
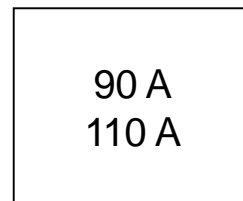


### THREE PHASE BRIDGE

### Power Modules

#### Features

- Package fully compatible with the industry standard INT-A-pak power modules series
- High thermal conductivity package, electrically insulated case
- Outstanding number of power encapsulated components
- Excellent power volume ratio, outline for easy connections to power transistor and IGBT modules
- 4000 V<sub>RMS</sub> isolating voltage
- UL E78996 approved 



#### Description

A range of extremely compact, encapsulated three phase bridge rectifiers offering efficient and reliable operation. They are intended for use in general purpose and heavy duty applications.

#### Major Ratings and Characteristics

| Parameters      | 90MT.KB     | 110MT.KB  | Units             |
|-----------------|-------------|-----------|-------------------|
| $I_O$           | 90 (120)    | 110 (150) | A                 |
| @ $T_C$         | 90 (61)     | 90 (57)   | °C                |
| $I_{FSM}$       | 770         | 950       | A                 |
| @ 50Hz          | 810         | 1000      | A                 |
| @ 60Hz          | 3000        | 4500      | A <sup>2</sup> s  |
| $I^2t$          | 2700        | 4100      | A <sup>2</sup> s  |
| @ 50Hz          | 30000       | 45000     | A <sup>2</sup> √s |
| @ 60Hz          |             |           |                   |
| $V_{RRM}$ range | 800 to 1600 |           | V                 |
| $T_{STG}$ range | -40 to 150  |           | °C                |
| $T_J$ range     | -40 to 150  |           | °C                |

## 90-110MT..KB Series

Bulletin I27501 rev. A 05/03

International  
IR Rectifier

### ELECTRICAL SPECIFICATIONS

#### Voltage Ratings

| Type number  | Voltage Code | $V_{RRM}$ , maximum repetitive peak reverse voltage<br>V | $V_{RSM}$ , maximum non-repetitive peak rev. voltage<br>V | $I_{RRM}$ max.<br>@ $T_J$ max.<br>mA |
|--------------|--------------|--|---|--------------------------------------|
| 90-110MT..KB | 80           | 800  | 900   | 10                                   |
|              | 100          | 1000   | 1100  |                                      |
|              | 120          | 1200   | 1300  |                                      |
|              | 140          | 1400   | 1500  |                                      |
|              | 160          | 1600   | 1700  |                                      |

#### Forward Conduction

| Parameter  | 90MT.KB  | 110MT.KB  | Units             | Conditions   |
|--|----------|-----------|-------------------|--|
| $I_O$ Maximum DC output current<br>@ Case temperature                      | 90 (120) | 110 (150) | A                 | 120° Rect conduction angle   |
|  | 90 (61)  | 90 (57)   | °C                |  |
| $I_{FSM}$ Maximum peak, one-cycle forward,<br>non-repetitive surge current | 770      | 950       | A                 | t = 10ms No voltage  |
|  | 810      | 1000      |                   | t = 8.3ms reapplied  |
|  | 650      | 800       |                   | t = 10ms 100% $V_{RRM}$  |
|  | 680      | 840       |                   | t = 8.3ms reapplied  |
| $I^2t$ Maximum $I^2t$ for fusing   | 3000     | 4500      | A <sup>2</sup> s  | t = 10ms No voltage  |
|  | 2700     | 4100      |                   | t = 8.3ms reapplied  |
|  | 2100     | 3200      |                   | t = 10ms 100% $V_{RRM}$  |
|  | 1900     | 2900      |                   | t = 8.3ms reapplied  |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing                             | 30000    | 45000     | A <sup>2</sup> √s | t = 0.1 to 10ms, no voltage reapplied  |
| $V_{F(TO)1}$ Low level value of threshold voltage                          | 0.89     | 0.81      | V                 | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , @ $T_J$ max. |
| $V_{F(TO)2}$ High level value of threshold voltage                         | 1.05     | 0.99      | V                 | $(I > \pi \times I_{F(AV)})$ , @ $T_J$ max.                                      |
| $r_{F1}$ Low level value of forward slope resistance                       | 5.11     | 4.37      | mΩ                | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , @ $T_J$ max. |
| $r_{F2}$ High level value of forward slope resistance                      | 4.64     | 4.64      | mΩ                | $(I > \pi \times I_{F(AV)})$ , @ $T_J$ max.                                      |
| $V_{FM}$ Maximum forward voltage drop                                      | 1.6      | 1.4       | V                 | $I_{pk} = 150A$ , $T_J = 25^\circ C$ , $t_p = 400\mu s$ single junction          |
| $V_{INS}$ RMS isolation voltage  | 4000     | 4000      | V                 | $T_J = 25^\circ C$ , all terminal shorted<br>f = 50Hz, t = 1s                    |

#### Thermal and Mechanical Specifications

| Parameter  | 90MT.KB     | 110MT.KB | Units | Conditions   |
|--|-------------|----------|-------|--|
| $T_J$ Max. junction operating temperature range      | -40 to 150  |          | °C    |  |
| $T_{stg}$ Max. storage temperature range             | -40 to 150  |          | °C    |  |
| $R_{thJC}$ Max. thermal resistance, junction to case | 0.21        | 0.18     | K/W   | DC operation per module  |
|  | 1.26        | 1.07     |       | DC operation per junction  |
|  | 0.25        | 0.21     |       | 120° Rect conduction angle per module  |
|  | 1.47        | 1.25     |       | 120° Rect conduction angle per junction  |
| $R_{thCS}$ Max. thermal resistance, case to heatsink | 0.03        |          | K/W   | Per module<br>Mounting surface smooth, flat and greased  |
| T Mounting torque ± 10%                              | to heatsink | 4 to 6   | Nm    | A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound. Lubricated threads. |
|  | to terminal | 3 to 4   |       |  |
| wt Approximate weight                                | 176         |          | g     |  |



# 90-110MT..KB Series

Bulletin I27501 rev. A 05/03

## Outline Table (with optional barriers)

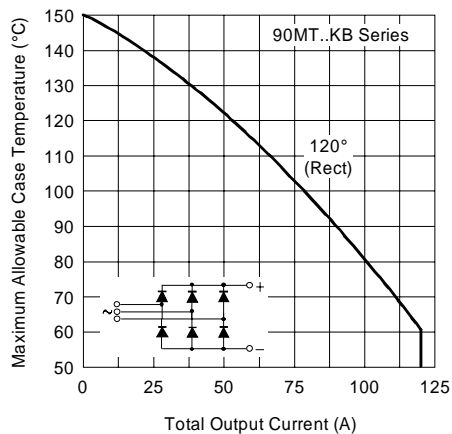
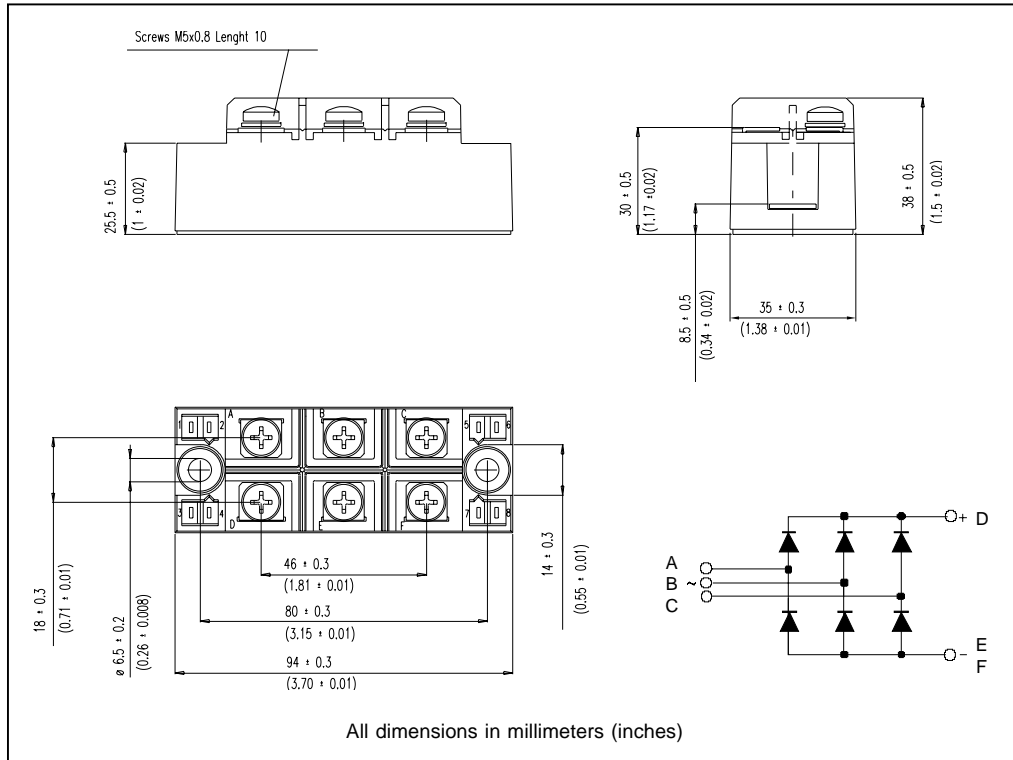


Fig. 1 - Current Ratings Characteristics

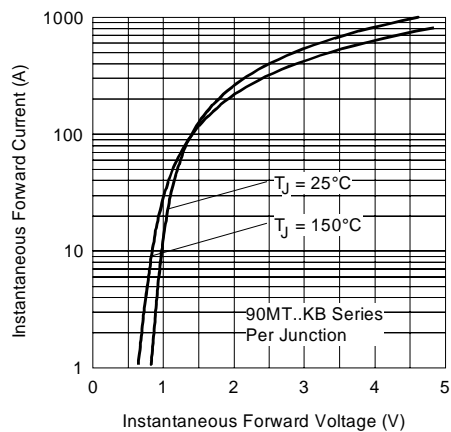


Fig. 2 - Forward Voltage Drop Characteristics

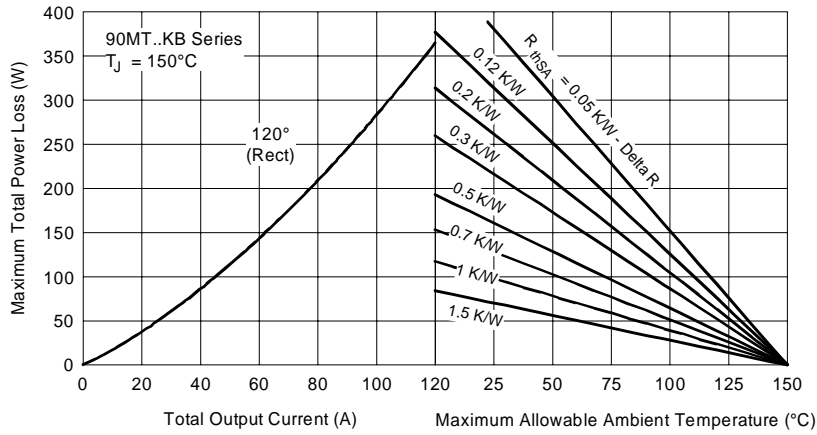


Fig. 3 - Total Power Loss Characteristics

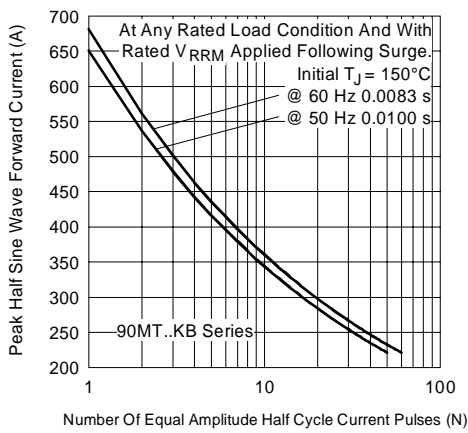


Fig. 4 - Maximum Non-Repetitive Surge Current

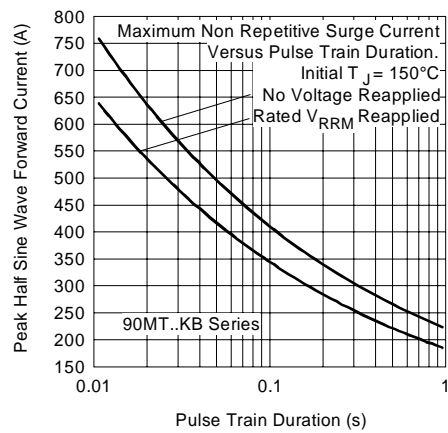


Fig. 5 - Maximum Non-Repetitive Surge Current

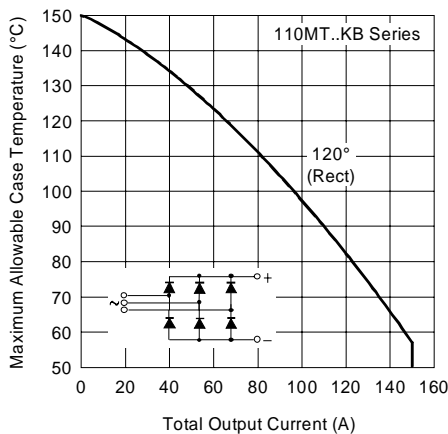


Fig. 6 - Current Ratings Characteristics

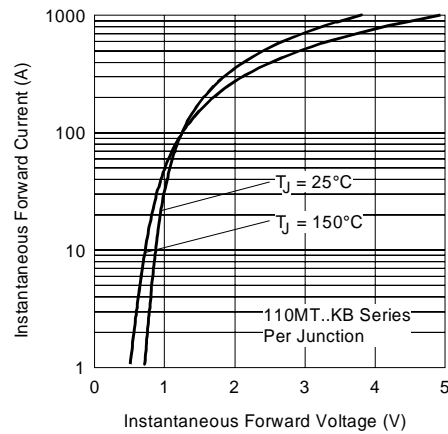


Fig. 7 - Forward Voltage Drop Characteristics

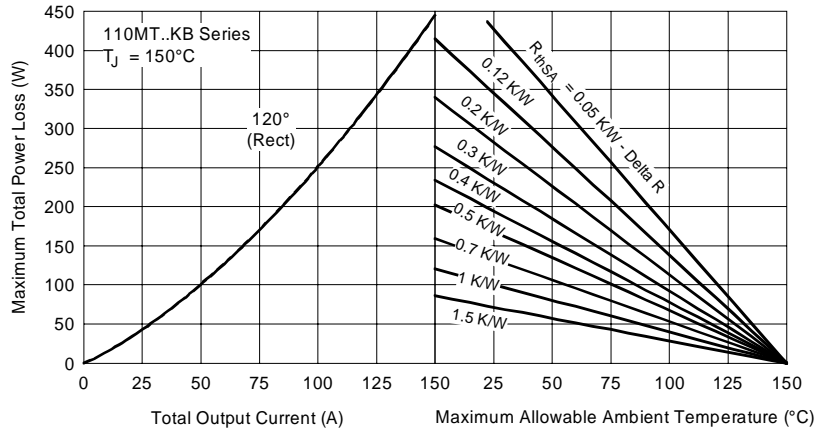


Fig. 8 - Total Power Loss Characteristics

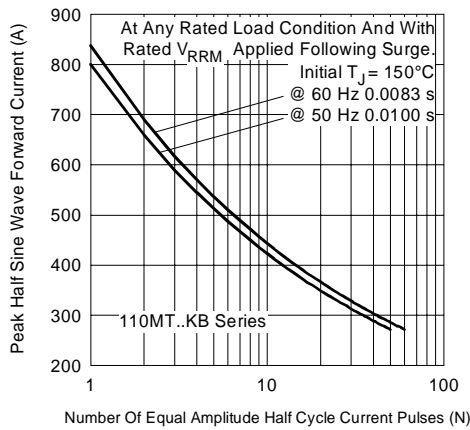


Fig. 9 - Maximum Non-Repetitive Surge Current

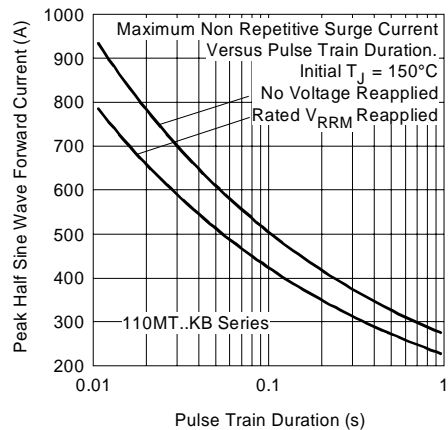


Fig. 10 - Maximum Non-Repetitive Surge Current

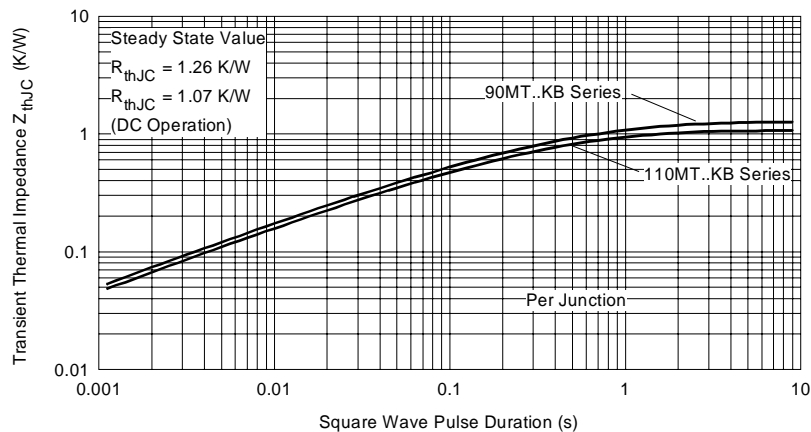


Fig. 11 - Thermal Impedance  $Z_{thJC}$  Characteristic

Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IOR** Rectifier

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7309  
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