

## 30A, 45V - 200V Schottky Barrier Rectifier

### FEATURES

- Low power loss, high efficiency
- Guard ring for overvoltage protection
- High surge current capability
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

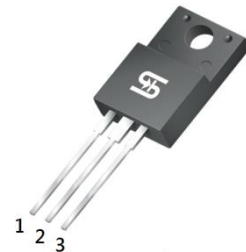
### APPLICATIONS

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

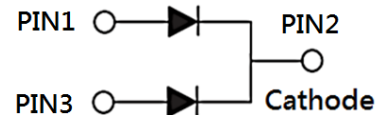
### MECHANICAL DATA

- Case: ITO-220AB
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Mounting torque: 0.56 N·m maximum
- Meet JESD 201 class 1A whisker test
- Polarity: As marked
- Weight: 1.70g (approximately)

| KEY PARAMETERS |           |      |
|----------------|-----------|------|
| PARAMETER      | VALUE     | UNIT |
| $I_F$          | 30        | A    |
| $V_{RRM}$      | 45 - 200  | V    |
| $I_{FSM}$      | 200       | A    |
| $T_{J\ MAX}$   | 150       | °C   |
| Package        | ITO-220AB |      |
| Configuration  | Dual dies |      |



ITO-220AB



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)        |              |                |                |                |                 |                 |                 |                  |
|--|--------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|
| PARAMETER  | SYMBOL       | MBRF 3045 CT-Y | MBRF 3060 CT-Y | MBRF 3080 CT-Y | MBRF 30100 CT-Y | MBRF 30150 CT-Y | MBRF 30200 CT-Y | UNIT             |
| Marking code on the device   |              | MBRF 3045 CT   | MBRF 3060 CT   | MBRF 3080 CT   | MBRF 30100 CT   | MBRF 30150 CT   | MBRF 30200 CT   |                  |
| Repetitive peak reverse voltage  | $V_{RRM}$    | 45             | 60             | 80             | 100             | 150             | 200             | V                |
| Reverse voltage, total rms value   | $V_{R(RMS)}$ | 31             | 42             | 56             | 70              | 105             | 140             | V                |
| Forward current  | $I_F$        | 30             |                |                |                 |                 |                 | A                |
| Surge peak forward current, 8.3ms single half sine wave superimposed on rated load | $I_{FSM}$    | 200            |                |                |                 |                 |                 | A                |
| Peak repetitive reverse surge current <sup>(1)</sup>                               | $I_{RRM}$    | 1.0            |                | 0.5            |                 |                 | A               |                  |
| Peak repetitive forward current (Rated $V_R$ , Square wave, 20KHz)                 | $I_{FRM}$    | 30             |                |                |                 |                 |                 | A                |
| Critical rate of rise of off-state voltage   | dv/dt        | 10,000         |                |                |                 |                 |                 | V/ $\mu\text{s}$ |
| Junction temperature   | $T_J$        | -55 to +150    |                |                |                 |                 |                 | °C               |
| Storage temperature  | $T_{STG}$    | -55 to +150    |                |                |                 |                 |                 | °C               |

**Notes:**

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

| <b>THERMAL PERFORMANCE</b>          |                 |            |               |
|-------------------------------------|-----------------|------------|---------------|
| <b>PARAMETER</b>                    | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b>   |
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 4          | $^{\circ}C/W$ |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}C$ unless otherwise noted) |               |                                 |               |            |            |             |
|--|---------------|---------------------------------|---------------|------------|------------|-------------|
| <b>PARAMETER</b>   |               | <b>CONDITIONS</b>               | <b>SYMBOL</b> | <b>TYP</b> | <b>MAX</b> | <b>UNIT</b> |
| Forward voltage per diode <sup>(1)</sup>                                       | MBRF3045CT-Y  | $I_F = 15A, T_J = 25^{\circ}C$  | $V_F$         | -          | 0.70       | V           |
|  | MBRF3060CT-Y  |                                 |               | -          | 0.78       | V           |
|  | MBRF3080CT-Y  |                                 |               | -          | 0.85       | V           |
|  | MBRF30100CT-Y |                                 |               | -          | 0.95       | V           |
|  | MBRF30150CT-Y |                                 |               | -          | 0.95       | V           |
|  | MBRF30200CT-Y | -                               |               | 0.95       | V          |             |
|  | MBRF3045CT-Y  | $I_F = 30A, T_J = 25^{\circ}C$  |               | -          | 0.82       | V           |
|  | MBRF3060CT-Y  |                                 |               | -          | 0.90       | V           |
|  | MBRF3080CT-Y  |                                 |               | -          | 0.94       | V           |
|  | MBRF30100CT-Y |                                 |               | -          | 0.94       | V           |
| MBRF30150CT-Y  | -             |                                 | 1.05          | V          |            |             |
| Forward voltage per diode <sup>(1)</sup>                                       | MBRF3045CT-Y  | $I_F = 15A, T_J = 125^{\circ}C$ | $V_F$         | -          | 0.60       | V           |
|  | MBRF3060CT-Y  |                                 |               | -          | 0.68       | V           |
|  | MBRF3080CT-Y  |                                 |               | -          | 0.72       | V           |
|  | MBRF30100CT-Y |                                 |               | -          | 0.72       | V           |
|  | MBRF30150CT-Y |                                 |               | -          | 0.80       | V           |
|  | MBRF30200CT-Y | -                               |               | 0.80       | V          |             |
|  | MBRF3045CT-Y  | $I_F = 30A, T_J = 125^{\circ}C$ |               | -          | 0.73       | V           |
|  | MBRF3060CT-Y  |                                 |               | -          | 0.78       | V           |
|  | MBRF3080CT-Y  |                                 |               | -          | 0.82       | V           |
|  | MBRF30100CT-Y |                                 |               | -          | 0.82       | V           |
| MBRF30150CT-Y  | -             |                                 | 0.92          | V          |            |             |
| MBRF30200CT-Y  | -             | 0.92                            | 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>                              | MBRF3045CT-Y  | $T_J = 25^\circ\text{C}$  | $I_R$         | -          | 200        | $\mu\text{A}$ |
|   | MBRF3060CT-Y  |                           |               |            |            |               |
|   | MBRF3080CT-Y  |                           |               |            |            |               |
|   | MBRF30100CT-Y |                           |               |            |            |               |
|   | MBRF30150CT-Y |                           |               |            |            |               |
|   | MBRF30200CT-Y |                           |               |            |            |               |
|   | MBRF3045CT-Y  | $T_J = 125^\circ\text{C}$ |               | -          | 40         | mA            |
|   | MBRF3060CT-Y  |                           |               | -          | 15         | mA            |
| MBRF3080CT-Y  | -             |                           | 10            | mA         |            |               |
| MBRF30100CT-Y   |               |                           |               |            |            |               |
| MBRF30150CT-Y   |               |                           |               |            |            |               |
| MBRF30200CT-Y   |               |                           |               |            |            |               |

**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> |
| MBRF30xCT-Y                        | ITO-220AB      | 50 / Tube      |

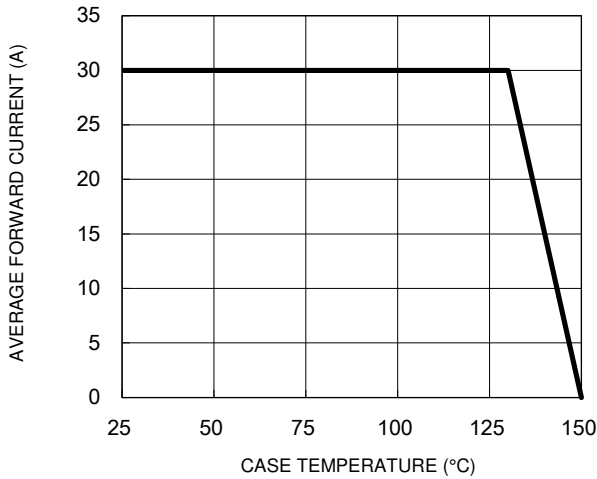
**Notes:**

1. "x" defines voltage from 45V(MBRF3045CT-Y) to 200V(MBRF30200CT-Y)

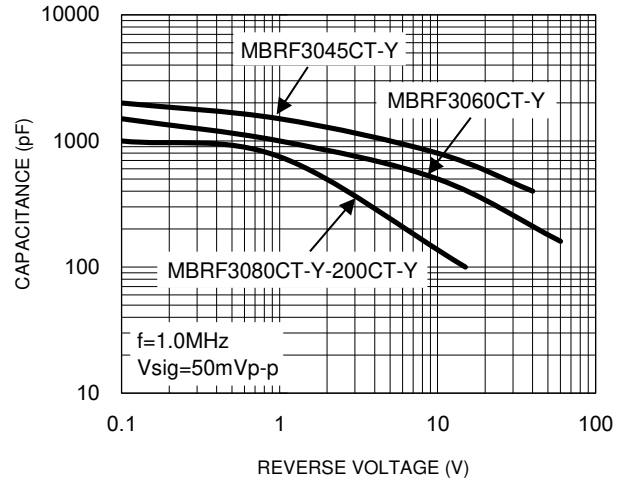
**CHARACTERISTICS CURVES**

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

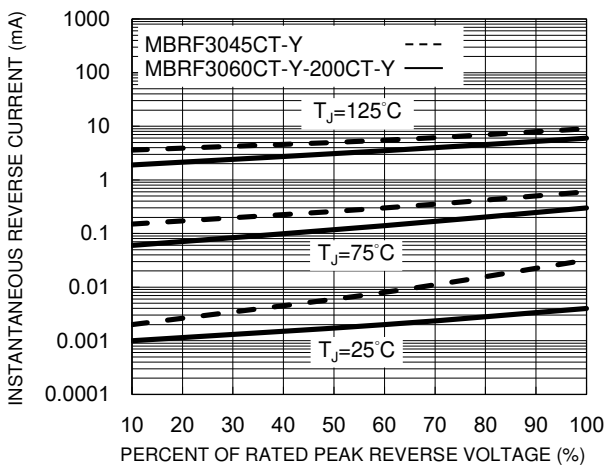
**Fig.1 Forward Current Derating Curve**



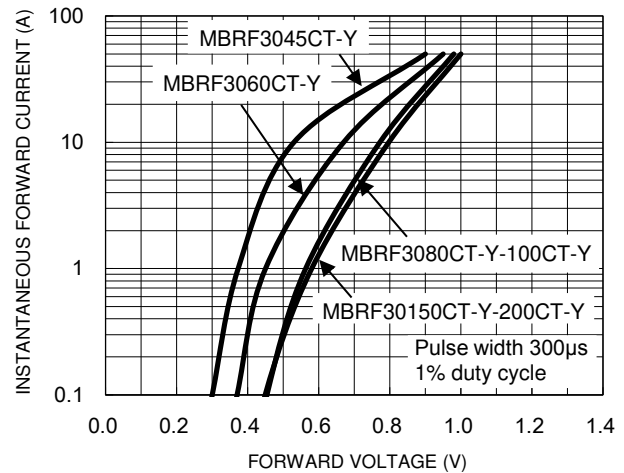
**Fig.2 Typical Junction Capacitance**



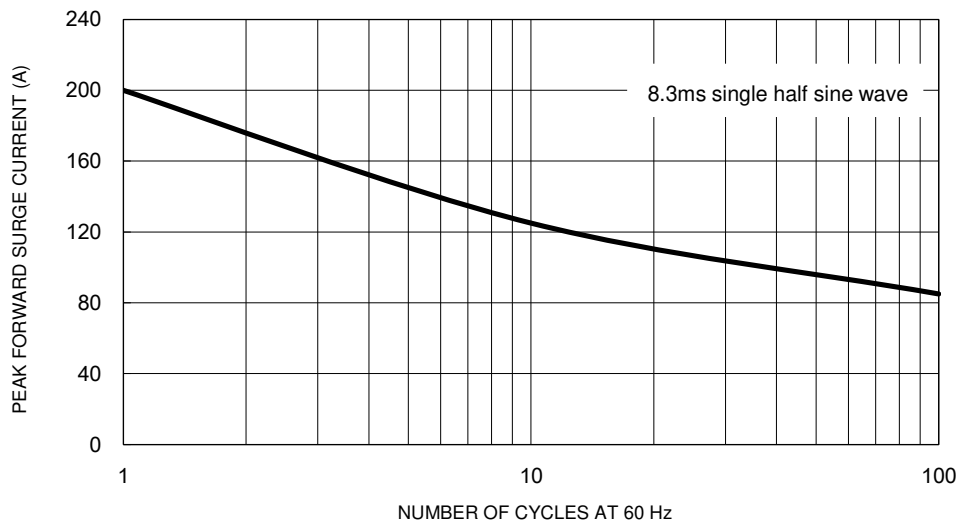
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



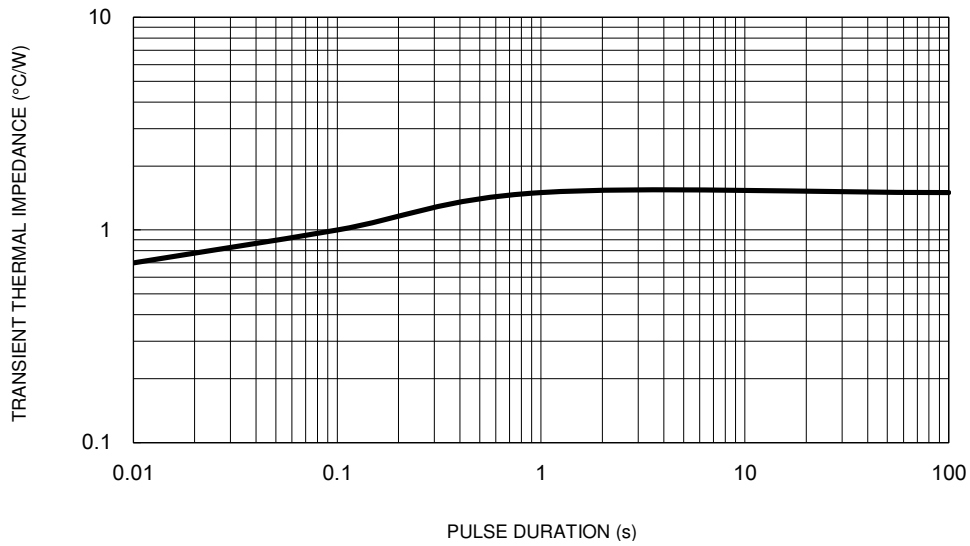
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



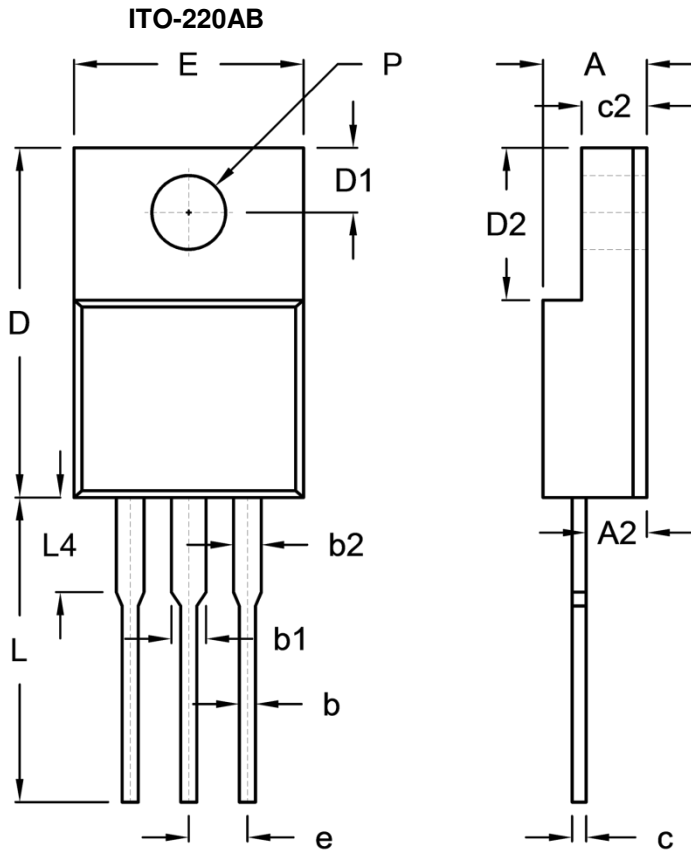
**CHARACTERISTICS CURVES**

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

**Fig.6 Typical Transient Thermal Impedance**



**PACKAGE OUTLINE DIMENSIONS**



| DIM. | Unit (mm) |       | Unit (inch) |       |
|------|-----------|-------|-------------|-------|
|      | Min.      | Max.  | Min.        | Max.  |
| A    | 4.30      | 4.70  | 0.169       | 0.185 |
| A2   | 2.30      | 2.96  | 0.091       | 0.117 |
| b    | 0.50      | 0.90  | 0.020       | 0.035 |
| b1   | -         | 1.80  | -           | 0.071 |
| b2   | 0.95      | 1.45  | 0.037       | 0.057 |
| c    | 0.46      | 0.76  | 0.018       | 0.030 |
| c2   | 2.50      | 3.16  | 0.098       | 0.124 |
| D    | 14.80     | 15.50 | 0.583       | 0.610 |
| D1   | 2.40      | 3.20  | 0.094       | 0.126 |
| D2   | 6.30      | 6.90  | 0.248       | 0.272 |
| E    | 9.60      | 10.30 | 0.378       | 0.406 |
| e    | 2.41      | 2.67  | 0.095       | 0.105 |
| L    | 12.60     | 13.80 | 0.496       | 0.543 |
| L4   | -         | 4.10  | -           | 0.161 |
| P    | 3.00      | 3.40  | 0.118       | 0.134 |

**MARKING DIAGRAM**



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

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