

## 20A, 100V - 200V 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

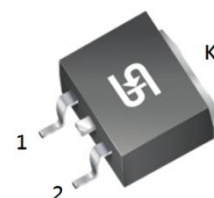
### APPLICATIONS

- 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: 1.40g (approximately)

| KEY PARAMETERS |                               |      |
|----------------|-------------------------------|------|
| PARAMETER      | VALUE                         | UNIT |
| $I_F$          | 20                            | A    |
| $V_{RRM}$      | 100 - 200                     | V    |
| $I_{FSM}$      | 150                           | A    |
| $T_{J\ MAX}$   | 175                           | °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>20H100CT<br>H | MBRS<br>20H150CT<br>H | MBRS<br>20H200CT<br>H | UNIT |
| Marking code on the device                                                         |                     | MBRS<br>20H100CT      | MBRS<br>20H150CT      | MBRS<br>20H200CT      |      |
| Repetitive peak reverse voltage                                                    | V <sub>RRM</sub>    | 100                   | 150                   | 200                   | V    |
| Reverse voltage, total rms value                                                   | V <sub>R(RMS)</sub> | 70                    | 105                   | 140                   | V    |
| Forward current                                                                    | I <sub>F</sub>      | 20                    |                       |                       | A    |
| Surge peak forward current, 8.3ms single half sine wave superimposed on rated load | I <sub>FSM</sub>    | 150                   |                       |                       | A    |
| Peak repetitive forward current (Rated V <sub>R</sub> , Square wave, 20KHz)        | I <sub>FRM</sub>    | 20                    |                       |                       | A    |
| Peak repetitive reverse surge current <sup>(1)</sup>                               | I <sub>RRM</sub>    | 1                     | 0.5                   |                       | A    |
| Critical rate of rise of off-state voltage                                         | dv/dt               | 10,000                |                       |                       | V/μs |
| Junction temperature                                                               | T <sub>J</sub>      | -55 to +175           |                       |                       | °C   |
| Storage temperature                                                                | T <sub>STG</sub>    | -55 to +175           |                       |                       | °C   |

#### Notes:

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

**THERMAL PERFORMANCE**

| PARAMETER                           | SYMBOL          | TYP | UNIT |
|-------------------------------------|-----------------|-----|------|
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 1.5 | °C/W |

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

| PARAMETER                                                       |                                | CONDITIONS                                   | SYMBOL         | TYP | MAX  | UNIT |
|-----------------------------------------------------------------|--------------------------------|----------------------------------------------|----------------|-----|------|------|
| Forward voltage per diode <sup>(1)</sup>                        | MBRS20H100CTH                  | I <sub>F</sub> = 10A, T <sub>J</sub> = 25°C  | V <sub>F</sub> | -   | 0.85 | V    |
|                                                                 | MBRS20H150CTH<br>MBRS20H200CTH |                                              |                | -   | 0.88 | V    |
|                                                                 | MBRS20H100CTH                  | I <sub>F</sub> = 20A, T <sub>J</sub> = 25°C  |                | -   | 0.95 | V    |
|                                                                 | MBRS20H150CTH<br>MBRS20H200CTH |                                              |                | -   | 0.97 | V    |
|                                                                 | MBRS20H100CTH                  | I <sub>F</sub> = 10A, T <sub>J</sub> = 125°C |                | -   | 0.75 | V    |
|                                                                 | MBRS20H150CTH<br>MBRS20H200CTH |                                              |                | -   | 0.75 | V    |
|                                                                 | MBRS20H100CTH                  | I <sub>F</sub> = 20A, T <sub>J</sub> = 125°C |                | -   | 0.85 | V    |
|                                                                 | MBRS20H150CTH<br>MBRS20H200CTH |                                              |                | -   | 0.85 | V    |
| Reverse current @ rated V <sub>R</sub> per diode <sup>(2)</sup> |                                | T <sub>J</sub> = 25°C                        | I <sub>R</sub> | -   | 5    | μA   |
|                                                                 |                                | T <sub>J</sub> = 125°C                       |                | -   | 2    | mA   |

**Notes:**

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

**ORDERING INFORMATION**

| ORDERING CODE <sup>(1)</sup> | PACKAGE                       | PACKING           |
|------------------------------|-------------------------------|-------------------|
| MBRS20HxCTH                  | TO-263AB (D <sup>2</sup> PAK) | 800 / Tape & Reel |

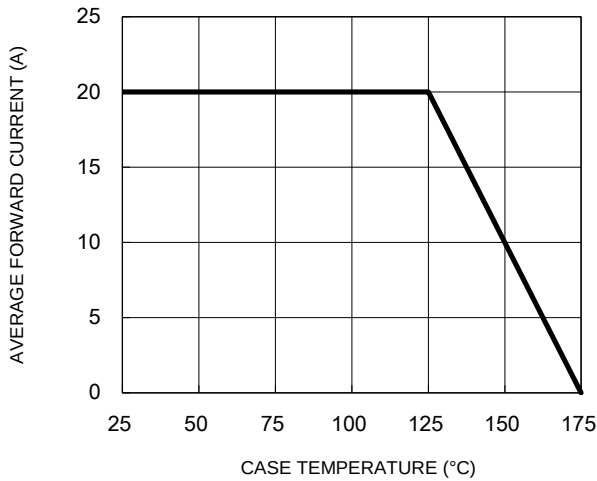
**Notes:**

1. "x" defines voltage from 100V(MBRS20H100CTH) to 200V(MBRS20H200CTH)

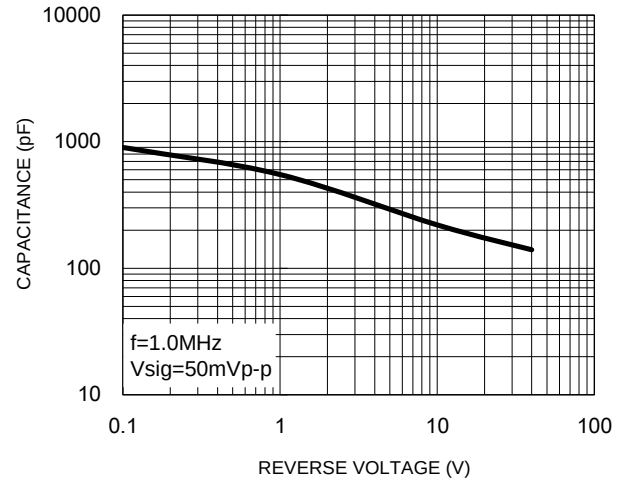
## CHARACTERISTICS CURVES

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

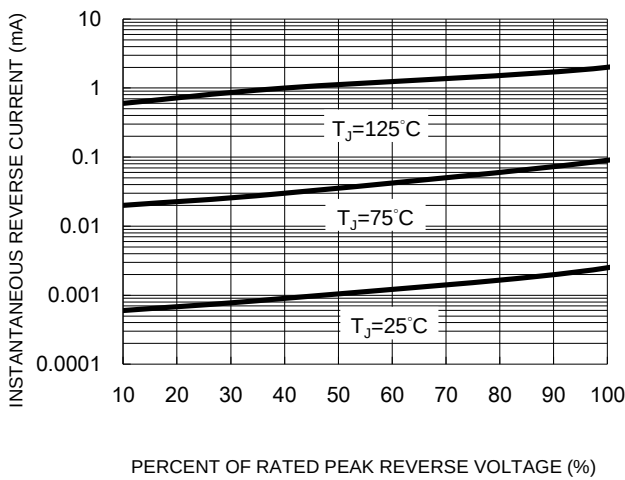
**Fig.1 Forward Current Derating Curve**



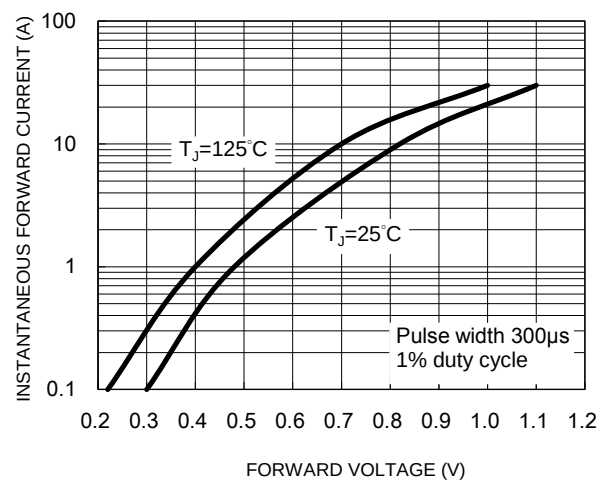
**Fig.2 Typical Junction Capacitance**



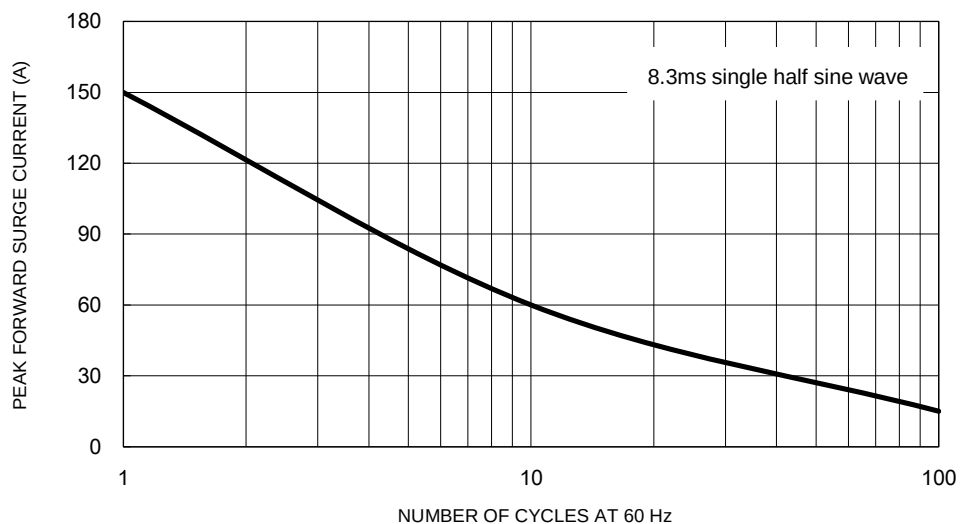
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



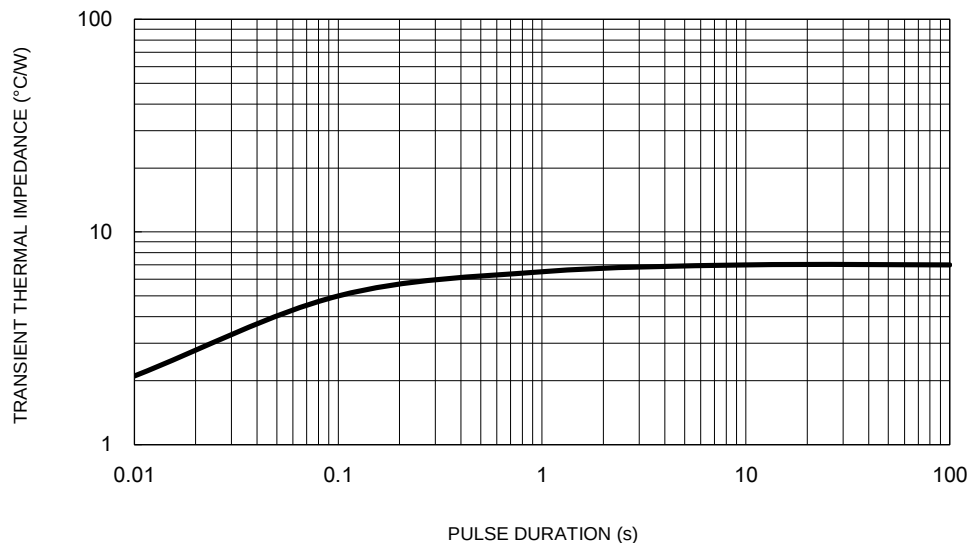
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



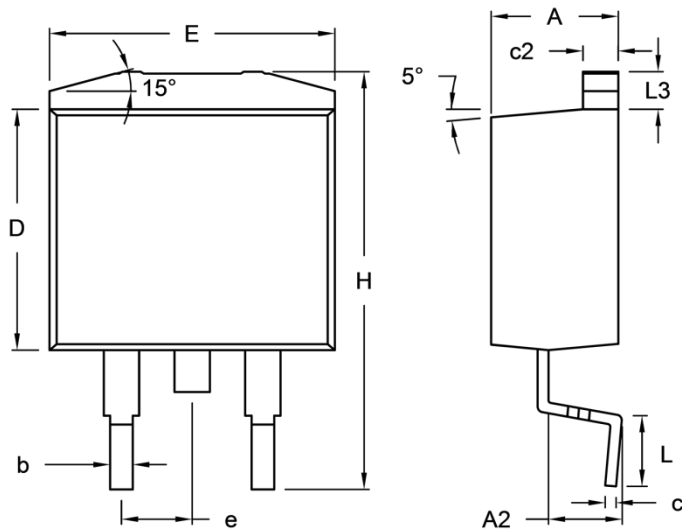
## CHARACTERISTICS CURVES

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

**Fig.6 Typical Transient Thermal Impedance**

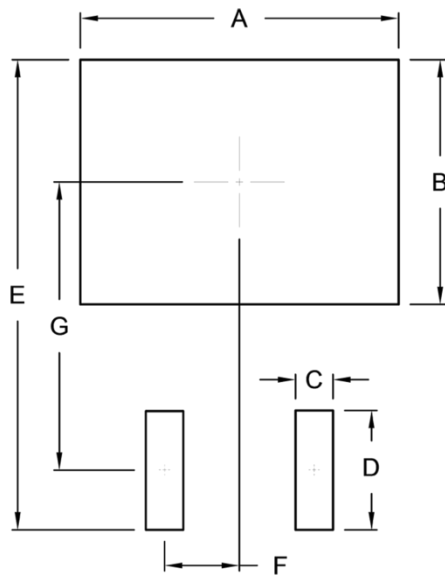


## PACKAGE OUTLINE DIMENSIONS

**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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