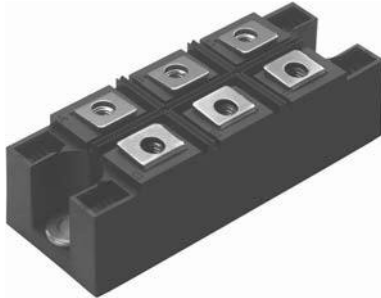



## Three Phase Bridge (Power Modules), 90/110 A



MTK

**FEATURES**

- Package fully compatible with the industry standard INT-A-PAK power modules series
- High thermal conductivity package, electrically insulated case
- Excellent power volume ratio, outline for easy connections to power transistor and IGBT modules
- 4000 V<sub>RMS</sub> isolating voltage
- UL E78996 approved 
- Totally lead (Pb)-free
- Designed and qualified for industrial level


**RoHS  
COMPLIANT**
**PRODUCT SUMMARY**

$I_o$	90/110 A
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**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**

SYMBOL	CHARACTERISTICS	90MT.K	110MT.K	UNITS
$I_o$		90 (120)	110 (150)	A
	$T_c$	90 (61)	90 (57)	°C
$I_{FSM}$	50 Hz	770	950	A
	60 Hz	810	1000	
$I^2t$	50 Hz	3000	4500	A <sup>2</sup> s
	60 Hz	2700	4100	
$I^2\sqrt{t}$		30 000	45 000	A <sup>2</sup> √s
$V_{RRM}$	Range	800 to 1600		V
$T_{Stg}$	Range	- 40 to 150		°C
$T_J$				

**ELECTRICAL SPECIFICATIONS**
**VOLTAGE RATINGS**

TYPE NUMBER	VOLTAGE CODE	$V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ MAXIMUM AT $T_J =$ MAXIMUM mA
90-110MT..K	80	800	900	10
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	
	160	1600	1700	

FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS		90MT.K	110MT.K	UNITS	
Maximum DC output current at case temperature	$I_o$	120° rect. conduction angle		90 (120)	110 (150)	A	
				90 (61)	90 (57)	°C	
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reappplied	Initial $T_J = T_J$ maximum	770	950	A
		t = 8.3 ms			810	1000	
		t = 10 ms	100 % $V_{RRM}$ reappplied		650	800	
		t = 8.3 ms			680	840	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied	Initial $T_J = T_J$ maximum	3000	4500	$A^2s$
		t = 8.3 ms			2700	4100	
		t = 10 ms	100 % $V_{RRM}$ reappplied		2100	3200	
		t = 8.3 ms			1900	2900	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		30 000	45 000	$A^2\sqrt{s}$	
Low level value of threshold voltage	$V_{F(TO)1}$	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J$ maximum		0.89	0.81	V	
High level value of threshold voltage	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$ , $T_J$ maximum		1.05	0.99		
Low level value of forward slope resistance	$r_{f1}$	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J$ maximum		5.11	4.37	$m\Omega$	
High level value of forward slope resistance	$r_{f2}$	$(I > \pi \times I_{F(AV)})$ , $T_J$ maximum		4.64			
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 150$ A, $T_J = 25$ °C $t_p = 400$ $\mu s$ single junction		1.6	1.4	V	
RMS isolation voltage	$V_{ISOL}$	$T_J = 25$ °C, all terminal shorted f = 50 Hz, t = 1 s		4000			

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		90MT.K	110MT.K	UNITS
Maximum junction operating and storage temperature range	$T_J, T_{Stg}$			- 40 to 150		°C
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation per module		0.21	0.18	$^{\circ}C/W$
		DC operation per junction		1.26	1.07	
		120° rect. conduction angle per module		0.25	0.21	
		120° rect. conduction angle per junction		1.47	1.25	
Maximum thermal resistance, case to heatsink per module	$R_{thCS}$	Mounting surface smooth, flat and greased		0.03		
Mounting torque $\pm 10$ %	to heatsink to terminal	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.		4 to 6		Nm
				3 to 4		
Approximate weight				176		g

## Three Phase Bridge (Power Modules), 90/110 A

Vishay High Power Products

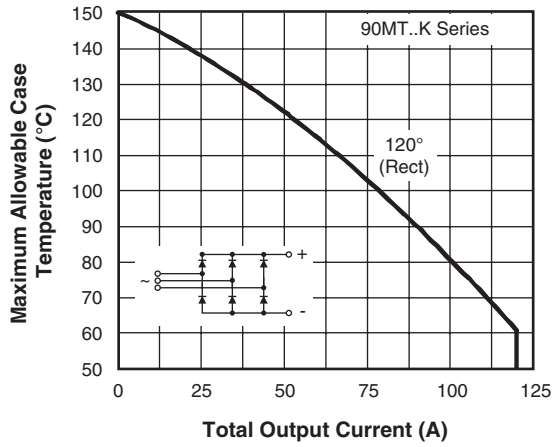


Fig. 1 - Current Ratings Characteristics

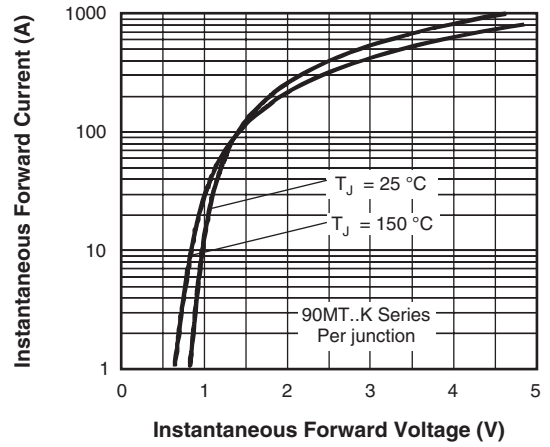


Fig. 2 - Forward Voltage Drop Characteristics

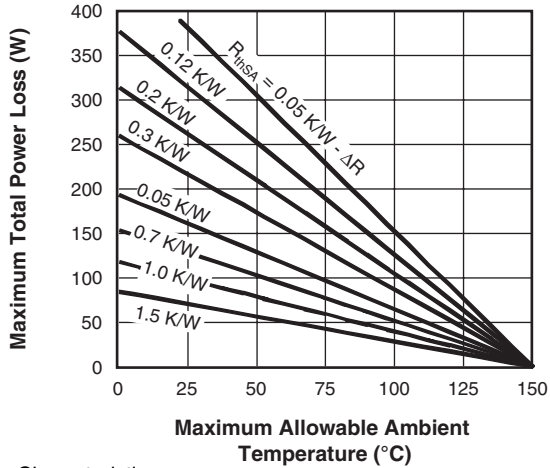
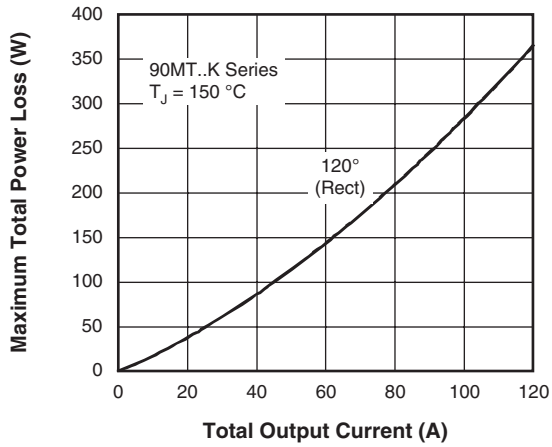


Fig. 3 - Total Power Loss Characteristics

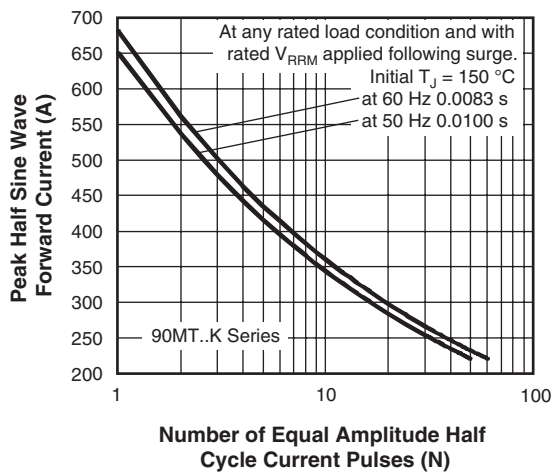


Fig. 4 - Maximum Non-Repetitive Surge Current

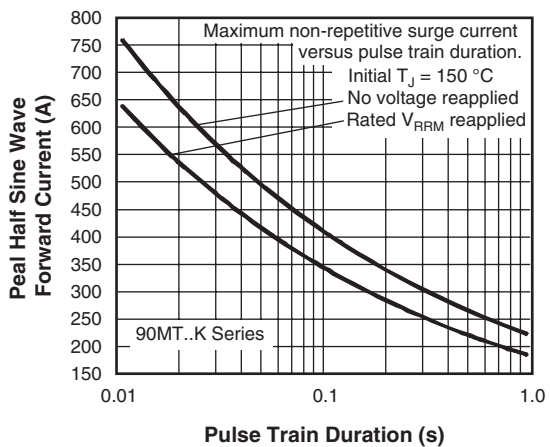


Fig. 5 - Maximum Non-Repetitive Surge Current

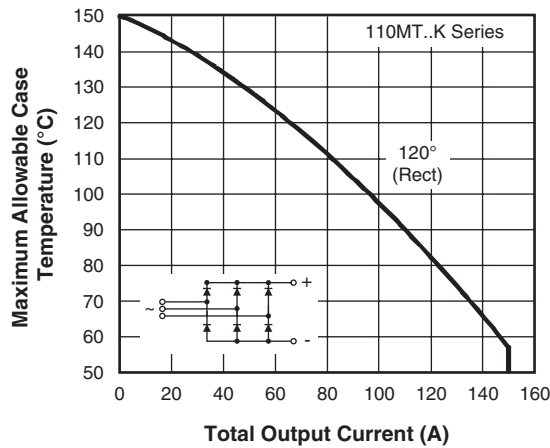


Fig. 6 - Current Ratings Characteristics

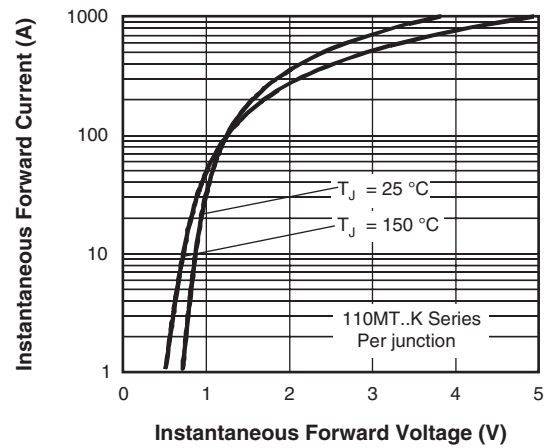


Fig. 7 - Forward Voltage Drop Characteristics

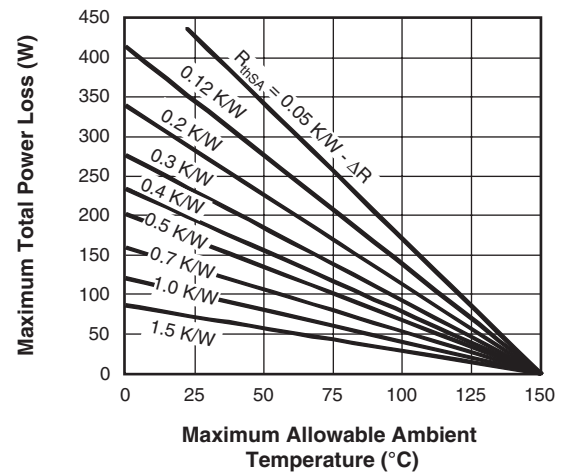
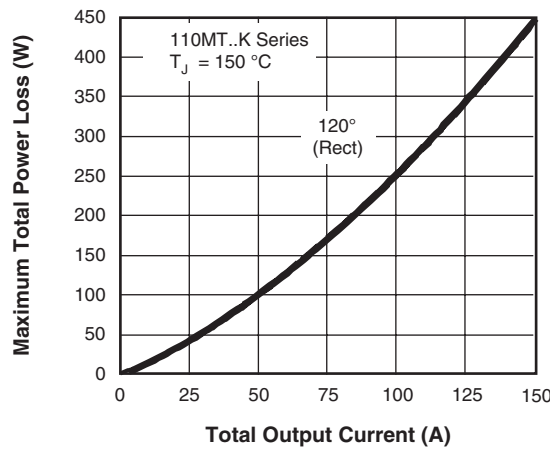


Fig. 8 - Total Power Loss Characteristics

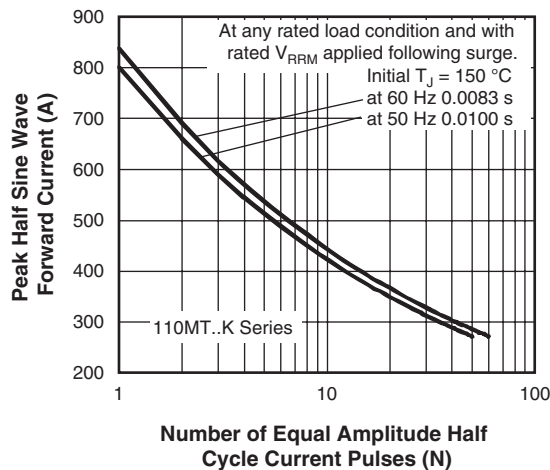


Fig. 9 - Maximum Non-Repetitive Surge Current

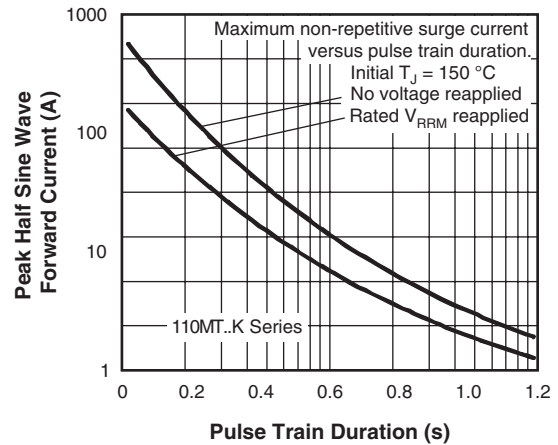


Fig. 10 - Maximum Non-Repetitive Surge Current

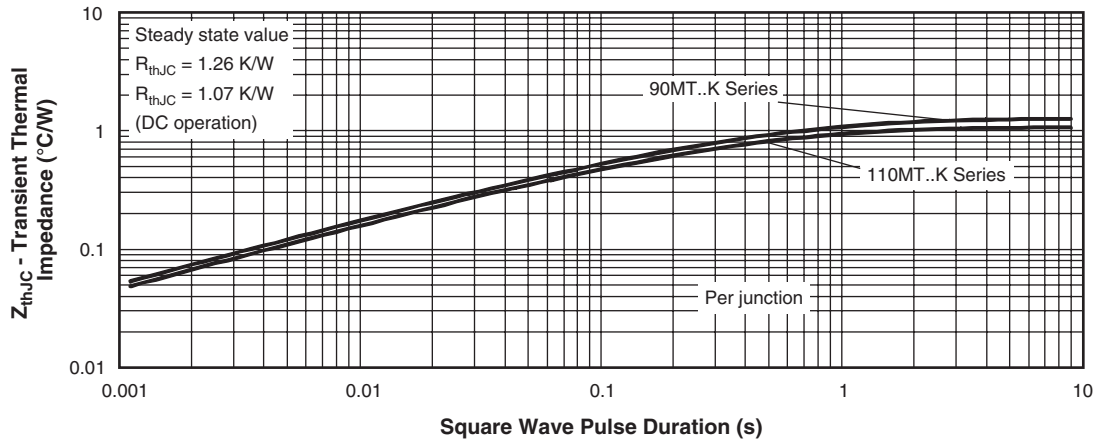


Fig. 11 - Thermal Impedance  $Z_{thJC}$  Characteristic

### ORDERING INFORMATION TABLE

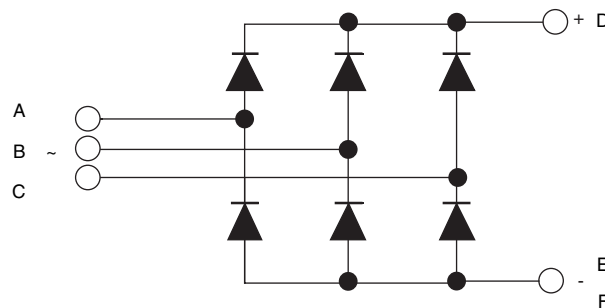
Device code	<b>11</b>	<b>0</b>	<b>MT</b>	<b>160</b>	<b>K</b>	<b>PbF</b>
	①	②	③	④		⑤

- 1** - Current rating code: 9 = 90 A (average)  
11 = 110 A (average)
- 2** - Three phase diodes bridge
- 3** - Essential part number
- 4** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 5** - PbF = Lead (Pb)-free

#### Note

- To order the optional hardware go to [www.vishay.com/doc?95172](http://www.vishay.com/doc?95172)

### CIRCUIT CONFIGURATION



#### LINKS TO RELATED DOCUMENTS

Dimensions and pin out positions

<http://www.vishay.com/doc?95004>

## MTK (with and without optional barrier)

### DIMENSIONS WITH OPTIONAL BARRIERS in millimeters (inches)



# Outline Dimensions

Vishay Semiconductors MTK (with and without optional barrier)



## DIMENSIONS WITHOUT OPTIONAL BARRIERS in millimeters (inches)





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