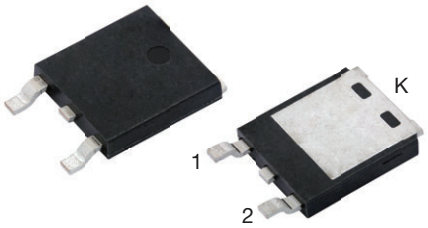
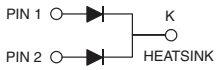
# SE40PWBC, SE40PWDC, SE40PWGC, SE40PWJC

## Surface-Mount ESD Capability Rectifier

eSMP® Series




SlimDPAK (TO-252AE)




### FEATURES

- Very low profile - typical height of 1.3 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

### LINKS TO ADDITIONAL RESOURCES

3D Models

### TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both industry and automotive applications.

### MECHANICAL DATA

**Case:** SlimDPAK (TO-252AE)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant
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 meets JESD 201 class 2 whisker test

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2 x 2 A |
| $V_{RRM}$ | 100 V, 200 V, 400 V, 600 V |
| $I_{FSM}$ | 36 A |
| $V_F$ at $I_F$ = 2 A ($T_A$ = 125 °C) | 0.92 V |
| $T_J$ max. | 175 °C |
| Package | SlimDPAK (TO-252AE) |
| Circuit configuration | Common cathode |

**MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted)

| PARAMETER | | SYMBOL | SE40PWBC | SE40PWDC | SE40PWGC | SE40PWJC | UNIT |
|---|---|---|---|---|---|---|---|
| Device marking code | | | SE40PWBC | SE40PWDC | SE40PWGC | SE40PWJC | |
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 100 | 200 | 400 | 600 | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ (1) | 4 | | | | A |
| | per diode | | 2 | | | | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | | $I_{FSM}$ | 36 | | | | A |
| Operating junction and storage temperature range | | $T_J$, $T_{STG}$ | -55 to +175 | | | | °C |

**Note**

(1) With infinite heatsink

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Maximum Instantaneous forward voltage | $I_F$ = 1.0 A | $T_A$ = 25 °C | $V_F$ (1) | 0.94 | - | V |
| | $I_F$ = 2.0 A | | | 1.01 | 1.10 | |
| | $I_F$ = 1.0 A | $T_A$ = 125 °C | | 0.84 | - | |
| | $I_F$ = 2.0 A | | | 0.92 | 1.01 | |
| Reverse current | Rated $V_R$ | $T_A$ = 25 °C | $I_R$ (2) | - | 10 | µA |
| | | $T_A$ = 125 °C | | 12 | 150 | |
| Typical reverse recovery time | $I_F$ = 0.5 A, $I_R$ = 1.0 A, $I_{rr}$ = 0.25 A | | $t_{rr}$ | 1500 | - | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 14 | - | pF |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | | |
|---|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | SE40PWBC | SE40PWDC | SE40PWGC | SE40PWJC | UNIT |
| Typical thermal resistance per device | $R_{\theta JA}$ (1)(2) | 63 | | | | °C/W |
| | $R_{\theta JM}$ (3) | 2.5 | | | | |

**Notes**

(1) The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

(2) Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction to ambient

(3) Mounted on infinite heat sink; thermal resistance $R_{\theta JM}$ - junction-to-mount

| IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS ($T_A$ = 25 °C unless otherwise noted) | | | | | |
|---|---|---|---|---|---|
| STANDARD | TEST TYPE | TEST CONDITIONS | SYMBOL | CLASS | VALUE |
| AEC-Q101-001 | Human body model (contact mode) | C = 100 pF, R = 1.5 kΩ | $V_C$ | H3B | > 8 kV |

| ORDERING INFORMATION (Example) | | | | |
|---|---|---|---|---|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| SE40PWJC-M3/I | 0.20 | I | 4500 | 13" diameter plastic tape and reel |
| SE40PWJCHM3/I (1) | 0.20 | I | 4500 | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

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

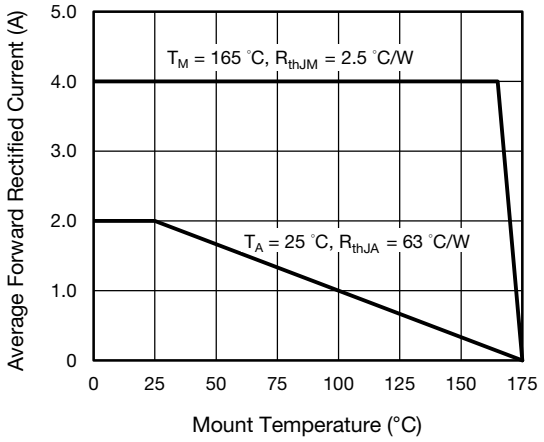



Fig. 1 - Maximum Forward Current Derating Curve

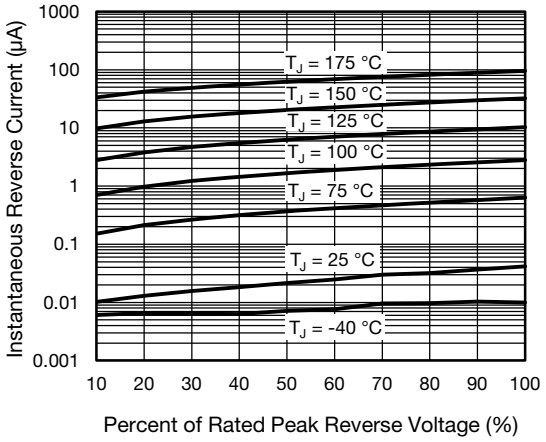



Fig. 4 - Typical Reverse Leakage Characteristics

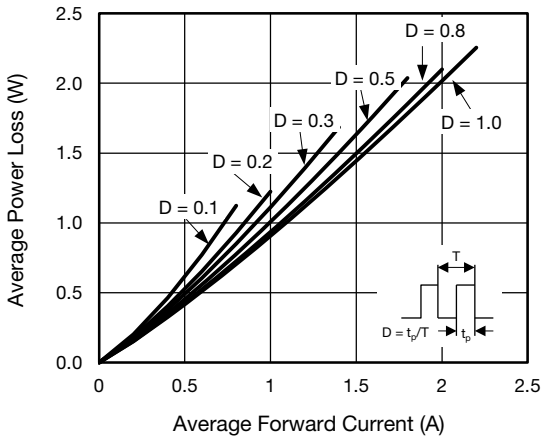



Fig. 2 - Forward Power Loss Characteristics

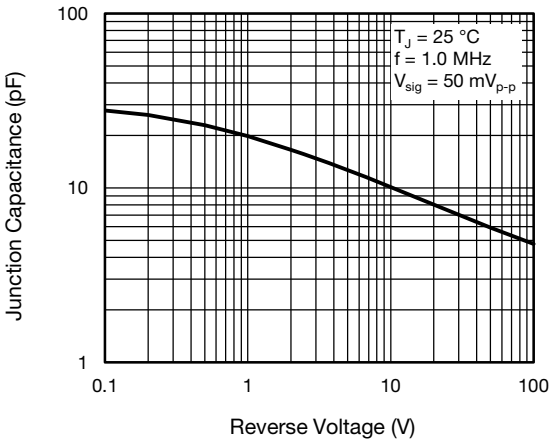



Fig. 5 - Typical Junction Capacitance

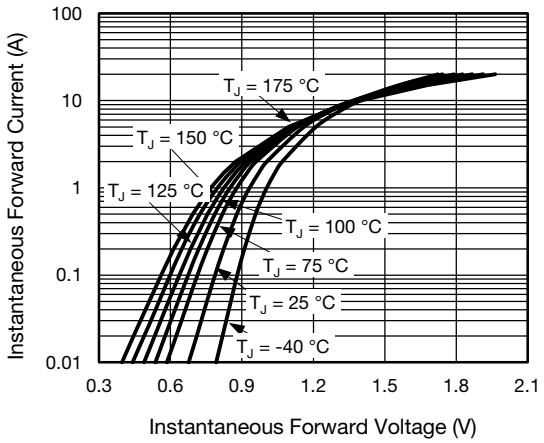



Fig. 3 - Typical Instantaneous Forward Characteristics

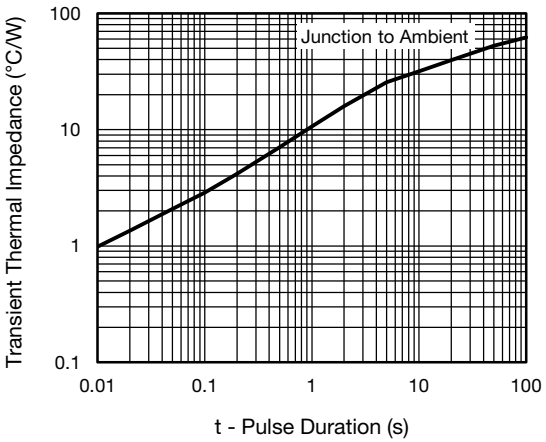
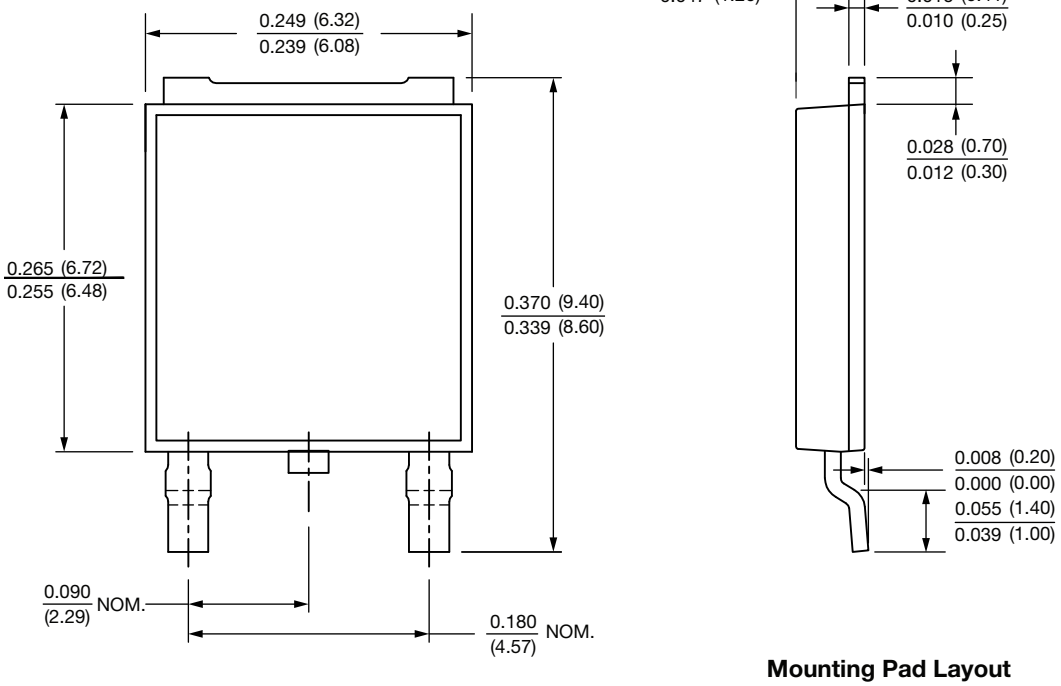


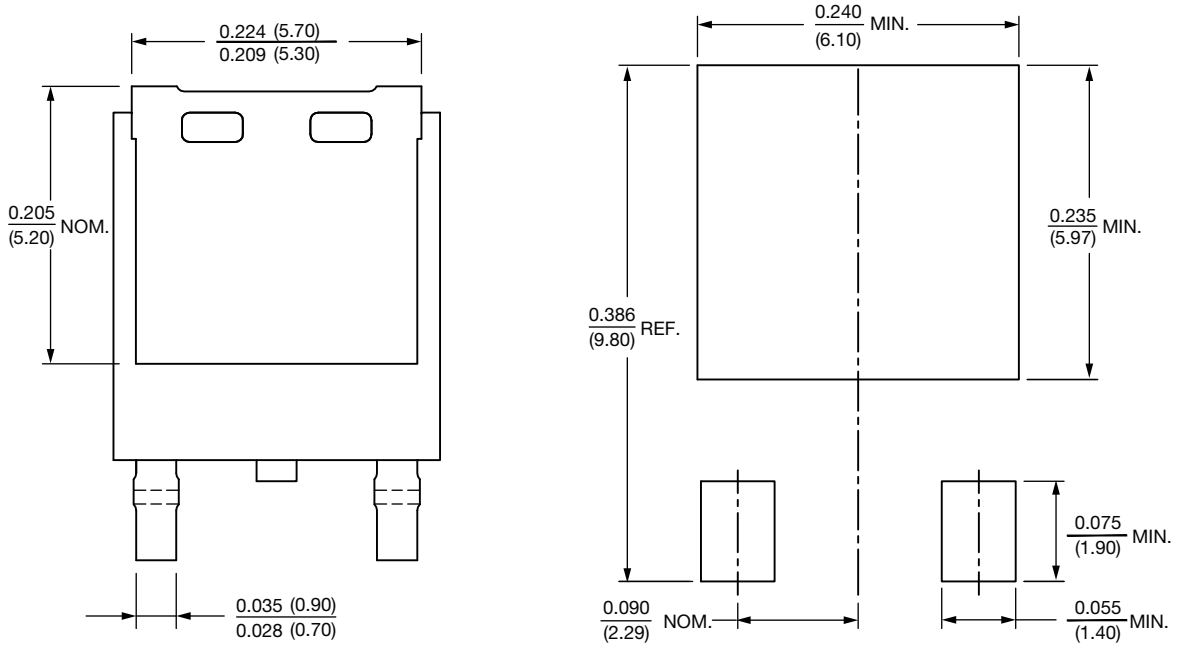

Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SlimDPAK (TO-252AE)**




**Mounting Pad Layout**



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