

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

### FEATURES

- 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

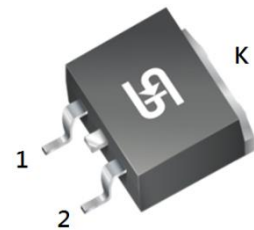
### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- DC to DC converters

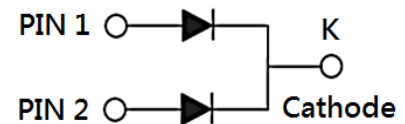
### MECHANICAL DATA

- 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    |
| $T_{JMAX}$     | 150                           | °C   |
| Package        | TO-263AB (D <sup>2</sup> PAK) |      |
| Configuration  | Dual dies                     |      |



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



| ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C unless otherwise noted)            |              |                    |                    |                    |                    |                    |                     |                     |      |
|--|--------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|------|
| PARAMETER  | SYMBOL       | MBRS<br>1035<br>CT | MBRS<br>1045<br>CT | MBRS<br>1050<br>CT | MBRS<br>1060<br>CT | MBRS<br>1090<br>CT | MBRS<br>10100<br>CT | MBRS<br>10150<br>CT | UNIT |
| Marking code on the device   |              | MBRS<br>1035CT     | MBRS<br>1045CT     | MBRS<br>1050CT     | MBRS<br>1060CT     | MBRS<br>1090CT     | MBRS<br>10100CT     | MBRS<br>10150CT     |      |
| 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, 8.3ms single half sine wave superimposed on rated load | $I_{FSM}$    | 120                |                    |                    |                    |                    |                     |                     | A    |
| Peak repetitive reverse surge current <sup>(1)</sup>                               | $I_{RRM}$    | 1                  |                    |                    |                    |                    |                     |                     | A    |
| Peak repetitive forward current (Rated V <sub>R</sub> , Square wave, 20KHz)        | $I_{FRM}$    | 10                 |                    |                    |                    |                    |                     |                     | A    |
| Critical rate of rise of off-state voltage   | dv/dt        | 10,000             |                    |                    |                    |                    |                     |                     | V/μs |

#### Notes:

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

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                  |                    |                    |                    |                    |                    |                     |                     |                  |
|--|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|------------------|
| PARAMETER  | SYMBOL           | MBRS<br>1035<br>CT | MBRS<br>1045<br>CT | MBRS<br>1050<br>CT | MBRS<br>1060<br>CT | MBRS<br>1090<br>CT | MBRS<br>10100<br>CT | MBRS<br>10150<br>CT | UNIT             |
| Junction temperature   | $T_J$            | -55 to +150        |                    |                    |                    |                    |                     |                     | $^\circ\text{C}$ |
| Storage temperature  | $T_{\text{STG}}$ | -55 to +150        |                    |                    |                    |                    |                     |                     | $^\circ\text{C}$ |

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

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |             |  |        |      |      |      |
|---|-------------|--|--------|------|------|------|
| PARAMETER   |             | CONDITIONS                                 | SYMBOL | TYP  | MAX  | UNIT |
| Forward voltage per diode <sup>(1)</sup>  | MBRS1035CT  | $I_F = 5\text{A}, T_J = 25^\circ\text{C}$  | $V_F$  | -    | 0.70 | V    |
|   | MBRS1045CT  |  |        | -    | 0.80 | V    |
|   | MBRS1050CT  |  |        | -    | 0.85 | V    |
|   | MBRS1060CT  |  |        | -    | 0.88 | V    |
|   | MBRS1090CT  |  |        | -    | 0.80 | V    |
|   | MBRS10100CT | -  |        | 0.90 | V    |      |
|   | MBRS10150CT | -  |        | 0.95 | V    |      |
|   | MBRS1035CT  | $I_F = 10\text{A}, T_J = 25^\circ\text{C}$ |        | -    | 0.98 | V    |
|   | MBRS1045CT  |  |        | -    | 0.57 | V    |
|   | MBRS1050CT  |  |        | -    | 0.65 | V    |
|   | MBRS1060CT  |  |        | -    | 0.75 | V    |
|   | MBRS1090CT  |  |        | -    | 0.78 | V    |
|   | MBRS10100CT | -  |        | 0.67 | V    |      |
|   | MBRS10150CT | -  |        | 0.75 | V    |      |
|   | MBRS1035CT  | $I_F = 5\text{A}, T_J = 125^\circ\text{C}$ |        | -    | 0.85 | V    |
|   | MBRS1045CT  |  |        | -    | 0.88 | V    |
|   | MBRS1050CT  |  |        | -    | 0.67 | V    |
|   | MBRS1060CT  |  |        | -    | 0.75 | V    |
| MBRS1090CT  | -           |  | 0.85   | V    |      |      |
| MBRS10100CT   | -           | 0.88                                       | V      |      |      |      |
| MBRS10150CT   | -           | 0.88                                       | 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 @ rated $V_R$ per diode <sup>(2)</sup>                              | MBRS1035CT<br>MBRS1045CT<br>MBRS1050CT<br>MBRS1060CT<br>MBRS1090CT<br>MBRS10100CT<br>MBRS10150CT | $T_J = 25^\circ\text{C}$  | $I_R$         | -          | 100        | $\mu\text{A}$ |
|   | MBRS1035CT<br>MBRS1045CT   | $T_J = 100^\circ\text{C}$ |               | -          | 15         | mA            |
|   | MBRS1050CT<br>MBRS1060CT   |                           |               | -          | 10         | mA            |
|   | MBRS1090CT<br>MBRS10100CT<br>MBRS10150CT   |                           |               | -          | -          | mA            |
|   | MBRS1035CT<br>MBRS1045CT<br>MBRS1050CT<br>MBRS1060CT   | $T_J = 125^\circ\text{C}$ |               | -          | -          | mA            |
|   | MBRS1090CT<br>MBRS10100CT<br>MBRS10150CT   |                           |               | -          | 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>    |
| MBRS10xCT                          | TO-263AB (D <sup>2</sup> PAK) | 800 / Tape & Reel |

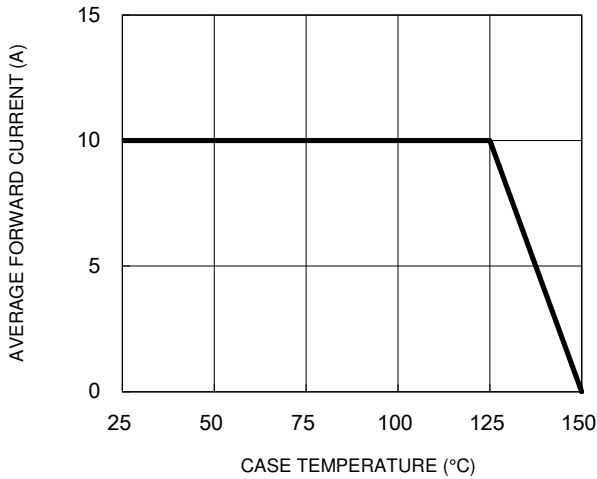
**Notes:**

1. "x" defines voltage from 35V(MBRS1035CT) to 150V(MBRS10150CT)

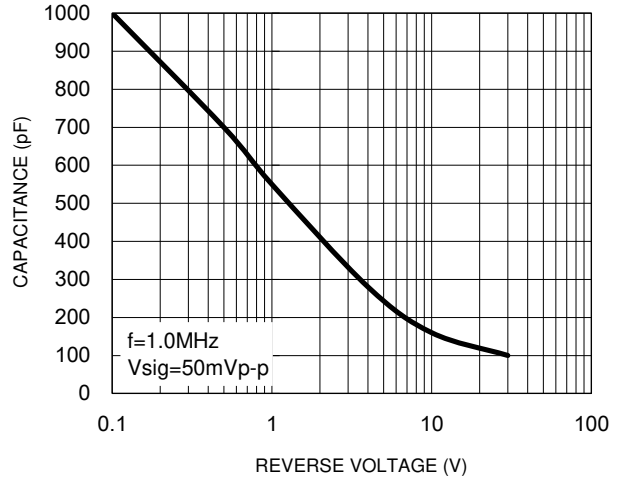
**CHARACTERISTICS CURVES**

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

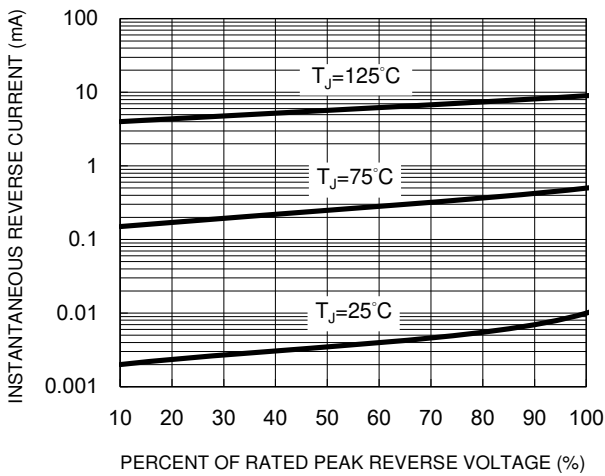
**Fig.1 Forward Current Derating Curve**



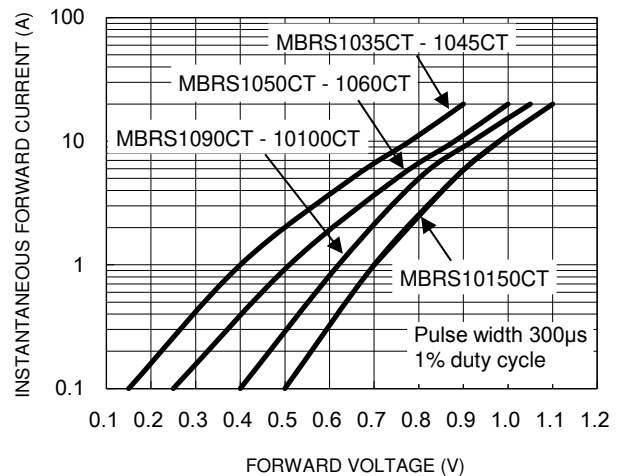
**Fig.2 Typical Junction Capacitance**



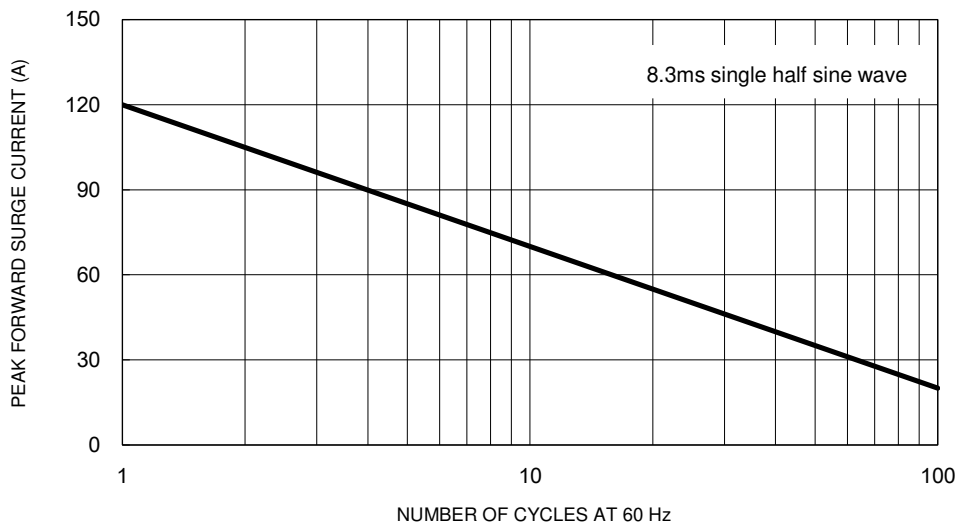
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



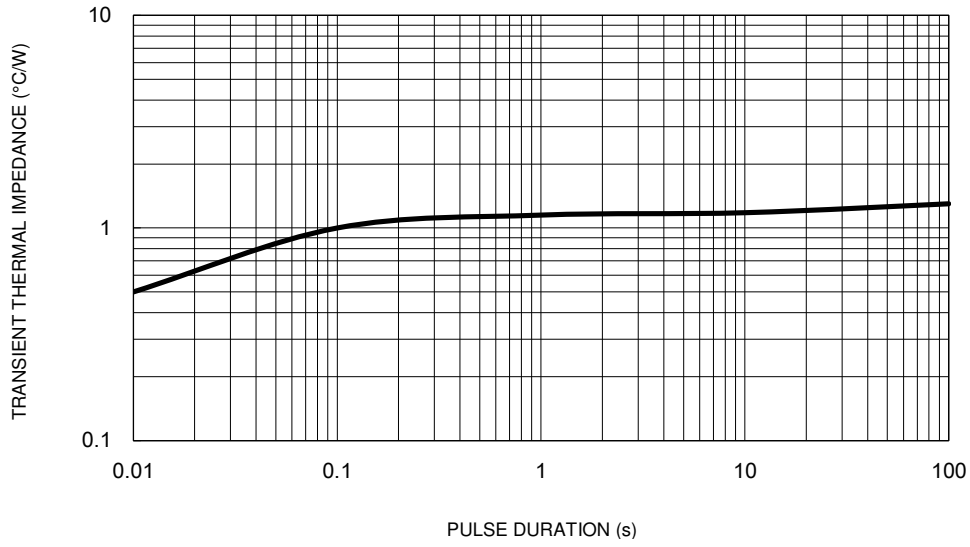
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



**CHARACTERISTICS CURVES**

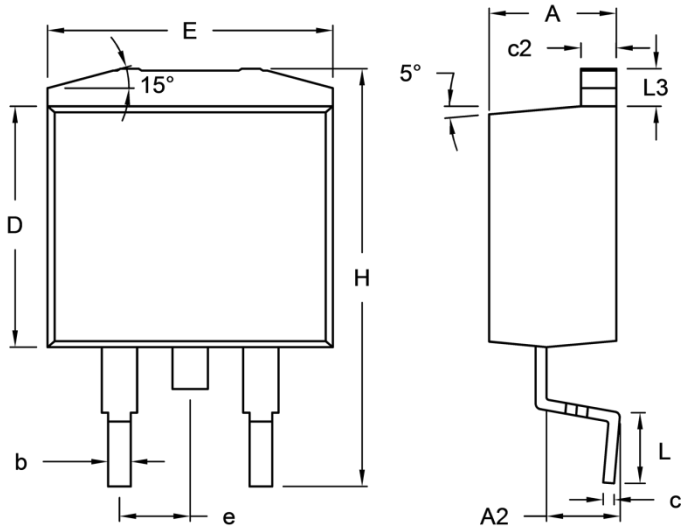
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.6 Typical Transient Thermal Impedance**



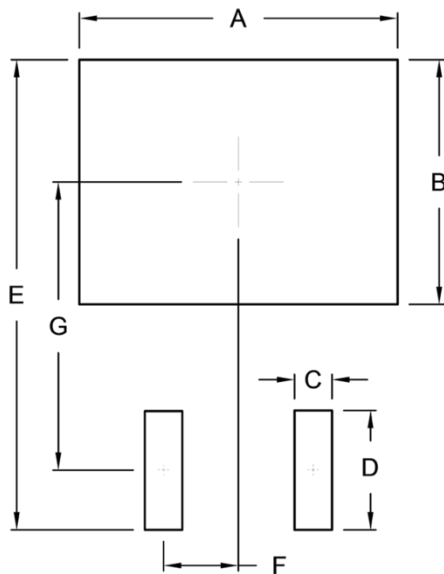
**PACKAGE OUTLINE DIMENSIONS**

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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