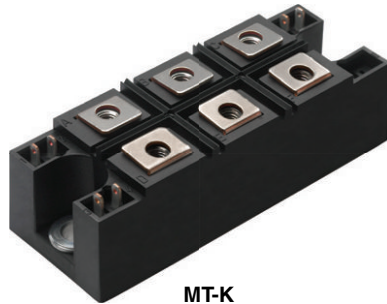




# Three Phase Bridge (Power Modules), 90 A/110 A



MT-K

### 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  $V_{RMS}$  isolating voltage
- UL E78996 approved
- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

PRODUCT SUMMARY	
$I_O$	90 A to 110 A
$V_{RRM}$	800 V to 1600 V
Package	MT-K
Circuit	Three phase bridge

### 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)	$^{\circ}C$
$I_{FSM}$	50 Hz	770	950	A
	60 Hz	810	1000	
$I^2t$	50 Hz	3000	4500	$A^2s$
	60 Hz	2700	4100	
$I^2\sqrt{t}$		30 000	45 000	$A^2\sqrt{s}$
$V_{RRM}$	Range	800 to 1600		V
$T_{Stg}$	Range	-40 to 150		$^{\circ}C$
$T_J$				

### 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
VS-90-110MT..K	80	800	900	10
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	
	160	1600	1700	



<b>FORWARD CONDUCTION</b>							
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 reapplied	Initial $T_J = T_J$ maximum	A		
		t = 8.3 ms				770	950
		t = 10 ms				810	1000
		t = 8.3 ms				650	800
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied	$T_J = T_J$ maximum	A <sup>2</sup> s		
		t = 8.3 ms				3000	4500
		t = 10 ms				2700	4100
		t = 8.3 ms				2100	3200
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied	100 % $V_{RRM}$ reapplied	$T_J = T_J$ maximum	A <sup>2</sup> √s		
						30 000	45 000
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	mΩ		
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 $t_p = 400$ μs 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				

<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>					
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	°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 ± 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
Approximate weight			3 to 4		
			176		g

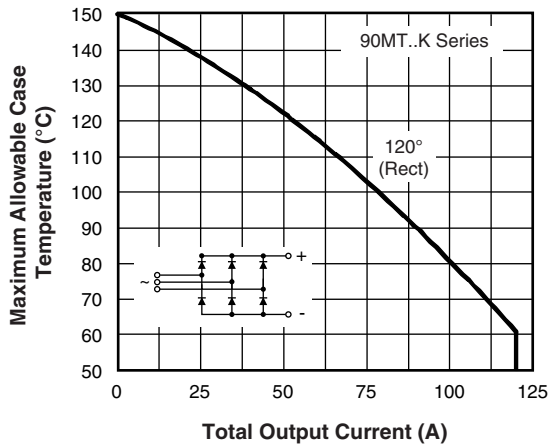


Fig. 1 - Current Ratings Characteristics

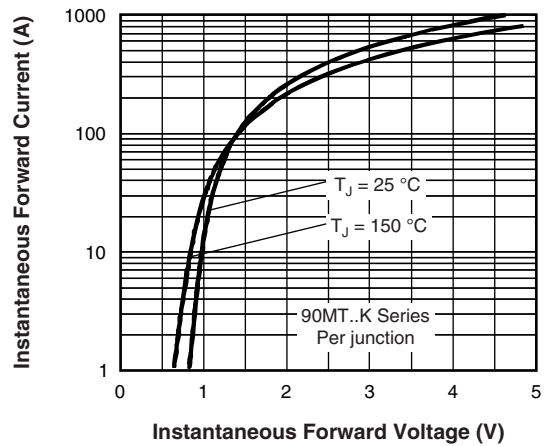


Fig. 2 - Forward Voltage Drop Characteristics

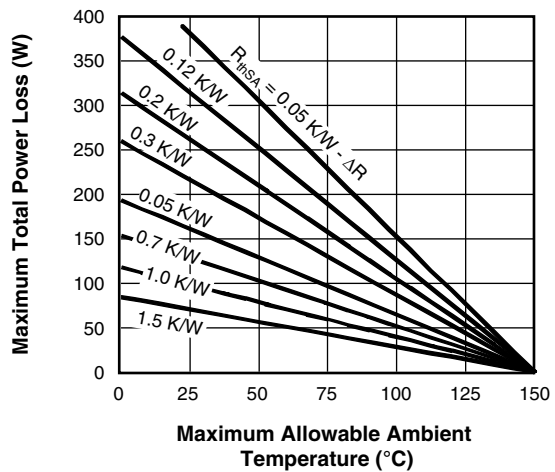
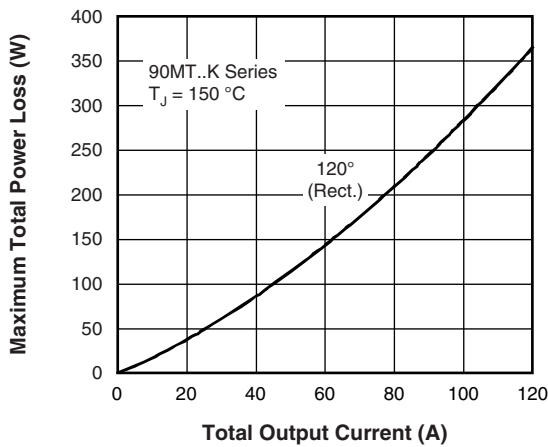


Fig. 3 - Total Power Loss Characteristics

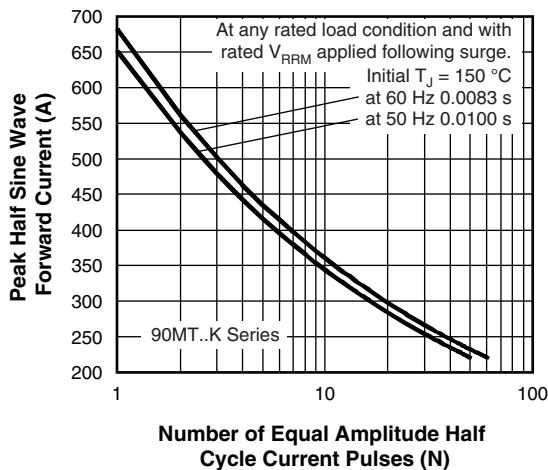


Fig. 4 - Maximum Non-Repetitive Surge Current

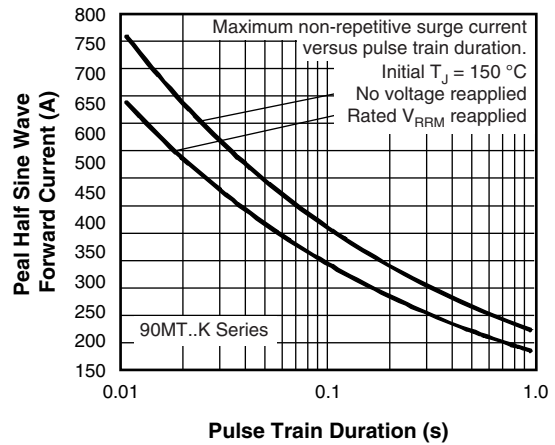


Fig. 5 - Maximum Non-Repetitive Surge Current

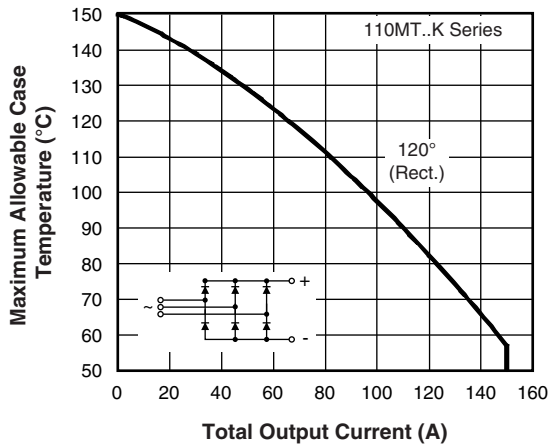


Fig. 6 - Current Ratings Characteristics

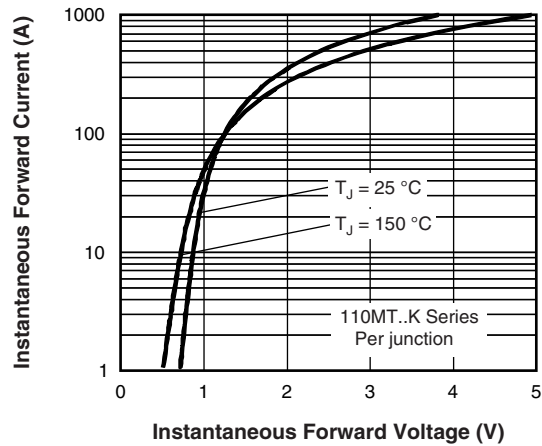


Fig. 7 - Forward Voltage Drop Characteristics

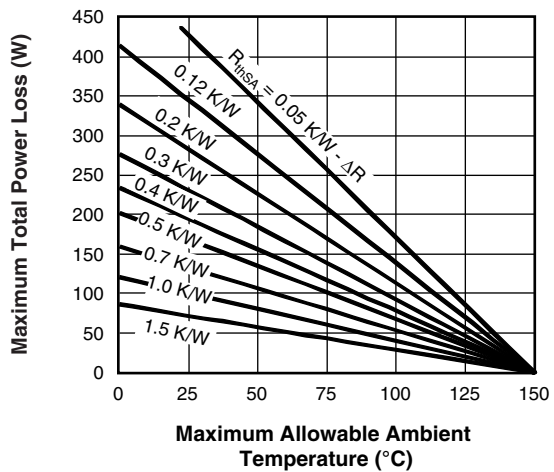
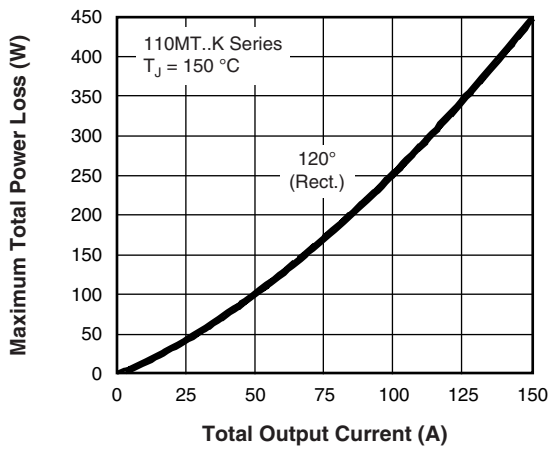


Fig. 8 - Total Power Loss Characteristics

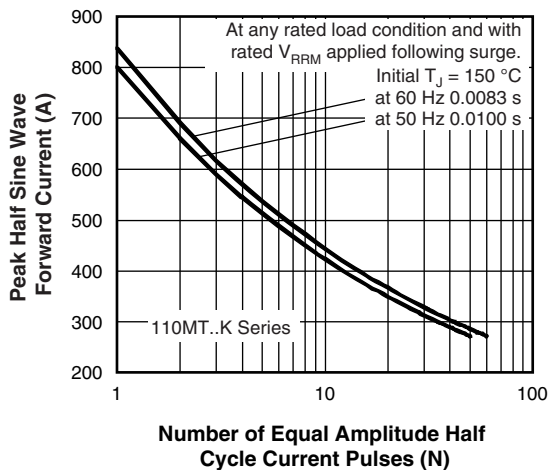


Fig. 9 - Maximum Non-Repetitive Surge Current

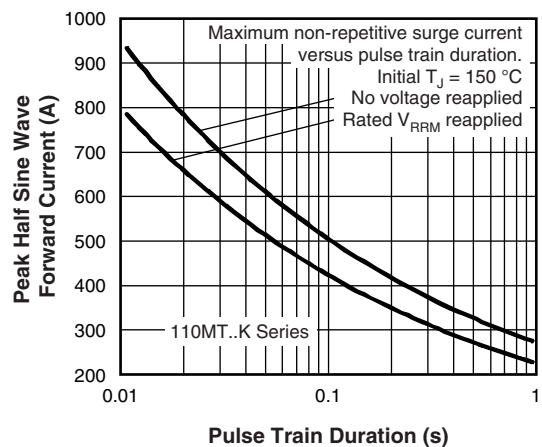


Fig. 10 - Maximum Non-Repetitive Surge Current

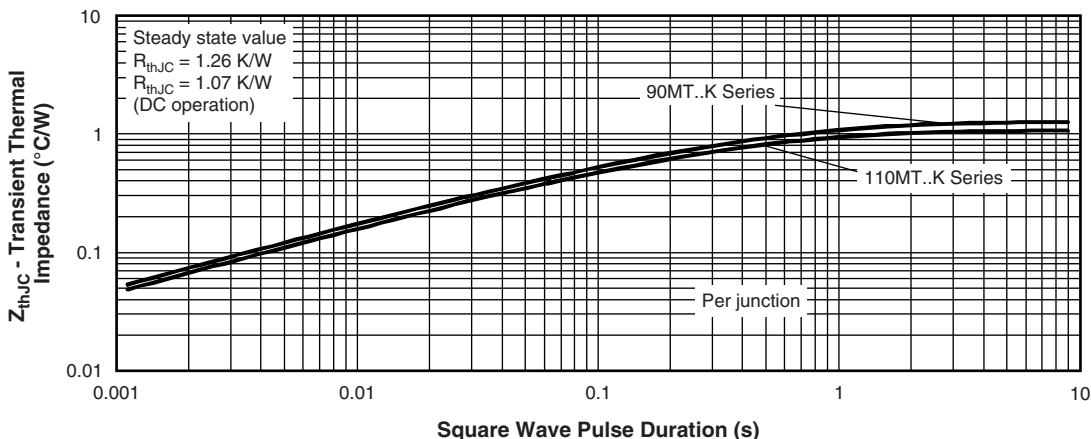


Fig. 11 - Thermal Impedance  $Z_{thJC}$  Characteristic

**ORDERING INFORMATION TABLE**

Device code	VS-	11	0	MT	160	K	PbF
	①	②	③	④	⑤	⑥	⑦

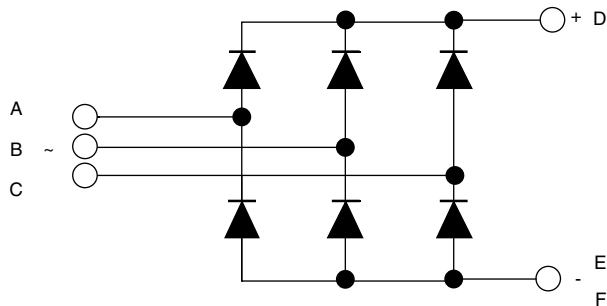
  

<b>1</b>	- Vishay Semiconductors product
<b>2</b>	- Current rating code: 9 = 90 A (average) 11 = 110 A (average)
<b>3</b>	- Three phase diodes bridge
<b>4</b>	- Essential part number
<b>5</b>	- Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)
<b>6</b>	- PbF = Lead (Pb)-free

**Note**

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

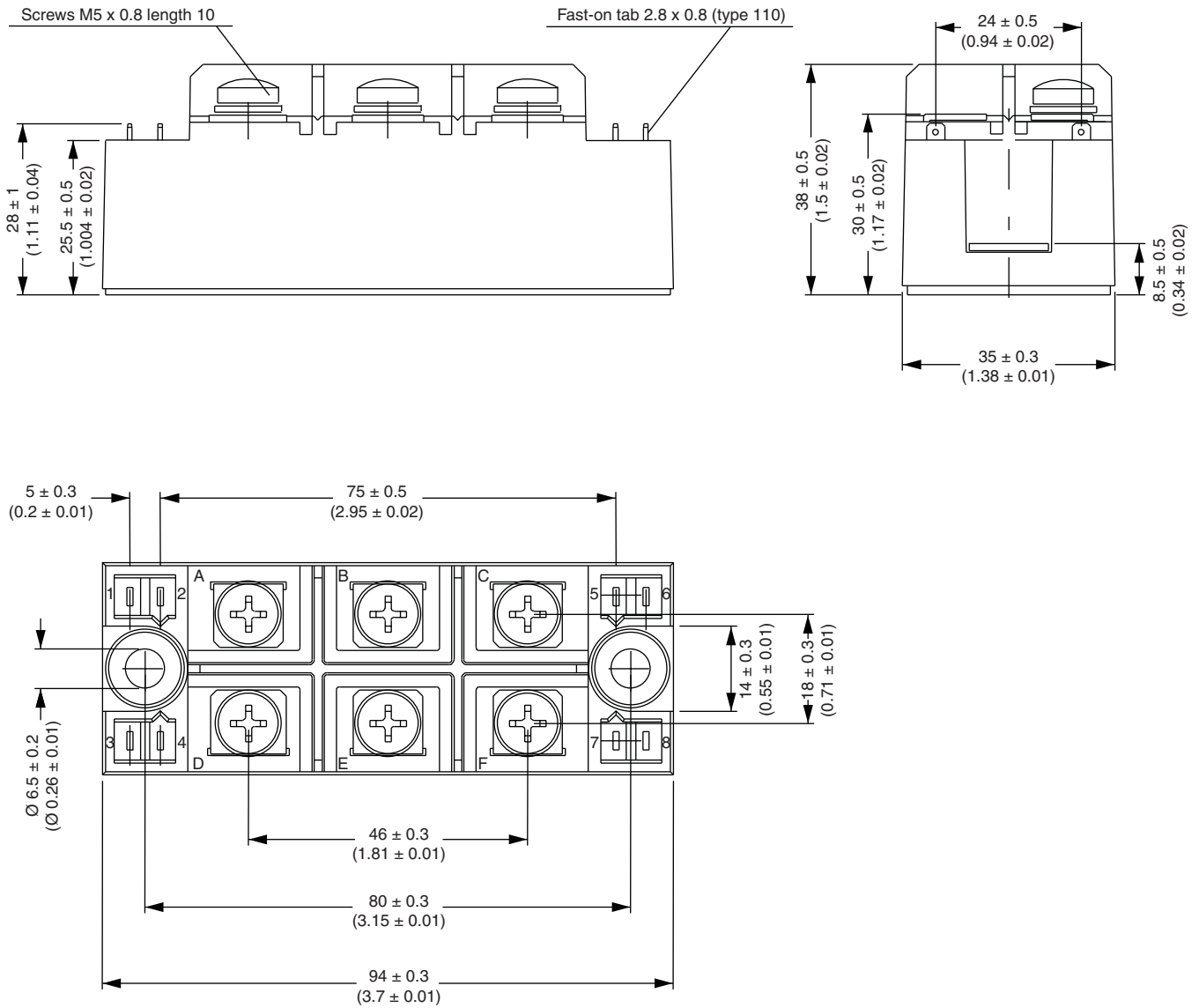
**CIRCUIT CONFIGURATION**



LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95004">www.vishay.com/doc?95004</a>

## MTK (with and without optional barrier)

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

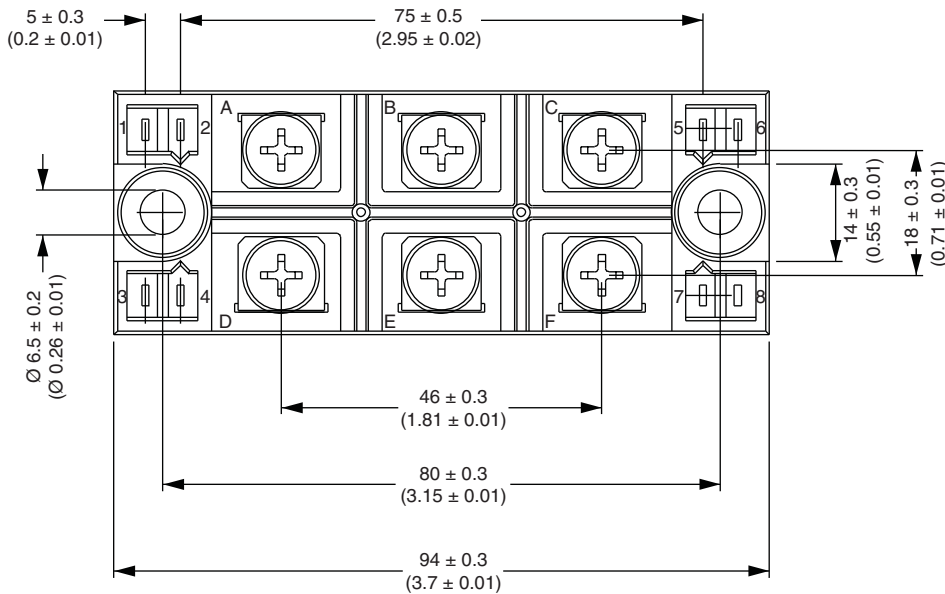
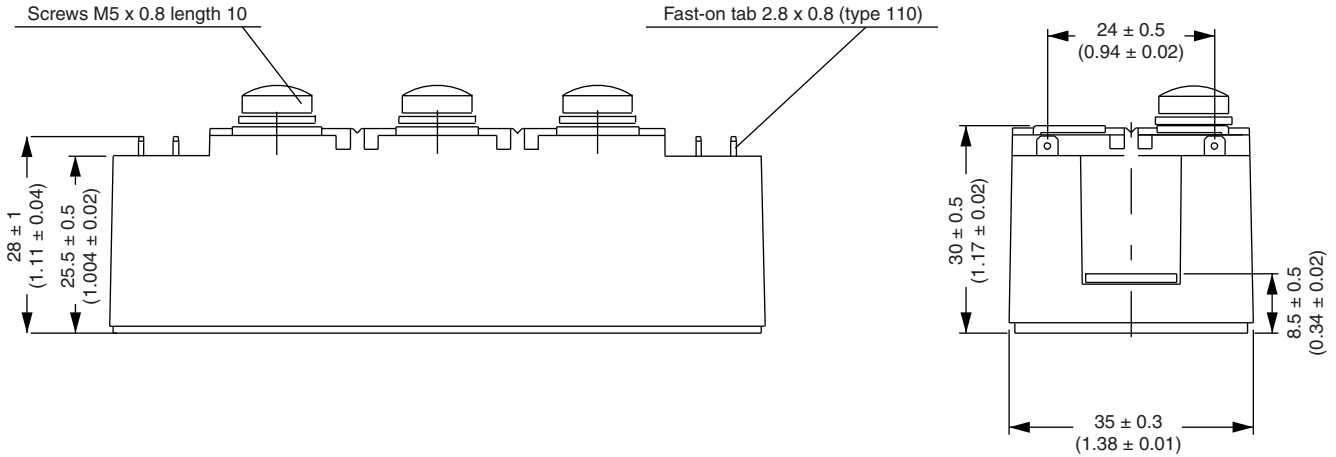


# Outline Dimensions

Vishay Semiconductors MTK (with and without optional barrier)



## DIMENSIONS WITHOUT OPTIONAL BARRIERS in millimeters (inches)





## Disclaimer

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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

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- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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**Факс:** 8 (812) 320-02-42

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