


### 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 

90 A  
110 A

#### 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	770	950	A
@ 60Hz	810	1000	A
$I^2t$	3000	4500	A <sup>2</sup> s
@ 50Hz	3000	4500	A <sup>2</sup> s
@ 60Hz	2700	4100	A <sup>2</sup> s
$I^2\sqrt{t}$	30000	45000	A <sup>2</sup> √s
$V_{RRM}$ 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 V	$V_{RSM}$ , maximum non-repetitive peak rev. voltage V	$I_{RRM}$ max. @ $T_J$ max. 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 @ Case temperature	90 (120) 90 (61)	110 (150) 90 (57)	A °C	120° Rect conduction angle
$I_{FSM}$ Maximum peak, one-cycle forward, non-repetitive surge current	770	950	A	t = 10ms No voltage reappplied
	810	1000		t = 8.3ms
	650	800		t = 10ms 100% $V_{RRM}$ reappplied
	680	840		t = 8.3ms
$I^2t$ Maximum $I^2t$ for fusing	3000	4500	A <sup>2</sup> s	t = 10ms No voltage reappplied
	2700	4100		t = 8.3ms
	2100	3200		t = 10ms 100% $V_{RRM}$ reappplied
	1900	2900		t = 8.3ms
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	30000	45000	A <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ 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		( $I > \pi \times I_{F(AV)}$ ), @ $T_J$ 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		( $I > \pi \times I_{F(AV)}$ ), @ $T_J$ 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 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 Mounting surface smooth, flat and greased
T Mounting torque $\pm 10\%$	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	

Ordering Information Table

Device Code					
11	0	MT	160	K	B
①	②	③	④	⑤	

- 1** - Current rating code: 9 = 90 A (Avg)  
 11 = 110 A (Avg)
- 2** - Three phase diodes bridge
- 3** - Essential part number
- 4** - Voltage code: Code x 10 =  $V_{RRM}$  (See Voltage Ratings Table)
- 5** - Generation II

Outline Table (without optional barriers)

Screws M5 x 0.8 Length 10

All dimensions in millimeters (inches)

**NOTE: To order the Optional Hardware see Bulletin I27900**

Outline Table (with optional barriers)

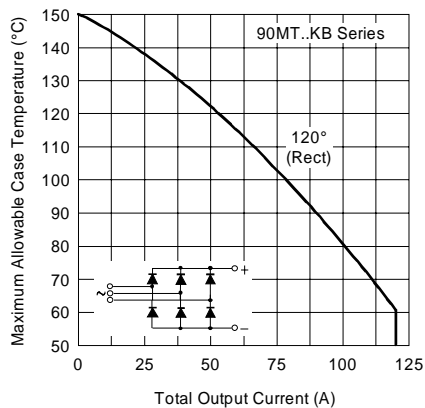
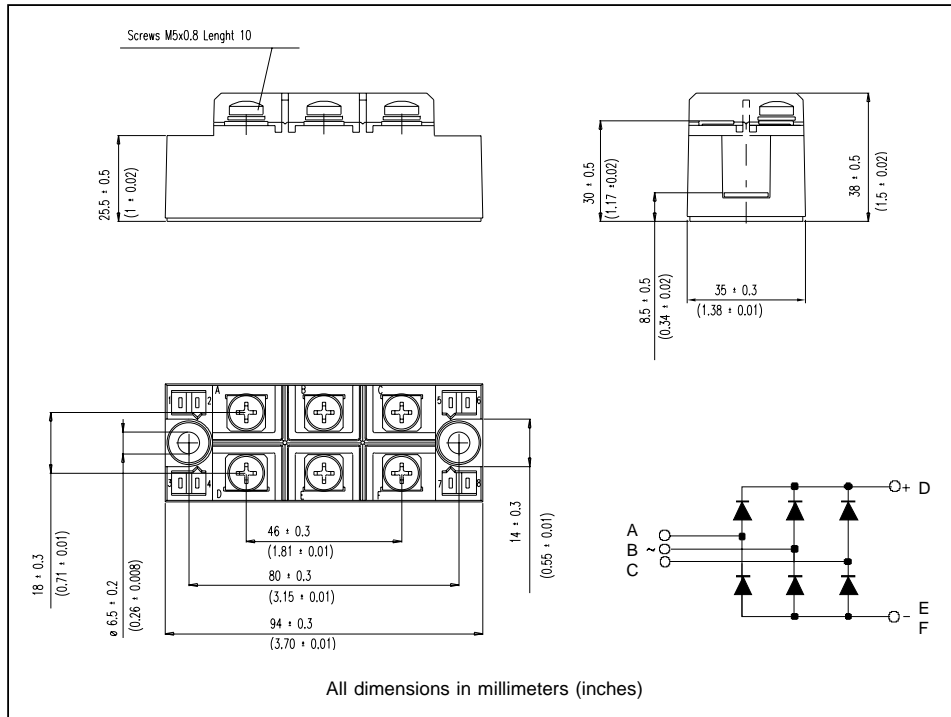


Fig. 1 - Current Ratings Characteristics

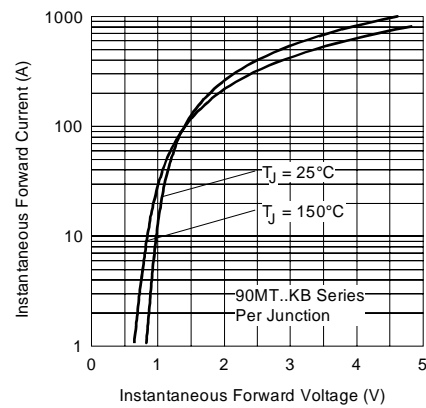


Fig. 2 - Forward Voltage Drop Characteristics

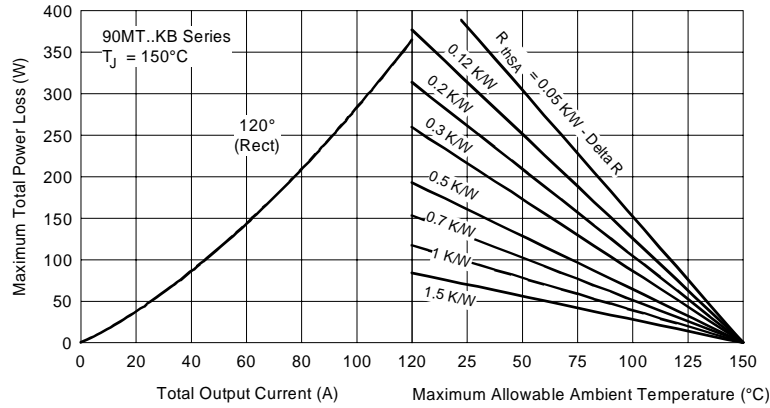


Fig. 3 - Total Power Loss Characteristics

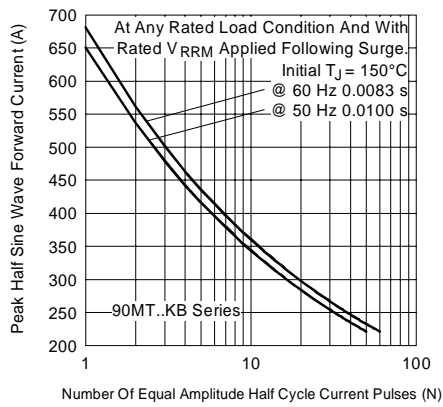


Fig. 4 - Maximum Non-Repetitive Surge Current

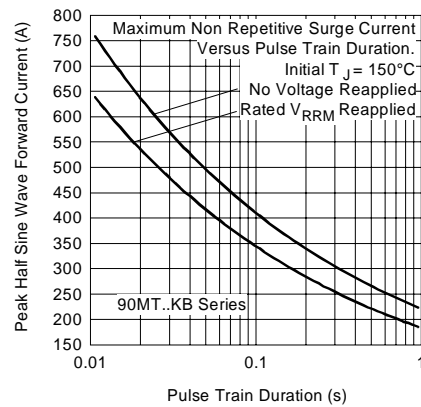


Fig. 5 - Maximum Non-Repetitive Surge Current

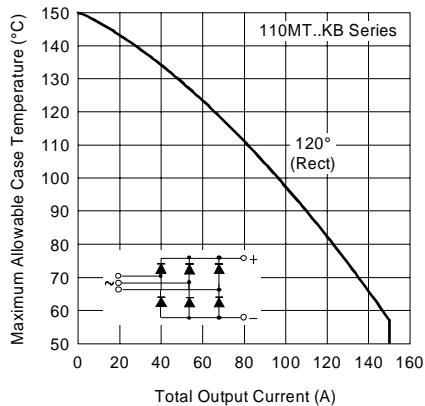


Fig. 6 - Current Ratings Characteristics

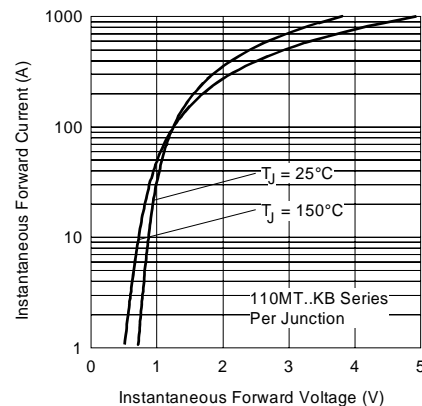


Fig. 7 - Forward Voltage Drop Characteristics

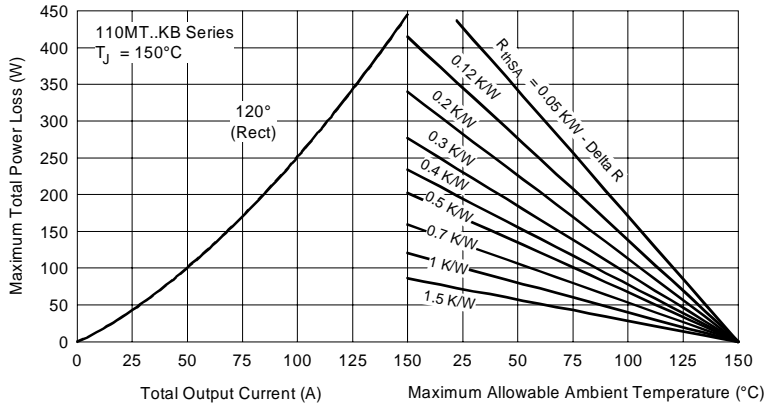


Fig. 8 - Total Power Loss Characteristics

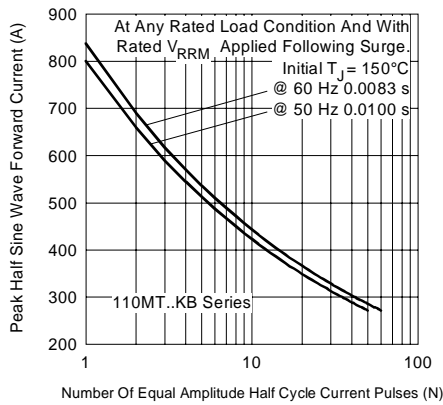


Fig. 9 - Maximum Non-Repetitive Surge Current

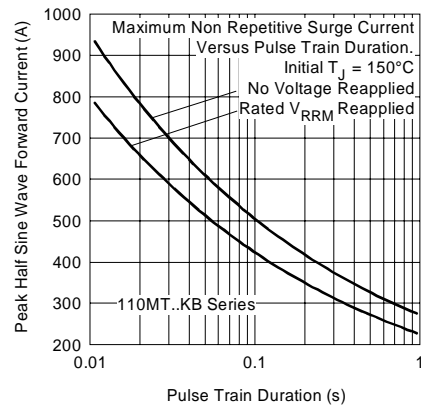


Fig. 10 - Maximum Non-Repetitive Surge Current

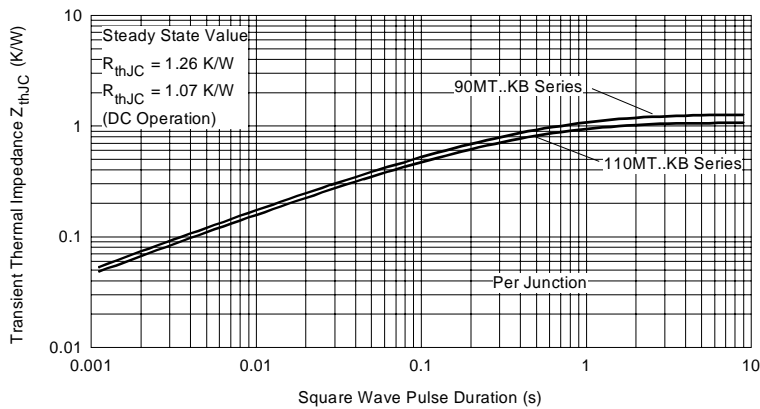


Fig. 11 - Thermal Impedance  $Z_{thJC}$  Characteristic

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  
**IR** Rectifier

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