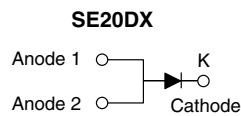
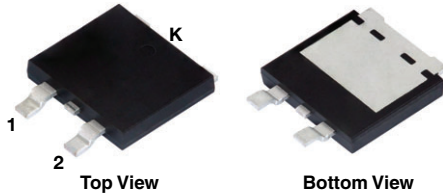


## Surface-Mount Low $V_F$ Standard Rectifiers

### eSMP® Series SMPD (TO-263AC)



### LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS                 |                 |
|---|-----------------|
| $I_{F(AV)}$                             | 20 A            |
| $V_{RRM}$                               | 400 V, 600 V    |
| $I_{FSM}$                               | 200 A           |
| $V_F$ at $I_F = 20$ A ( $T_A = 125$ °C) | 0.85 V          |
| $T_J$ max.                              | 175 °C          |
| Package                                 | SMPD (TO-263AC) |
| Circuit configuration                   | Single          |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                           |                      |             |         |      |
|---|----------------------|-------------|---------|------|
| PARAMETER   | SYMBOL               | SE20DLG     | SE20DLJ | UNIT |
| Device marking code   |                      | SE20DLG     | SE20DLJ |      |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$            | 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 | $I_{FSM}$            | 200         |         | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}^{(3)}$ | -55 to +175 |         | °C   |

#### Notes

- (1) Mounted on infinite heatsink
- (2) Free air, mounted on recommended copper pad area
- (3) The heat generated must be less than the thermal conductivity from junction to ambient  $dP_D/dT_J < R_{thJA}$

### FEATURES

- Very low profile - typical height of 1.7 mm
- Low forward voltage drop
- AEC-Q101 qualified available
- 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:** 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 and HM3 suffix meet JESD 201 class 2 whisker test

**Polarity:** as marked



| ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |  |                                   |             |      |      |               |
|---|--|-----------------------------------|-------------|------|------|---------------|
| PARAMETER   | TEST CONDITIONS  |                                   | SYMBOL      | TYP. | MAX. | UNIT          |
| Instantaneous forward voltage   | $I_F = 10\text{ A}$  | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.86 | -    | V             |
|   | $I_F = 20\text{ A}$  |                                   |             | 0.95 | 1    |               |
|   | $I_F = 10\text{ A}$  | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.73 | -    |               |
|   | $I_F = 20\text{ A}$  |                                   |             | 0.85 | 0.9  |               |
| Reverse current   | Rated $V_R$  | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -    | 5    | $\mu\text{A}$ |
|   |  | $T_A = 125\text{ }^\circ\text{C}$ |             | 13   | 100  |               |
| Typical reverse recovery time   | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$ |                                   | $t_{rr}$    | 330  | -    | ns            |
| Typical junction capacitance  | 4.0 V, 1 MHz   |                                   | $C_J$       | 160  | -    | 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                   | SE20DLG | SE20DLJ | UNIT               |
| Typical thermal resistance   | $R_{\theta JA}^{(1)(2)}$ | 55      |         | $^\circ\text{C/W}$ |
|  | $R_{\theta JM}^{(3)}$    | 1       |         |                    |
|  |                          |         |         |                    |

**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 to follow JEDEC<sup>®</sup> 51-2A  
(3) Mounted on infinite heatsink thermal resistance  $R_{\theta JM}$  - junction to mount to follow JEDEC<sup>®</sup> 51-14 transient dual interface test method (TDIM)

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| SE20DLJ-M3/I                   | 0.543           | I                      | 2000/reel     | 13" diameter plastic tape and reel |
| SE20DLJHM3/I <sup>(1)</sup>    | 0.543           | 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)

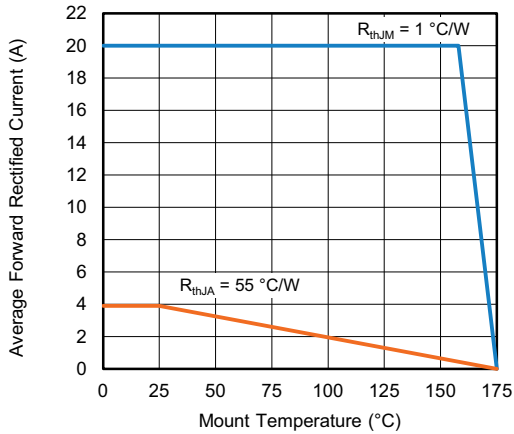


Fig. 1 - Forward Current Derating Curve

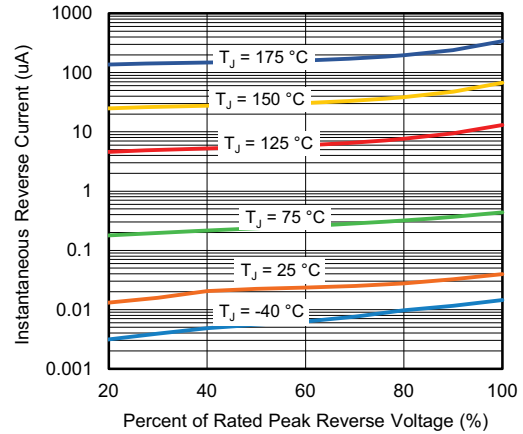


Fig. 4 - Typical Reverse Leakage Characteristics

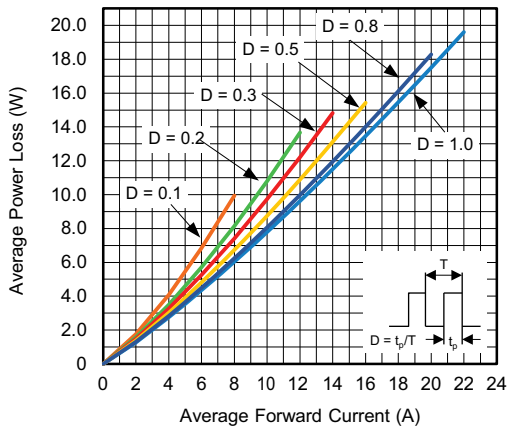


Fig. 2 - Forward Power Loss Characteristics

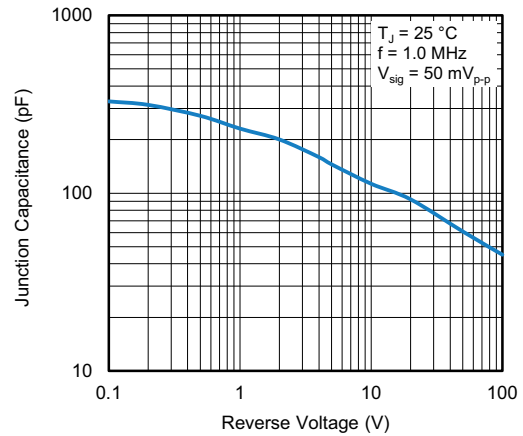


Fig. 5 - Typical Junction Capacitance

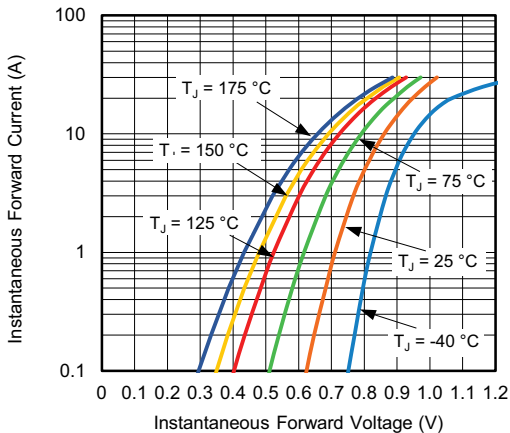


Fig. 3 - Typical Instantaneous Forward Characteristics

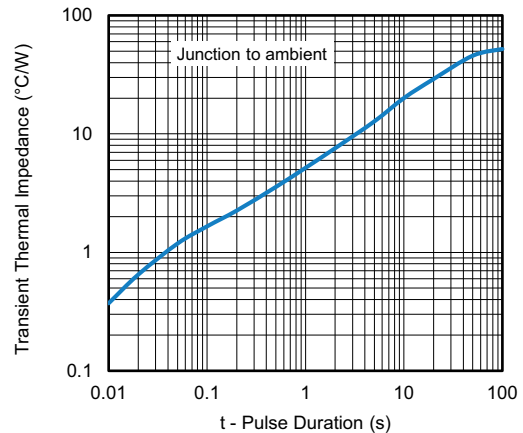
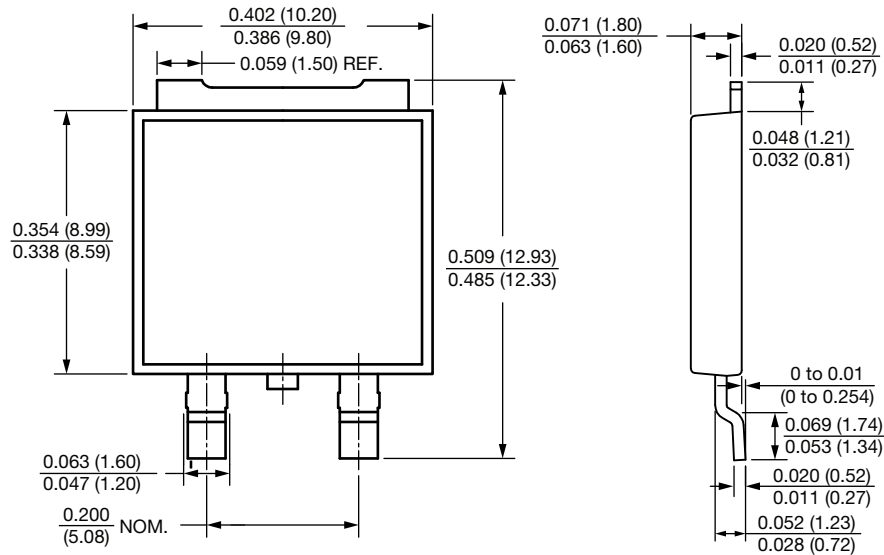


Fig. 6 - Typical Transient Thermal Impedance

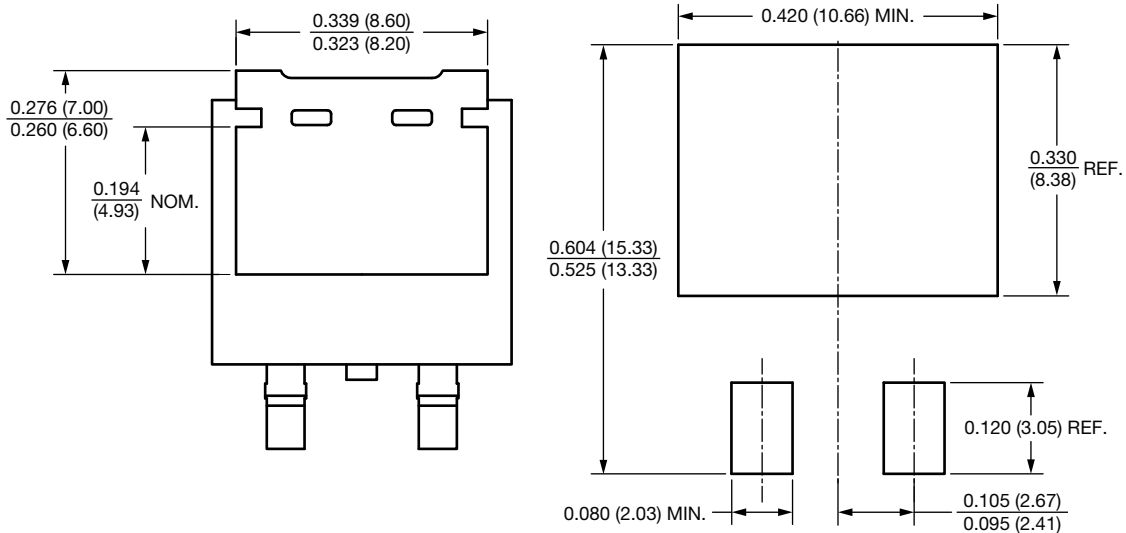


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### SMPD (TO-263AC)



#### Mounting Pad Layout





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