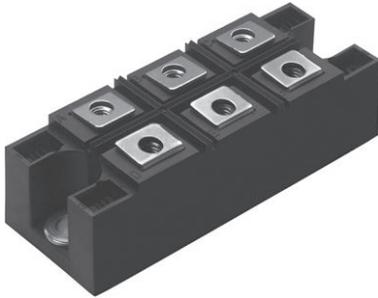


## Three Phase Bridge (Power Modules), 40 A



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
- 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

PRIMARY CHARACTERISTICS	
$I_o$	40 A
$V_{RRM}$	1600 V
Package	MTK
Circuit configuration	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	VALUES	UNITS
$I_o$		40 (50)	A
	$T_c$	85 (60)	°C
$I_{FSM}$	50 Hz	270	A
	60 Hz	280	
$I^2t$	50 Hz	365	kA <sup>2</sup> s
	60 Hz	325	
$I^2\sqrt{t}$		3650	kA <sup>2</sup> √s
$V_{RRM}$		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
40MT..K	160	1600	1700	10



FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum DC output current at case temperature	I <sub>O</sub>	120° rect. conduction angle		40 (50)	A
				85 (60)	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	270	A
		t = 8.3 ms		100 % V <sub>RRM</sub> reapplied	
		t = 10 ms	Initial		
		t = 8.3 ms		T <sub>J</sub> = T <sub>J</sub> maximum	
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied	365	kA <sup>2</sup> s
		t = 8.3 ms		100 % V <sub>RRM</sub> reapplied	
		t = 10 ms	Initial		
		t = 8.3 ms		T <sub>J</sub> = T <sub>J</sub> maximum	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied		3650	A <sup>2</sup> √s
Low level value of threshold voltage	V <sub>F(TO)1</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum		0.78	V
High level value of threshold voltage	V <sub>F(TO)2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum		0.9	
Low level value of forward slope resistance	r <sub>f1</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum		15	mΩ
High level value of forward slope resistance	r <sub>f2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum		14.1	
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 100 A, T <sub>J</sub> = 25 °C, t <sub>p</sub> = 400 μs single junction		2.02	V
RMS isolation voltage	V <sub>ISOL</sub>	T <sub>J</sub> = 25 °C, all terminal shorted f = 50 Hz, t = 1 s		4000	

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction operating and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>			-40 to +150	°C
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation per module		0.41	K/W
		DC operation per junction		2.46	
		120° rect. conduction angle per module		0.45	
		120° rect. conduction angle per junction		2.7	
Maximum thermal resistance, case to heatsink per module	R <sub>thCS</sub>	Mounting surface smooth, flat and greased		0.03	
Mounting torque ± 10 %	to heatsink	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
	to terminal			3 to 4	
Approximate weight				176	g

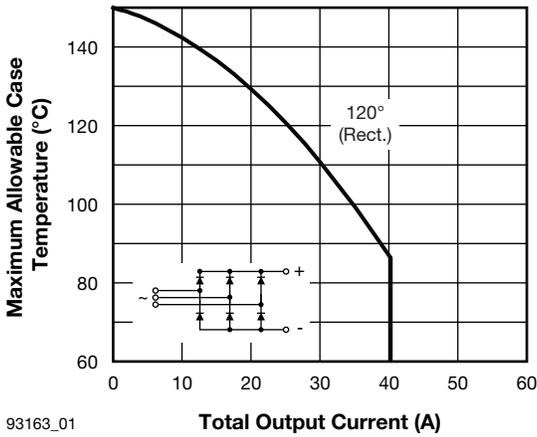


Fig. 1 - Current Ratings Characteristics

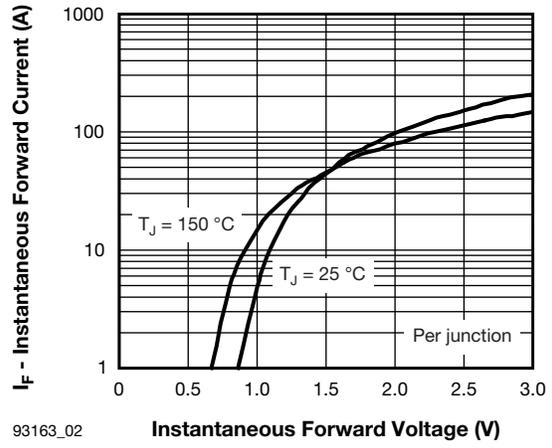


Fig. 2 - Forward Voltage Drop Characteristics

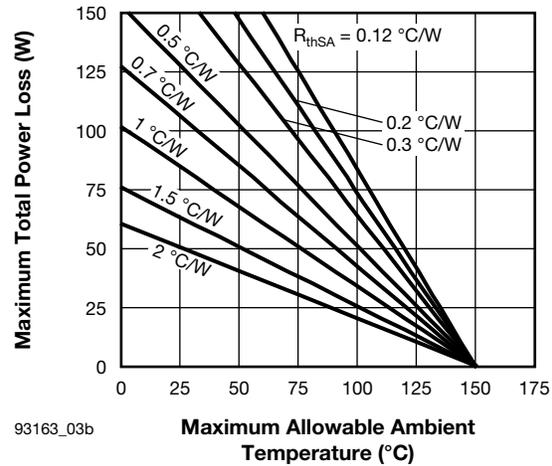
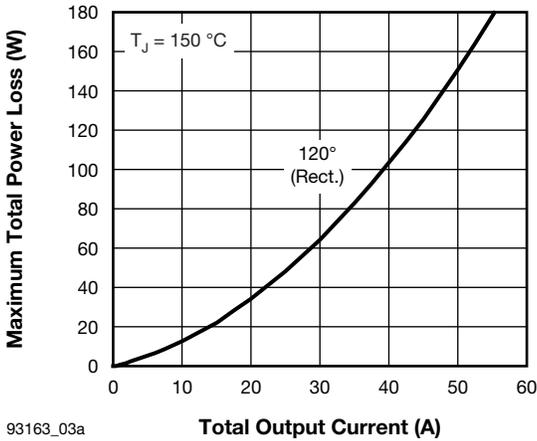


Fig. 3 - Total Power Loss Characteristics

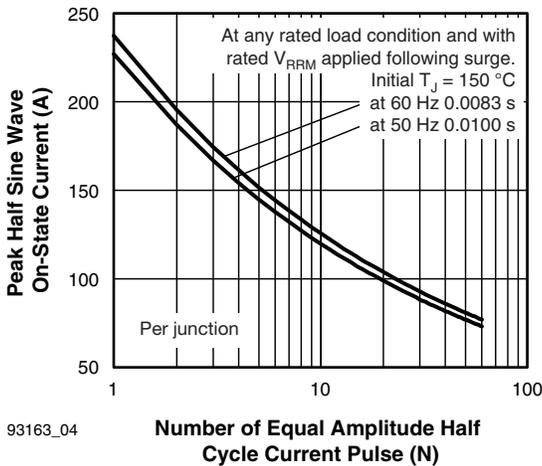


Fig. 4 - Maximum Non-Repetitive Surge Current

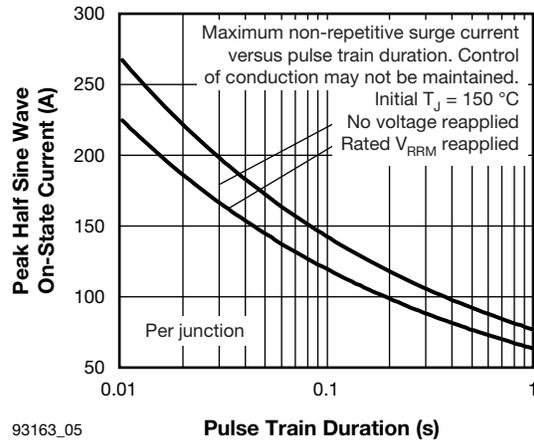
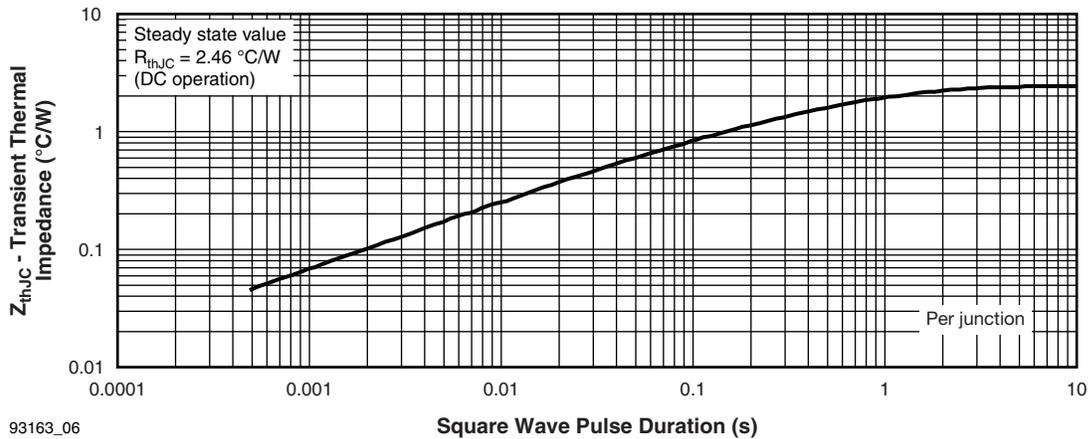


Fig. 5 - Maximum Non-Repetitive Surge Current



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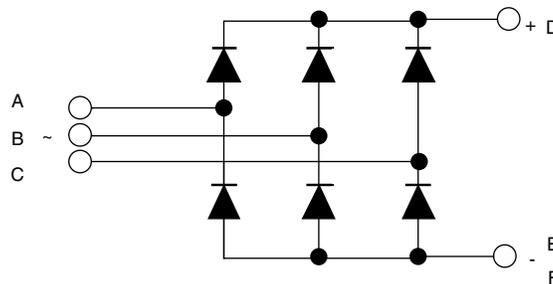
 Fig. 6 - Thermal Impedance  $Z_{thJC}$  Characteristics

**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>4</b>	<b>0</b>	<b>MT</b>	<b>160</b>	<b>K</b>	<b>PbF</b>
	①	②	③	⑤	⑥		⑦
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
	-	-	-	-	-	-	
	Vishay Semiconductors product	Current rating code: 4 = 40 A (average)	Three phase diodes bridge	Essential part number	Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)	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>
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