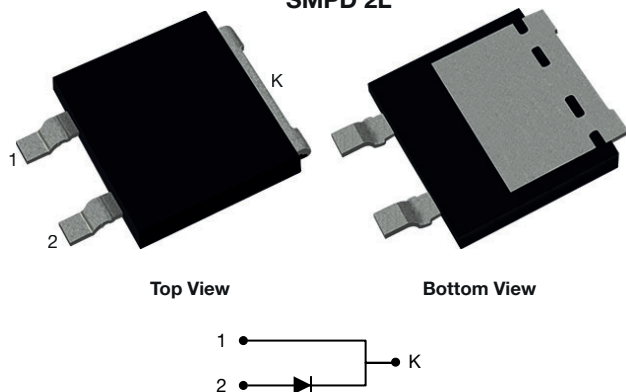


Surface-Mount ESD Capability Rectifiers

eSMP® Series SMPD 2L



FEATURES

- Creepage and clearance distance 3.6 mm minimum
- 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 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?999912

AUTOMOTIVE
GRADE
Available



RoHS
COMPLIANT
HALOGEN
FREE

LINKS TO ADDITIONAL RESOURCES



TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both consumer and automotive on board charger (OBC) applications.

MECHANICAL DATA

Case: SMPD 2L

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and industry 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 | |
|---|--------------|
| $I_{F(AV)}$ | 20 A |
| V_{RRM} | 400 V, 600 V |
| I_{FSM} | 150 A |
| V_F at $I_F = 20$ A ($T_J = 125$ °C) | 1.03 V |
| I_R | 25 μ A |
| T_J max. | 175 °C |
| Package | SMPD 2L |
| Circuit configurations | Single |

| MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted) | | | | |
|---|-----------------------------------|-------------|---------|------|
| PARAMETER | SYMBOL | SE20DTG | SE20DTJ | UNIT |
| Device code | | SE20DTG | SE20DTJ | |
| Maximum repetitive peak reverse voltage | V _{RRM} | 400 | 600 | V |
| Maximum DC forward current | I _F (1) | 20 | | A |
| | I _F (2) | 3.8 | | |
| 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 _J = 25 °C unless otherwise noted) | | | | | | |
|--|--|-------------------------|-------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 10 A | T _J = 25 °C | V _F ⁽¹⁾ | 0.98 | - | V |
| | I _F = 20 A | | | 1.1 | 1.20 | |
| | I _F = 10 A | T _J = 125 °C | | 0.88 | - | |
| | I _F = 20 A | | | 1.03 | 1.15 | |
| Reverse current | Rated V _R | T _J = 25 °C | I _R ⁽²⁾ | - | 25 | μA |
| | | T _J = 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 ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) | | | | |
|--|--------------------------|------|------|----------------------|
| PARAMETER | SYMBOL | TYP. | MAX. | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 60 | 75 | $^{\circ}\text{C/W}$ |
| | $R_{\theta JC}^{(3)}$ | 1.2 | 1.5 | |

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) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint
(3) Thermal resistance junction-to-mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

| 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) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| SE20DTJ-M3/I | 0.52 | I | 2000 / reel | 13" diameter plastic tape and reel |
| SE20DTJHM3/I ⁽¹⁾ | 0.52 | I | 2000 / reel | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified

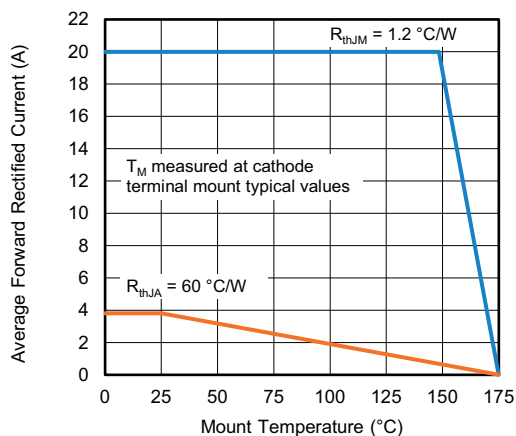
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

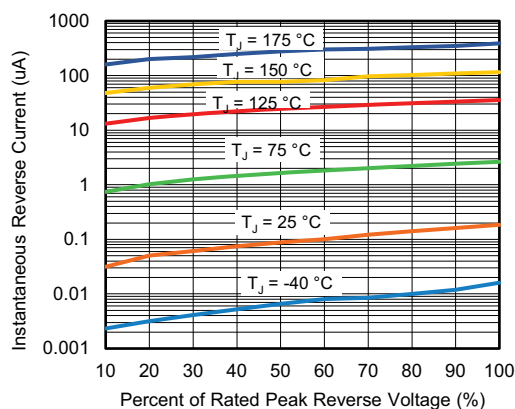


Fig. 4 - Typical Reverse Leakage Characteristics

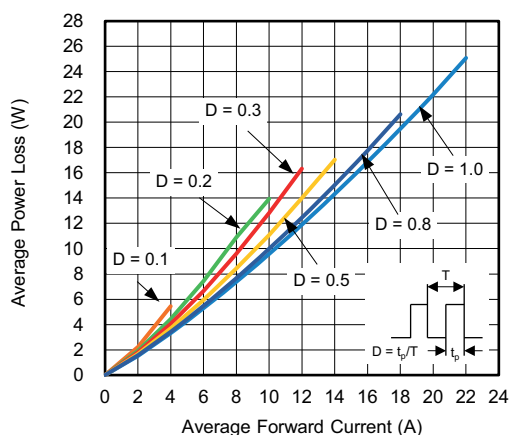


Fig. 2 - Forward Power Loss Characteristics

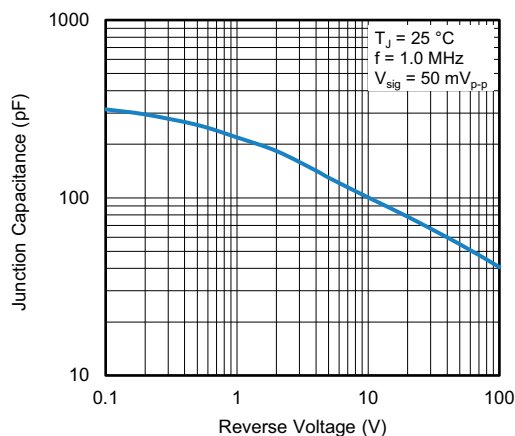


Fig. 5 - Typical Junction Capacitance

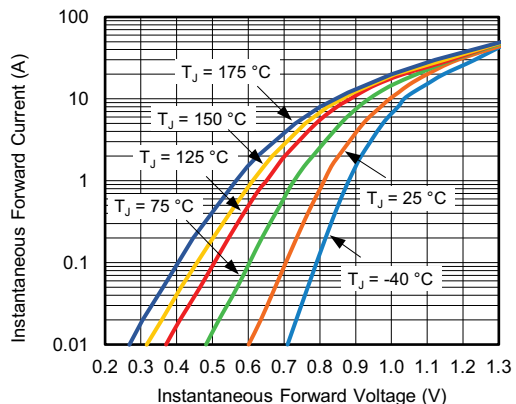


Fig. 3 - Typical Instantaneous Forward Characteristics

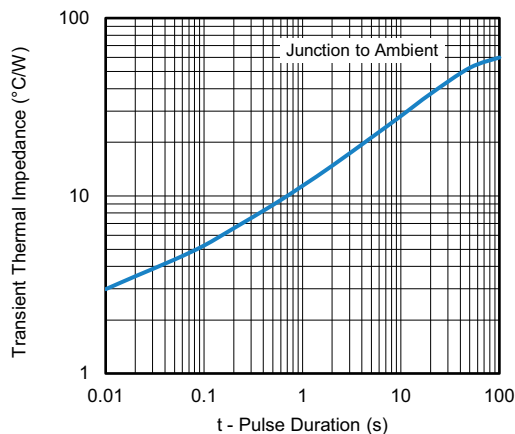
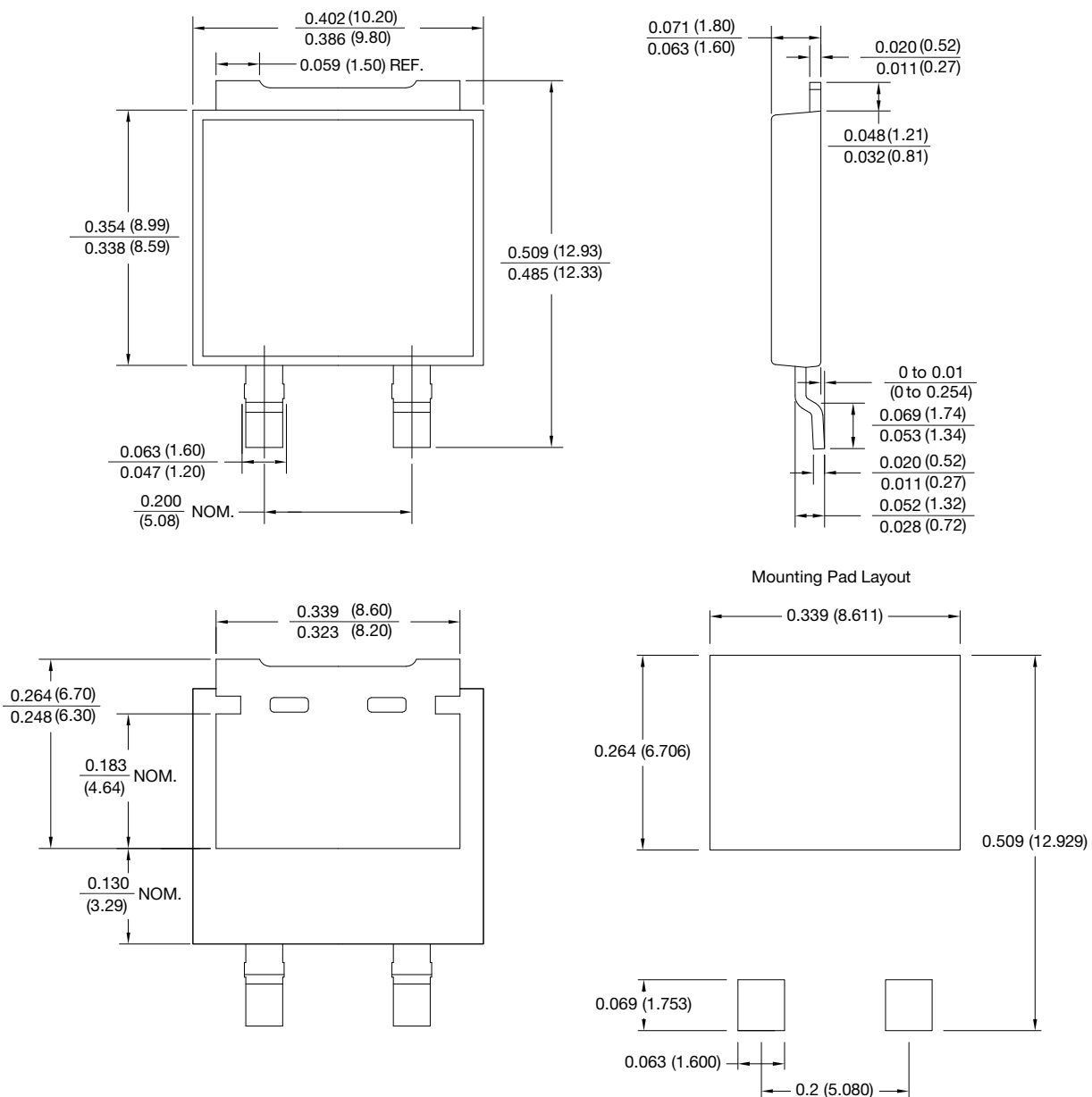


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD 2L



Note

- The suggested mounting pad layout is provided for reference only, as actual pad layouts may vary depending on application



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