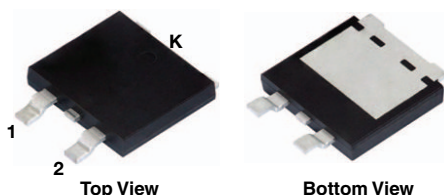
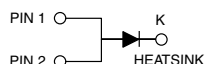


Surface Mount ESD Capability Rectifiers

eSMP® Series TO-263AC (SMPD)



SE20DX



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.

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 μ A |
| T_J max. | 175 °C |
| Package | TO-263AC (SMPD) |
| Diode variations | Single |

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)

| 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



| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | |
|--|--|-------------------------|-------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 10 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.98 | - | V |
| | I _F = 20 A | | | 1.10 | 1.20 | |
| | I _F = 10 A | T _A = 125 °C | | 0.88 | - | |
| | I _F = 20 A | | | 1.03 | 1.15 | |
| Reverse current | Rated V _R | T _A = 25 °C | I _R ⁽²⁾ | - | 25 | μA |
| | | T _A = 125 °C | | 38 | 150 | |
| Typical reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | | t _{rr} | 3000 | - | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 150 | - | 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 °c unless otherwise noted) | | | | | | |
|---|---------------------------------|--------|--------|--------|--------|------|
| PARAMETER | SYMBOL | SE20DB | SE20DD | SE20DG | SE20DJ | UNIT |
| Typical thermal resistance | R _{θJA} ⁽¹⁾ | 60 | | | | °C/W |
| | R _{θJM} ⁽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

| 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) | SE20DJ-M3/I | 0.54 | I | 2000/reel | 13" diameter plastic tape and reel |
| TO-263AC (SMPD) | SE20DJHM3/I ⁽¹⁾ | 0.54 | I | 2000/reel | 13" diameter plastic tape and reel |

Note

(1) AEC-Q101 qualified



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

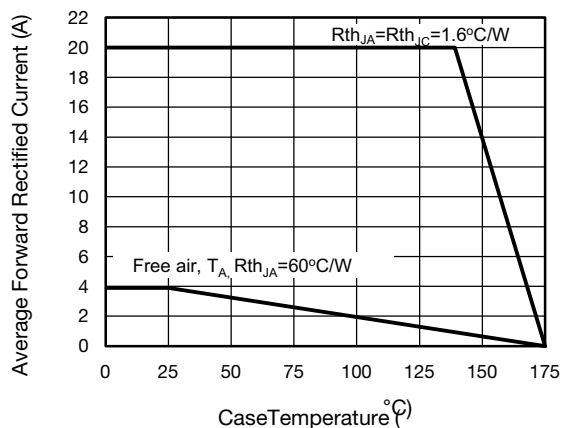


Fig. 1 - Forward Current Derating Curve

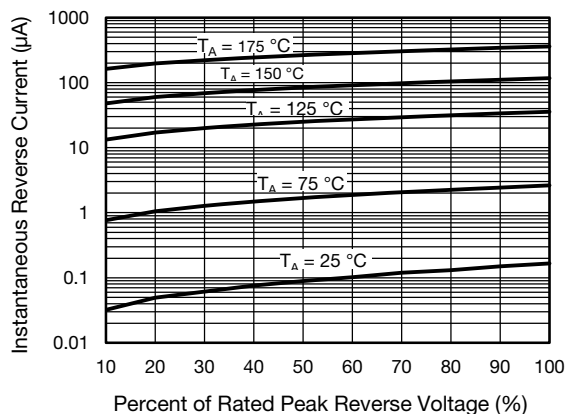


Fig. 4 - Typical Reverse Leakage Characteristics

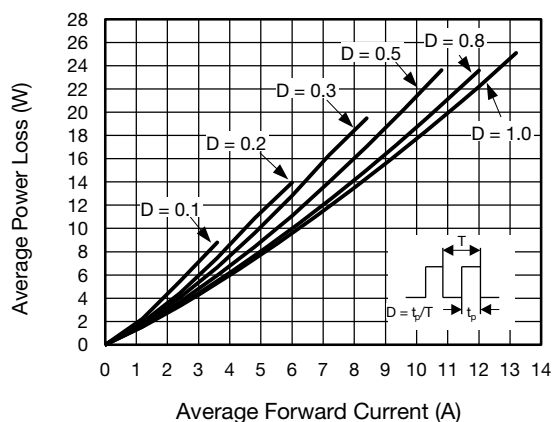


Fig. 2 - Forward Power Loss Characteristics

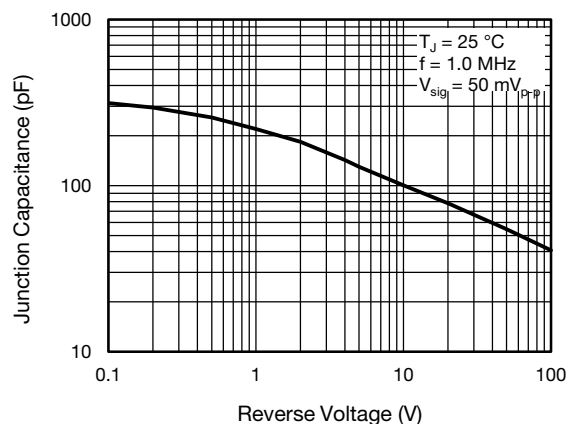


Fig. 5 - Typical Junction Capacitance

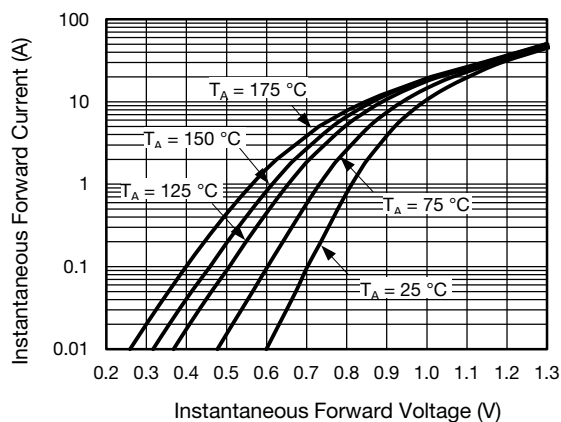


Fig. 3 - Typical Instantaneous Forward Characteristics

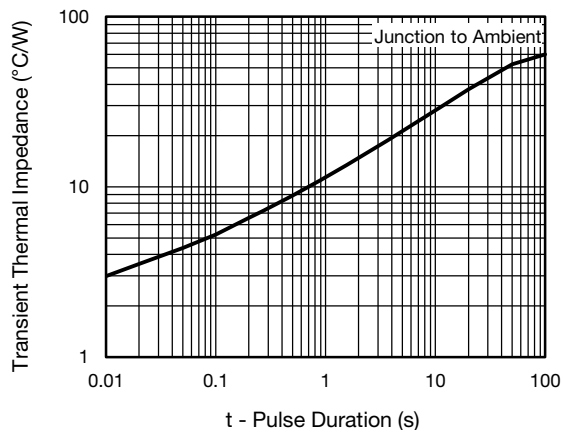
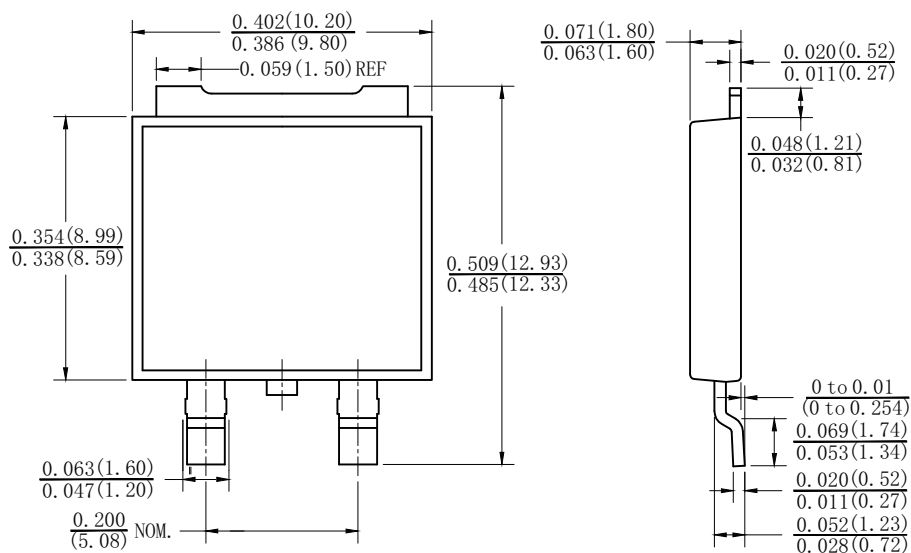


Fig. 6 - Typical Transient Thermal Impedance

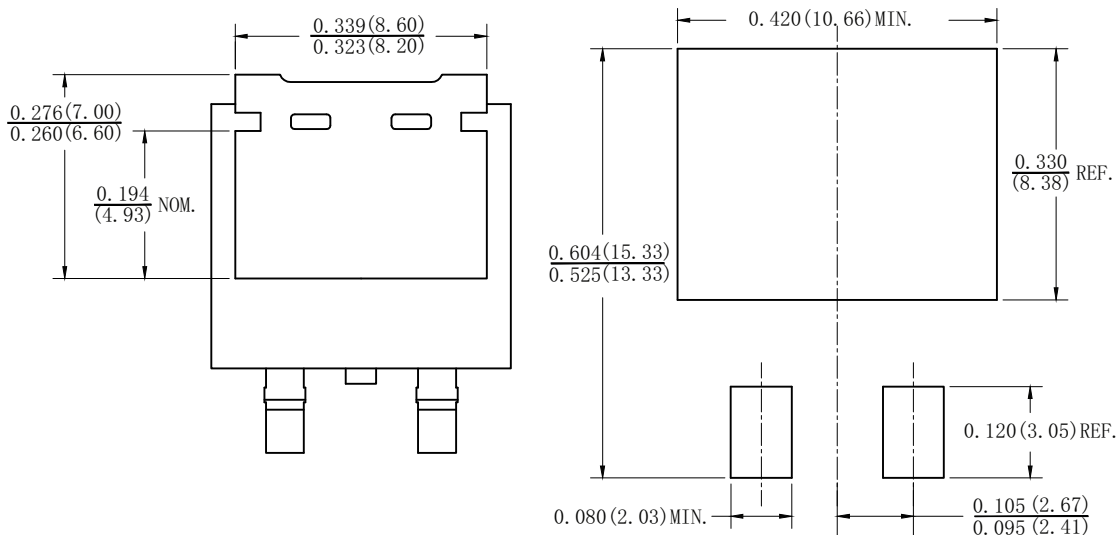


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AC (SMPD)



Mounting Pad Layout





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