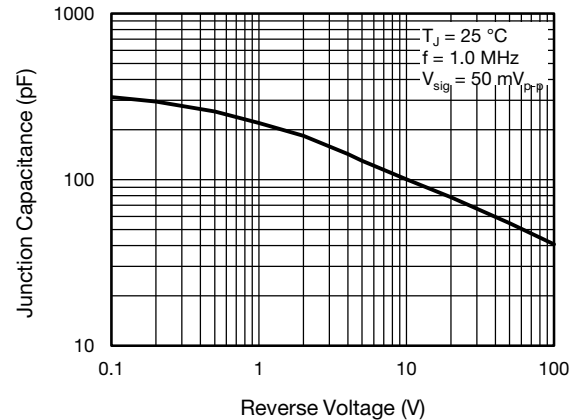


Fig. 5 - Typical Junction Capacitance

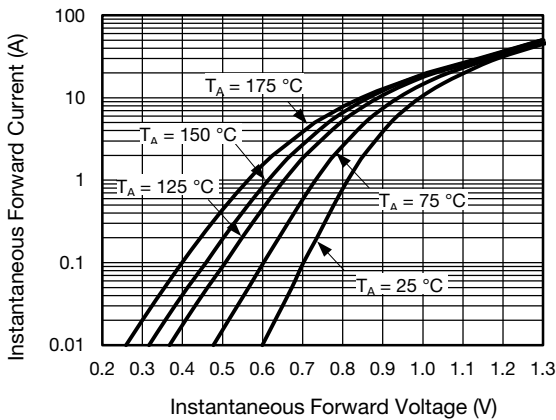


Fig. 3 - Typical Instantaneous Forward Characteristics

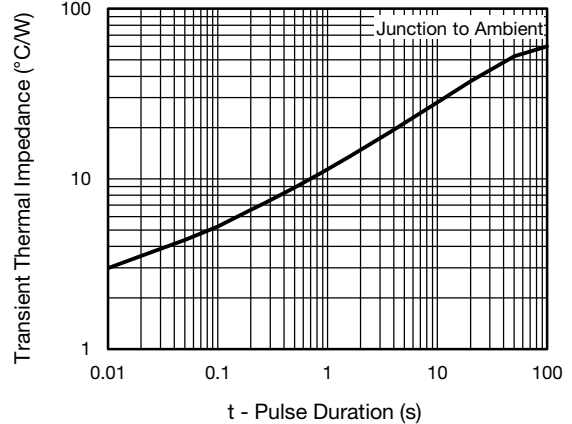
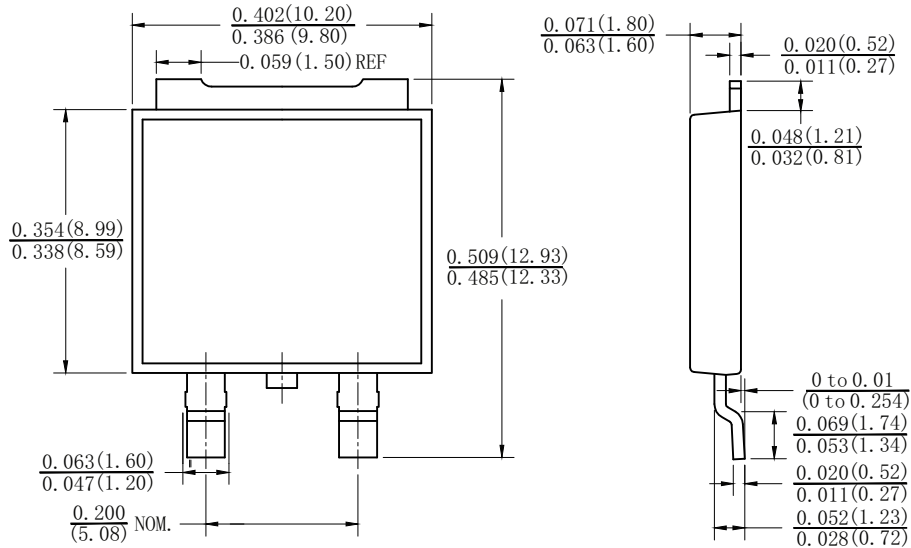


Fig. 6 - Typical Transient Thermal Impedance

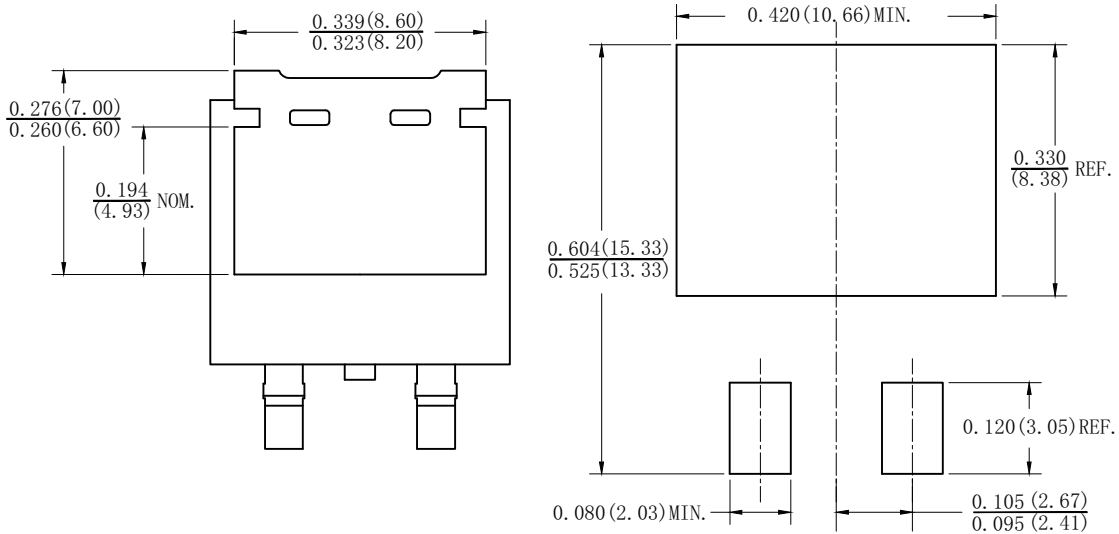


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-263AC (SMPD)



### Mounting Pad Layout





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