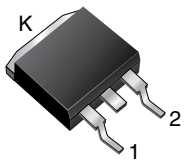
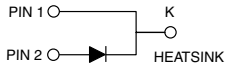
# Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance

**D²PAK (TO-263AB)**




## LINKS TO ADDITIONAL RESOURCES

3D Models

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 16 A |
| $V_{RRM}$ | 35 V, 45 V, 60 V |
| $I_{FSM}$ | 150 A |
| $V_F$ | 0.56 V, 0.62 V |
| $I_R$ | 100 µA |
| $T_J$ max. | 175 °C |
| Package | D²PAK (TO-263AB) |
| Circuit configuration | Single |

## FEATURES

- Power pack
- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHE3_A
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

## TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, and polarity protection application.

## MECHANICAL DATA

**Case:** D²PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating
Base P/NHE3_X - RoHS-compliant, AEC-Q101 qualified ("_X" denotes revision code, e.g. A, B, ...)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** as marked

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

| PARAMETER | SYMBOL | MBRB16H35 | MBRB16H45 | MBRB16H60 | UNIT |
|---|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 35 | 45 | 60 | V |
| Working peak reverse voltage | $V_{RWM}$ | 35 | 45 | 60 | |
| Maximum DC blocking voltage | $V_{DC}$ | 35 | 45 | 60 | |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 16 | | | A |
| Non-repetitive avalanche energy at 25 °C, $I_{AS}$ = 4 A, L = 10 mH | $E_{AS}$ | 80 | | | mJ |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 150 | | | A |
| Peak repetitive reverse surge current at $t_p$ = 2.0 µs, 1 kHz | $I_{RRM}$ | 1.0 | 1.0 | 0.5 | |
| Peak non-repetitive reverse energy (8/20 µs waveform) | $E_{RSM}$ | 20 | | | mJ |
| Electrostatic discharge capacitor voltage Human body model: C = 100 pF, R = 1.5 kΩ | $V_C$ | 25 | | | kV |
| Voltage rate of change (rated $V_R$) | dV/dt | 10 000 | | | V/µs |
| Operating junction and storage temperature range | $T_J$, $T_{STG}$ | -65 to +175 | | | °C |

| ELECTRICAL CHARACTERISTICS ($T_C$ = 25 °C unless otherwise noted) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | | MBRB16H35, MBRB16H45 | | MBRB16H60 | | UNIT |
| | | | | TYP. | MAX. | TYP. | MAX. | |
| Maximum instantaneous forward voltage | $V_F$ (1) | $I_F$ = 16 A | $T_J$ = 25 °C | - | 0.66 | - | 0.73 | V |
| | | $I_F$ = 16 A | $T_J$ = 125 °C | 0.52 | 0.56 | 0.58 | 0.62 | |
| Maximum reverse current | $I_R$ (2) | Rated $V_R$ | $T_J$ = 25 °C | - | 100 | - | 100 | µA |
| | | | $T_J$ = 125 °C | 6.0 | 20 | 4.0 | 20 | mA |

**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 | MBRB16H35, MBRB16H45, MBRB16H60 | UNIT |
| Typical thermal resistance, junction to case | $R_{\theta JC}$ | 1.5 | °C/W |

| ORDERING INFORMATION (Example) | | | | | |
|---|---|---|---|---|---|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB | MBRB16H60HE3_B/P (1) | 1.33 | P | 50/tube | Tube |
| TO-263AB | MBRB16H60HE3_B/I (1) | 1.33 | I | 800/reel | Tape and reel |

**Note**

(1) AEC-Q101 qualified

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

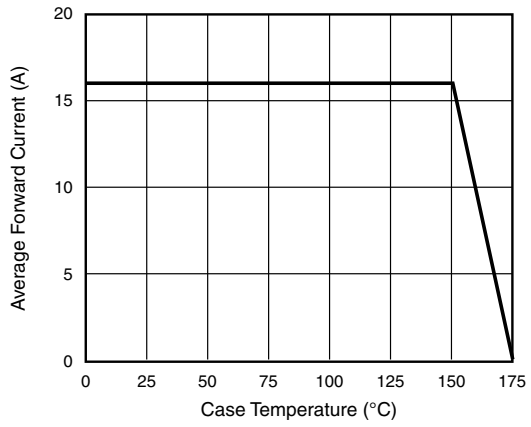



Fig. 1 - Forward Current Derating Curve

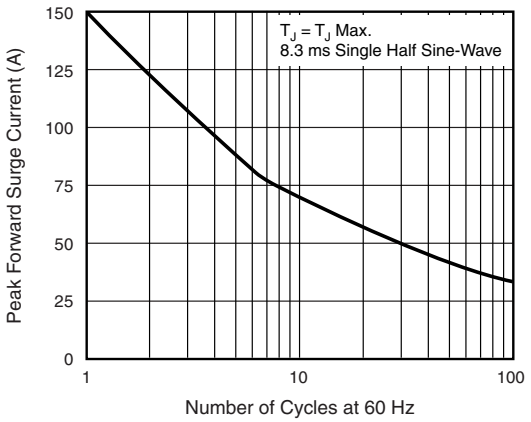



Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

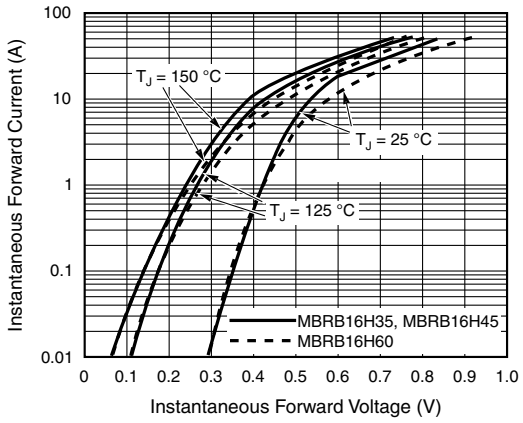



Fig. 3 - Typical Instantaneous Forward Characteristics

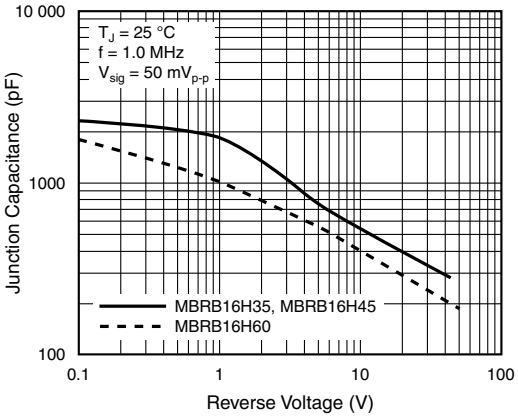



Fig. 5 - Typical Junction Capacitance

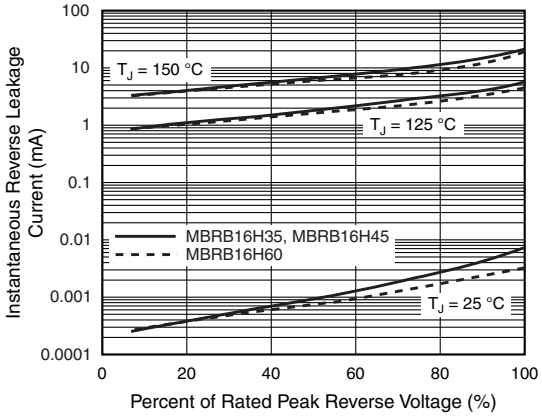



Fig. 4 - Typical Reverse Characteristics

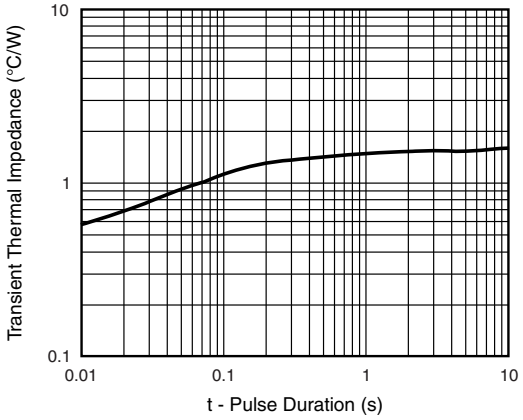
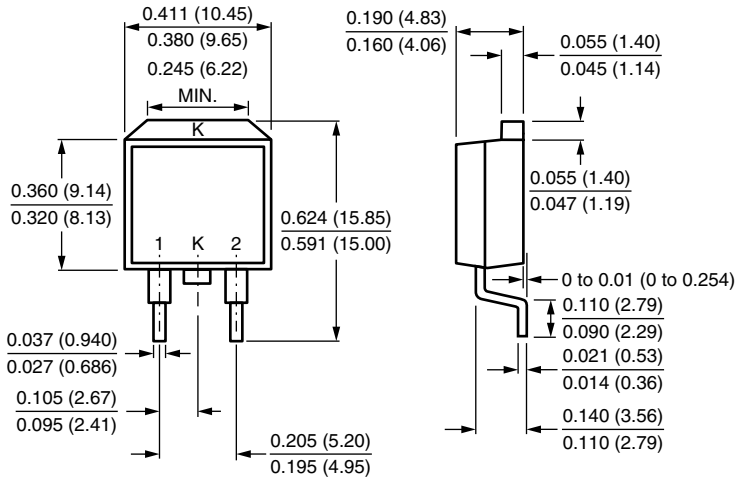


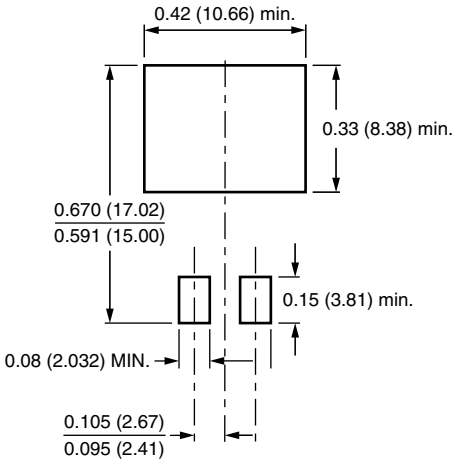

Fig. 6 - Typical Transient Thermal Impedance

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

### D²PAK (TO-263AB)




### Mounting Pad Layout



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