

## 10A, 35V - 150V Schottky Barrier Surface Mount Rectifier

### FEATURES

- AEC-Q101 qualified
- Low power loss, high efficiency
- Ideal for automated placement
- Guard ring for overvoltage protection
- High surge current capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

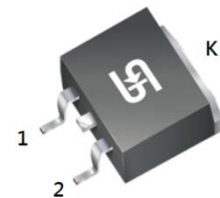
### APPLICATIONS

- Low voltage, high freq. inverter
- DC/DC converter
- Freewheeling diodes
- Reverse battery protection
- Car lighting

### MECHANICAL DATA

- Case: TO-263AB (D<sup>2</sup>PAK)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 1.37g (approximately)

| KEY PARAMETERS |                               |      |
|----------------|-------------------------------|------|
| PARAMETER      | VALUE                         | UNIT |
| $I_F$          | 10                            | A    |
| $V_{RRM}$      | 35 - 150                      | V    |
| $I_{FSM}$      | 120                           | A    |
| $T_{JMAX}$     | 175                           | °C   |
| Package        | TO-263AB (D <sup>2</sup> PAK) |      |
| Configuration  | Single die                    |      |


**TO-263AB (D<sup>2</sup>PAK)**


| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)              |              |                   |                   |                   |                   |                   |                    |                    |                  |
|------------------------------------------------------------------------------------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|------------------|
| PARAMETER                                                                                | SYMBOL       | MBRS<br>1035<br>H | MBRS<br>1045<br>H | MBRS<br>1050<br>H | MBRS<br>1060<br>H | MBRS<br>1090<br>H | MBRS<br>10100<br>H | MBRS<br>10150<br>H | UNIT             |
| Marking code on the device                                                               |              | MBRS<br>1035      | MBRS<br>1045      | MBRS<br>1050      | MBRS<br>1060      | MBRS<br>1090      | MBRS<br>10100      | MBRS<br>10150      |                  |
| Repetitive peak reverse voltage                                                          | $V_{RRM}$    | 35                | 45                | 50                | 60                | 90                | 100                | 150                | V                |
| Reverse voltage, total rms value                                                         | $V_{R(RMS)}$ | 24                | 31                | 35                | 42                | 63                | 70                 | 105                | V                |
| Forward current                                                                          | $I_F$        | 10                |                   |                   |                   |                   |                    |                    | A                |
| Surge peak forward current,<br>8.3ms single half sine wave<br>superimposed on rated load | $I_{FSM}$    | 120               |                   |                   |                   |                   |                    |                    | A                |
| Peak repetitive reverse surge<br>current <sup>(1)</sup>                                  | $I_{RRM}$    | 1                 |                   |                   | 0.5               |                   |                    |                    | A                |
| Critical rate of rise of off-state<br>voltage                                            | dv/dt        | 10,000            |                   |                   |                   |                   |                    |                    | V/ $\mu\text{s}$ |
| Junction temperature                                                                     | $T_J$        | -55 to +175       |                   |                   |                   |                   |                    |                    | °C               |
| Storage temperature                                                                      | $T_{STG}$    | -55 to +175       |                   |                   |                   |                   |                    |                    | °C               |

#### Notes:

1.  $t_p = 2.0\mu\text{s}$ , 1.0KHz

| <b>THERMAL PERFORMANCE</b>          |                 |            |             |
|-------------------------------------|-----------------|------------|-------------|
| <b>PARAMETER</b>                    | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b> |
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 2          | °C/W        |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                         |                                             |               |            |            |             |
|-------------------------------------------------------------------------------------|-------------------------|---------------------------------------------|---------------|------------|------------|-------------|
| <b>PARAMETER</b>                                                                    |                         | <b>CONDITIONS</b>                           | <b>SYMBOL</b> | <b>TYP</b> | <b>MAX</b> | <b>UNIT</b> |
| Forward voltage <sup>(1)</sup>                                                      | MBRS1035H<br>MBRS1045H  | $I_F = 10\text{A}, T_J = 25^\circ\text{C}$  | $V_F$         | -          | -          | V           |
|                                                                                     | MBRS1050H<br>MBRS1060H  |                                             |               | -          | 0.80       | V           |
|                                                                                     | MBRS1090H<br>MBRS10100H |                                             |               | -          | 0.85       | V           |
|                                                                                     | MBRS10150H              |                                             |               | -          | 1.05       | V           |
|                                                                                     | MBRS1035H<br>MBRS1045H  | $I_F = 20\text{A}, T_J = 25^\circ\text{C}$  |               | -          | 0.84       | V           |
|                                                                                     | MBRS1050H<br>MBRS1060H  |                                             |               | -          | 0.95       | V           |
|                                                                                     | MBRS1090H<br>MBRS10100H |                                             |               | -          | -          | V           |
|                                                                                     | MBRS10150H              |                                             |               | -          | -          | V           |
|                                                                                     | MBRS1035H<br>MBRS1045H  | $I_F = 10\text{A}, T_J = 125^\circ\text{C}$ |               | -          | 0.57       | V           |
|                                                                                     | MBRS1050H<br>MBRS1060H  |                                             |               | -          | 0.70       | V           |
|                                                                                     | MBRS1090H<br>MBRS10100H |                                             |               | -          | 0.71       | V           |
|                                                                                     | MBRS10150H              |                                             |               | -          | -          | V           |
|                                                                                     | MBRS1035H<br>MBRS1045H  | $I_F = 20\text{A}, T_J = 125^\circ\text{C}$ |               | -          | 0.72       | V           |
|                                                                                     | MBRS1050H<br>MBRS1060H  |                                             |               | -          | 0.85       | V           |
|                                                                                     | MBRS1090H<br>MBRS10100H |                                             |               | -          | -          | V           |
|                                                                                     | MBRS10150H              |                                             |               | -          | -          | V           |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                                                                                           |                           |               |            |            |               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------|---------------|------------|------------|---------------|
| <b>PARAMETER</b>                                                                    |                                                                                           | <b>CONDITIONS</b>         | <b>SYMBOL</b> | <b>TYP</b> | <b>MAX</b> | <b>UNIT</b>   |
| Reverse current<br>@ rated $V_R^{(2)}$                                              | MBRS1035H<br>MBRS1045H<br>MBRS1050H<br>MBRS1060H<br>MBRS1090H<br>MBRS10100H<br>MBRS10150H | $T_J = 25^\circ\text{C}$  | $I_R$         | -          | 100        | $\mu\text{A}$ |
|                                                                                     | MBRS1035H<br>MBRS1045H                                                                    | $T_J = 100^\circ\text{C}$ |               | -          | 15         | mA            |
|                                                                                     | MBRS1050H<br>MBRS1060H                                                                    |                           |               | -          | 10         | mA            |
|                                                                                     | MBRS1090H<br>MBRS10100H<br>MBRS10150H                                                     |                           |               | -          | -          | mA            |
|                                                                                     | MBRS1035H<br>MBRS1045H<br>MBRS1050H<br>MBRS1060H                                          | $T_J = 125^\circ\text{C}$ |               | -          | -          | mA            |
|                                                                                     | MBRS1090H<br>MBRS10100H<br>MBRS10150H                                                     |                           |               | -          | 5          | mA            |

**Notes:**

1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

| <b>ORDERING INFORMATION</b>        |                               |                   |
|------------------------------------|-------------------------------|-------------------|
| <b>ORDERING CODE<sup>(1)</sup></b> | <b>PACKAGE</b>                | <b>PACKING</b>    |
| MBRS10xH                           | TO-263AB (D <sup>2</sup> PAK) | 800 / Tape & Reel |

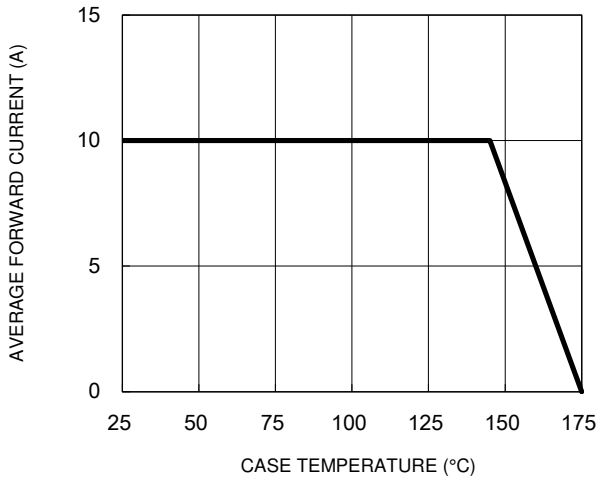
**Notes:**

1. "x" defines voltage from 35V(MBRS1035H) to 150V(MBRS10150H)

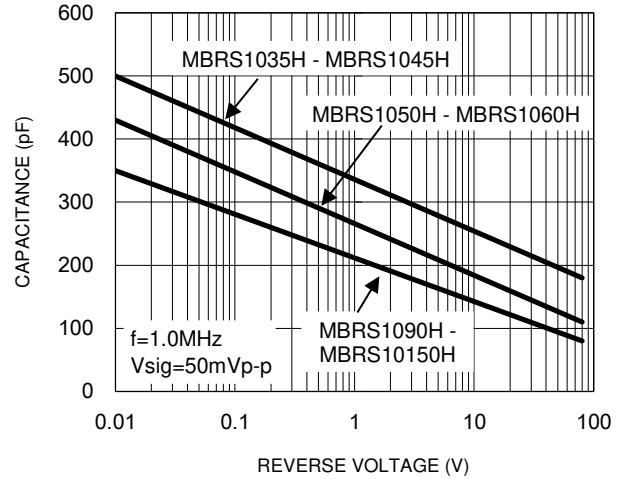
**CHARACTERISTICS CURVES**

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

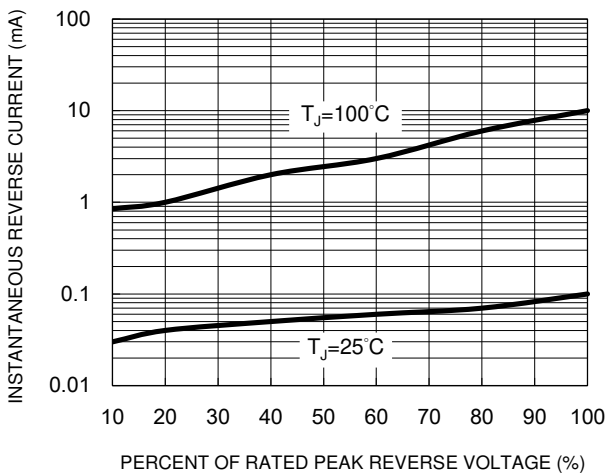
**Fig.1 Forward Current Derating Curve**



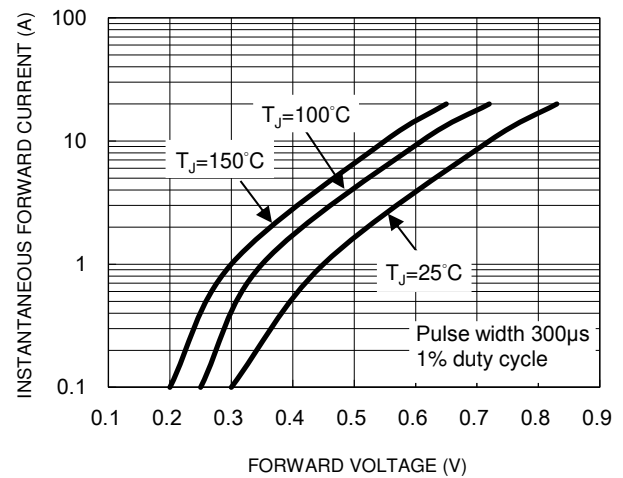
**Fig.2 Typical Junction Capacitance**



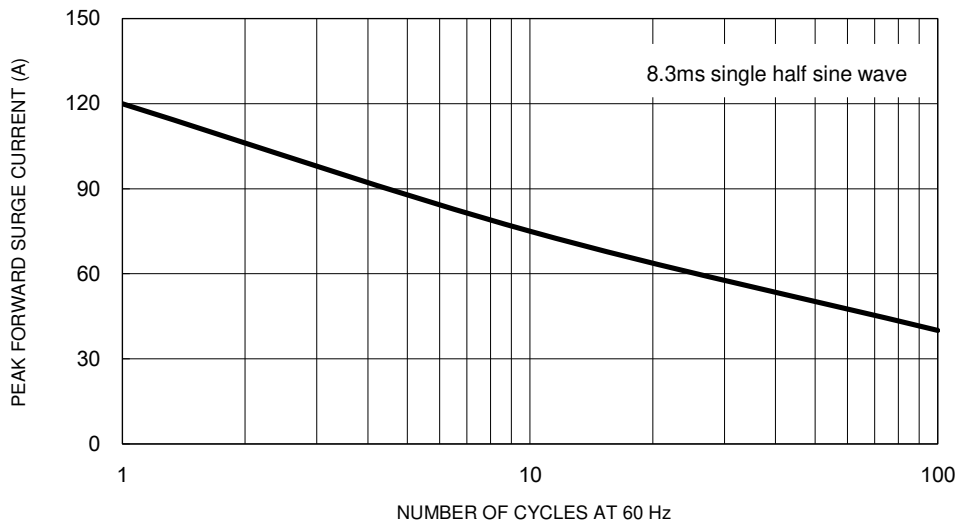
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



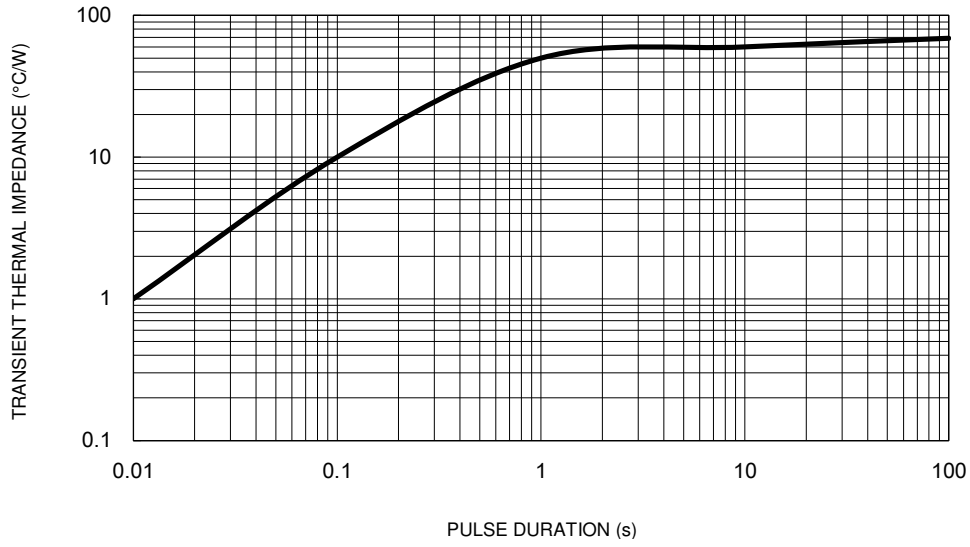
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



**CHARACTERISTICS CURVES**

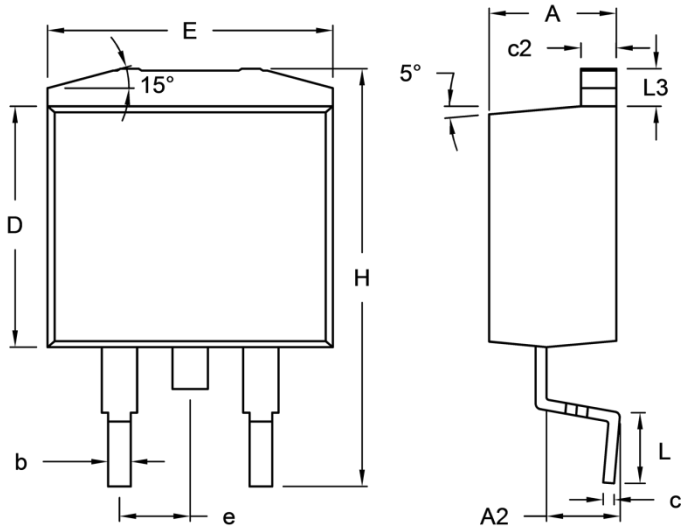
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.6 Typical Transient Thermal Impedance**



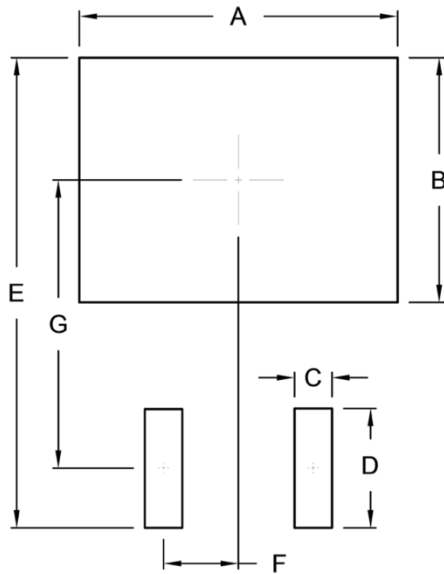
**PACKAGE OUTLINE DIMENSIONS**

TO-263AB (D<sup>2</sup>PAK)



| DIM. | Unit (mm) |       | Unit (inch) |       |
|------|-----------|-------|-------------|-------|
|      | Min.      | Max.  | Min.        | Max.  |
| A    | 4.44      | 4.70  | 0.175       | 0.185 |
| A2   | 2.03      | 2.79  | 0.080       | 0.110 |
| b    | 0.68      | 0.94  | 0.027       | 0.037 |
| c    | 0.36      | 0.53  | 0.014       | 0.021 |
| c2   | 1.14      | 1.40  | 0.045       | 0.055 |
| D    | 8.25      | 9.25  | 0.325       | 0.364 |
| E    | -         | 10.50 | -           | 0.413 |
| e    | 2.41      | 2.67  | 0.095       | 0.105 |
| H    | 14.60     | 15.88 | 0.575       | 0.625 |
| L    | 2.29      | 2.79  | 0.090       | 0.110 |
| L3   | 1.14      | 1.40  | 0.045       | 0.055 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 10.80     | 0.425       |
| B      | 8.30      | 0.327       |
| C      | 1.27      | 0.050       |
| D      | 4.05      | 0.159       |
| E      | 15.95     | 0.628       |
| F      | 2.54      | 0.100       |
| G      | 9.775     | 0.385       |

**MARKING DIAGRAM**



- P/N = Marking Code
- G = Green Compound
- YWW = Date Code
- F = Factory Code

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