

**MBR2045CT, MBR2045FCT**  
SCHOTTKY BARRIER RECTIFIERS



**VOLTAGE:** 45 Volts

**CURRENT:** 20.0 Amperes

**Marking and Polarity**

**FEATURES**

- Low forward voltage drop for high efficiency
- Low power loss for high reliability
- High forward surge capability for high reliability
- High frequency operation
- Solder bath temperature 260°C maximum, 10s, per JESD22-B106
- Component in accordance to RoHS 2011/65/EU

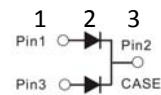
**MECHANICAL DATA**

- **Terminals:** Plated Leads Solderable per MIL-STD-202, Method 208
- **Mounting Position:** Any
- **Lead Free:** Lead Free Finish, RoHS Compliant
- **Polarity:** As marked

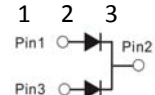
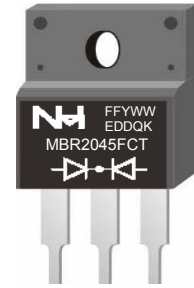
**TYPICAL APPLICATIONS**

- For use in high frequency inverters, Switch power supply AC/DC converters, LED driver etc. applications

**TO-220AB**  
**MBR2045CT**



**TO-220F**  
**MBR2045FCT**



**Remark:**

- ①. NH=niuhang trademark;
- ②. FF=Product line code, According to actual changes  
YWW=Date code, According to actual changes  
EDDQK=Internal code, According to actual changes
- ③. MBR2045CT/FCT=Module.

**Maximum Ratings (Ratings at 25°C ambient temperature unless otherwise specified)**

| Parameter  | Symbol      | MBR2045CT, MBR2045FCT | Unit    |
|--|-------------|-----------------------|---------|
| Maximum repetitive peak reverse voltage  | $V_{RRM}$   | 45                    | V       |
| Maximum average forward rectified current (see fig.1)  | $I_{F(AV)}$ | 20                    | A       |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC method at rated TL) | $I_{FSM}$   | 150                   | A       |
| Peak repetitive reverse current per diode at $t_p=2\mu s$ 1KHz   | $I_{RRM}$   | 100                   | $\mu A$ |

**Electrical Characteristics (Ratings at 25°C ambient temperature unless otherwise specified)**

| Parameter                                       | Test Conditions   | Symbol                                    | MBR2045CT, MBR2045FCT |      |      | Unit |         |
|---|-------------------|---|-----------------------|------|------|------|---------|
|   |                   |   | Min.                  | Typ. | Max. |      |         |
| Instantaneous forward voltage per diode (note1) | $T_A=25^\circ C$  | $I_F=10 A$                                | $V_F$                 | --   | 0.48 | 0.56 | V       |
|   | $T_A=125^\circ C$ |   |                       | --   | 0.40 | 0.51 |         |
| Reverse current per diode (note1)               | $T_A=25^\circ C$  | $V_R=V_{RRM}$<br>$V_R=80\% \cdot V_{RRM}$ | $I_R$                 | --   | 40   | 100  | $\mu A$ |
|   | $T_A=125^\circ C$ |   |                       | --   | 2    | 5    | mA      |
| Typical junction capacitance                    | 4V, 1MHz          | $C_J$                                     | --                    | 570  | --   | pF   |         |

**Thermal Characteristics (Ratings at 25°C ambient temperature unless otherwise specified)**

| Parameter                          | Symbol          | MBR2045CT, MBR2045FCT |         | Unit |
|------------------------------------|-----------------|-----------------------|---------|------|
| Operating junction                 | $T_J$           | -55                   | to 150  | °C   |
| Storage temperature range          | $T_{STD}$       | -55                   | to 150  |      |
| Typical thermal resistance (note2) | $R_{\theta JC}$ | TO-220AB              | TO-220F | °C/W |
|                                    |                 | 2.5                   | 4.5     |      |

- Notes:
1. Pulse test: 300  $\mu s$  pulse width, 1% duty cycle
  2. Device mounted on Device mounted on 75mm x 45mm x 2.5mm Aluminum Plate Heatsink.

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**RATING AND CHARACTERISTIC CURVES**

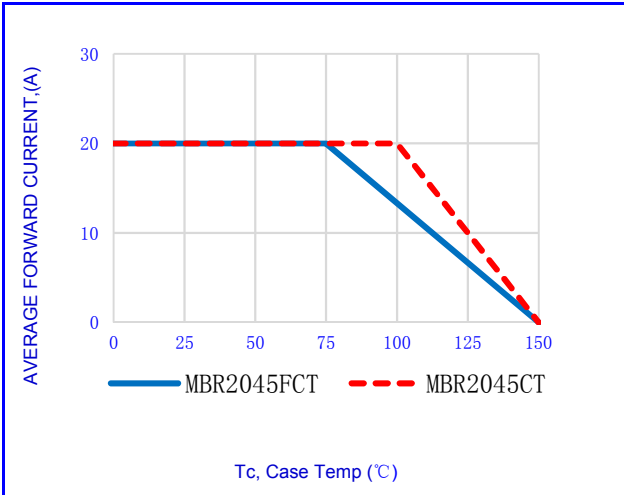


Fig.1-FORWARD CURRENT DERATING CURVE

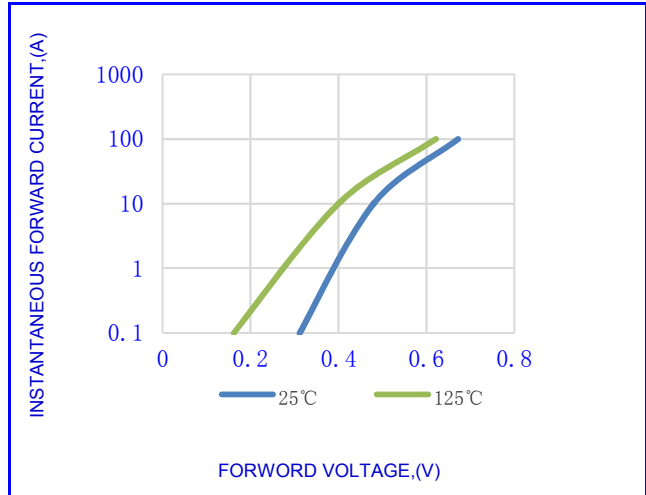


Fig.2- TYPICAL INSTANTANEOUS FORWARD

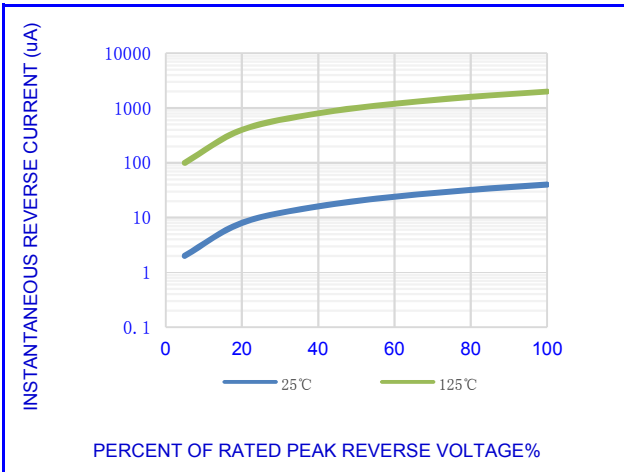


Fig.3- TYPICAL REVERSE CHARACTERISTICS

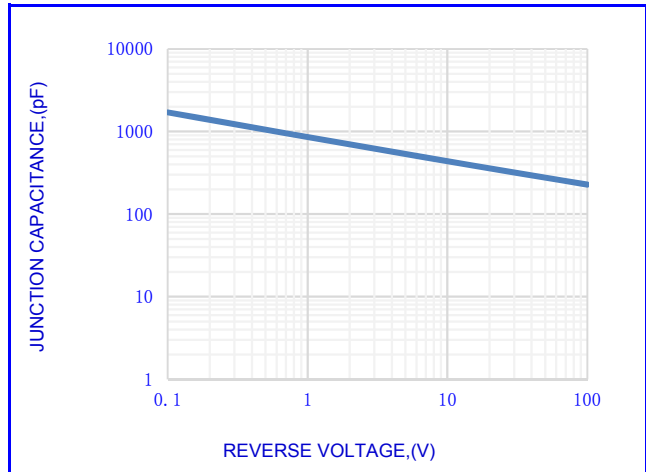


Fig.4- TYPICAL JUNCTION CAPACITANCE

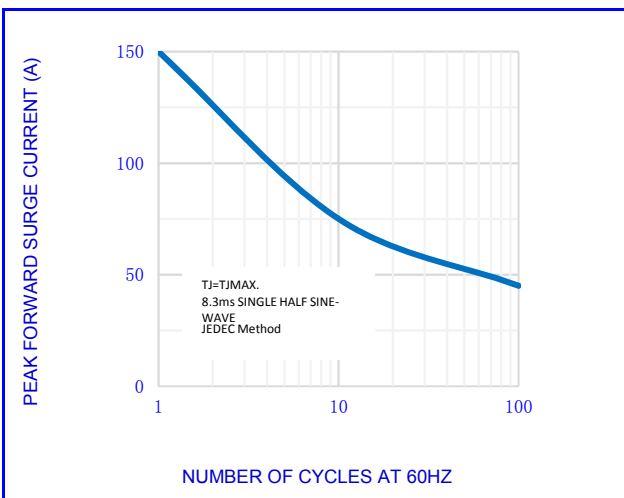


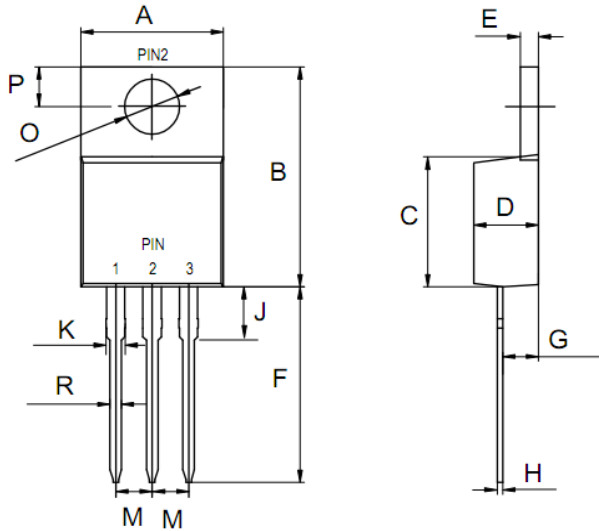
Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

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**OUTLINE DRAWINGS**

**TO-220AB**

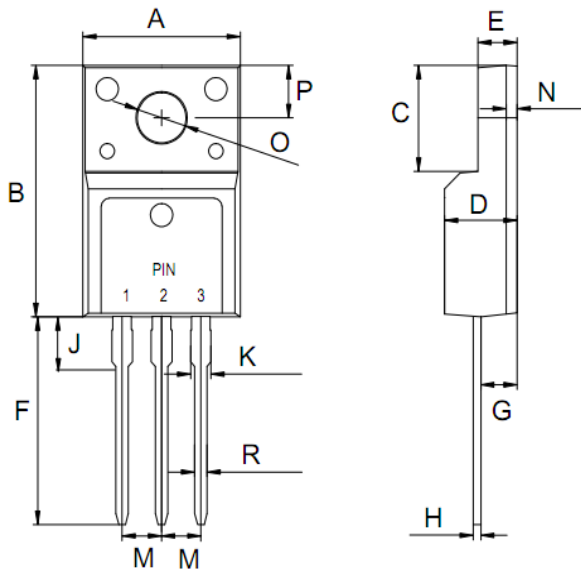


**OUTLINE DIMENSIONS**

| Dim. | Millimeters |      |       | Inches |      |        |
|------|-------------|------|-------|--------|------|--------|
|      | Min.        | Typ. | Max.  | Min.   | Typ. | Max.   |
| A    | 9.80        | -    | 10.40 | 0.3858 | -    | 0.4094 |
| B    | 14.95       | -    | 15.50 | 0.5886 | -    | 0.6102 |
| C    | 8.40        | -    | 9.40  | 0.3307 | -    | 0.3701 |
| D    | 4.20        | -    | 4.70  | 0.1654 | -    | 0.1850 |
| E    | 1.15        | -    | 1.45  | 0.0453 | -    | 0.0571 |
| F    | 12.50       | -    | -     | 0.4921 | -    | -      |
| G    | 2.30        | -    | 2.70  | 0.0906 | -    | 0.1063 |
| H    | 0.30        | -    | 0.45  | 0.0118 | -    | 0.0177 |
| J    | 3.00        | -    | 4.50  | 0.1181 | -    | 0.1772 |
| M    | 2.44        | -    | 2.64  | 0.0961 | -    | 0.1039 |
| R    | 0.70        | -    | 1.00  | 0.0276 | -    | 0.0394 |
| O    | 3.45        | -    | 3.85  | 0.1358 | -    | 0.1516 |
| P    | 2.80        | -    | 3.20  | 0.1102 | -    | 0.1260 |

**OUTLINE DRAWINGS**

**TO-220F**



**OUTLINE DIMENSIONS**

| Dim. | Millimeters |       |       | Inches |        |        |
|------|-------------|-------|-------|--------|--------|--------|
|      | Min.        | Typ.  | Max.  | Min.   | Typ.   | Max.   |
| A    | 9.91        | 10.21 | 10.41 | 0.3902 | 0.4020 | 0.4098 |
| B    | 15.30       | 16.00 | 16.50 | 0.6024 | 0.6299 | 0.6496 |
| C    | 6.20        | 6.75  | 7.20  | 0.2441 | 0.2657 | 0.2835 |
| D    | 4.44        | 4.70  | 4.80  | 0.1748 | 0.1850 | 0.1890 |
| E    | 2.45        | 2.57  | 3.55  | 0.0965 | 0.1012 | 0.1398 |
| F    | 12.50       | 13.50 | 14.50 | 0.4921 | 0.5315 | 0.5709 |
| G    | 2.25        | 2.40  | 2.60  | 0.0886 | 0.0945 | 0.1024 |
| H    | 0.35        | 0.50  | 0.58  | 0.0138 | 0.0197 | 0.0228 |
| J    | 2.60        | 2.88  | 4.00  | 0.1024 | 0.1134 | 0.1575 |
| M    | 2.41        | 2.50  | 2.67  | 0.0949 | 0.0984 | 0.1051 |
| N    | 4.88        | 5.00  | 5.28  | 0.1921 | 0.1969 | 0.2079 |
| R    | 0.58        | 0.82  | 0.94  | 0.0228 | 0.0323 | 0.0370 |
| O    | 3.25        | 3.55  | 3.75  | 0.1280 | 0.1398 | 0.1476 |
| P    | 2.15        | 3.30  | 3.50  | 0.0846 | 0.1299 | 0.1378 |

**PACKING INFORMATION**

| Package Code | Package Method | Tube Size L×W×H(mm) | Quantity (pcs/Tube) | Inner Box Size L×W×H(mm) | Quantity (pcs/Inner Box) | Outer Carton Size L×W×H(mm) | Quantity (pcs/carton) |
|--------------|----------------|---------------------|---------------------|--------------------------|--------------------------|-----------------------------|-----------------------|
| TO-220AB     | Tube           | 530x35x8            | 50                  | 560x155x55               | 1000                     | 570×284×185                 | 5000                  |
| TO-220F      | Tube           | 530x35x8            | 50                  | 560x155x55               | 1000                     | 570×284×185                 | 5000                  |

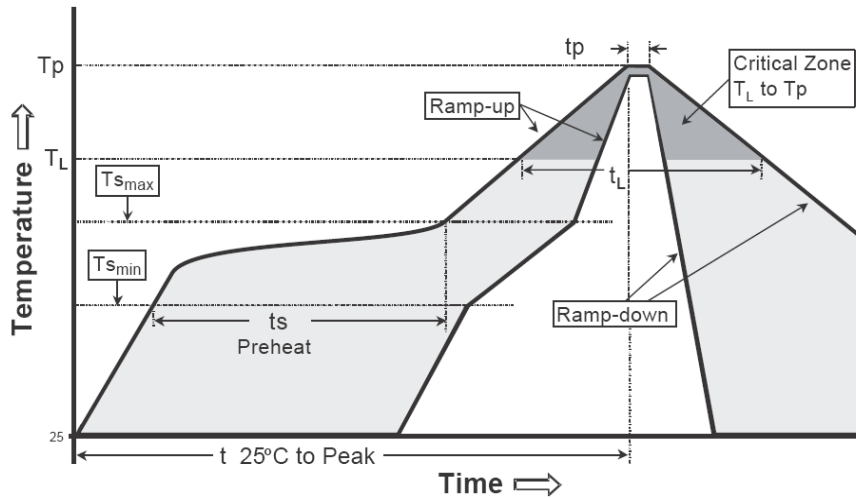
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**Recommended wave soldering condition**

| Product         | Peak Temperature | Soldering Time  |
|-----------------|------------------|-----------------|
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

**Recommended temperature profile for IR reflow**



| Profile feature  | Sn-Pb eutectic Assembly          | Pb-free Assembly                 |
|--|----------------------------------|----------------------------------|
| Average ramp-up rate (Tsmmax to Tp)  | 3°C/second max.                  | 3°C/second max.                  |
| Preheat<br>-Temperature Min(TS min)<br>-Temperature Max(TS max)<br>-Time(ts min to ts max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature (TL)<br>- Time (tL)                                 | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak Temperature(TP)   | 240 +0/-5 °C                     | 260 +0/-5 °C                     |
| Time within 5°C of actual peak temperature(tp)   | 10-30 seconds                    | 20-40 seconds                    |
| Ramp down rate   | 6°C/second max.                  | 6°C/second max.                  |
| Time 25 °C to peak temperature   | 6 minutes max.                   | 8 minutes max.                   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

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