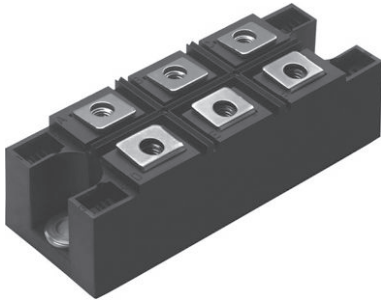


## Three Phase Bridge (Power Modules), 40 A



MTK


**RoHS**  
COMPLIANT

### 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)

### 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.

PRIMARY CHARACTERISTICS	
$I_o$	40 A
$V_{RRM}$	1600 V
Package	MTK
Circuit configuration	Three phase bridge

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
$T_J$			

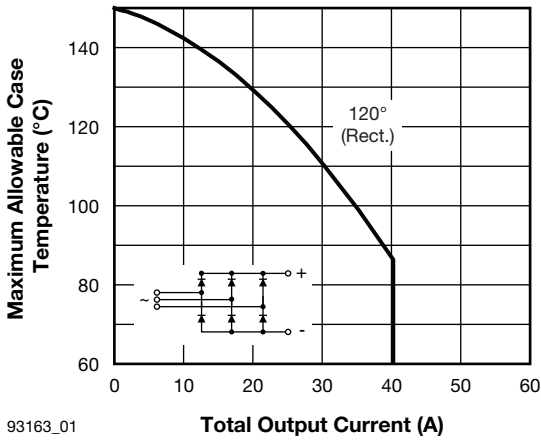
### ELECTRICAL SPECIFICATIONS

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



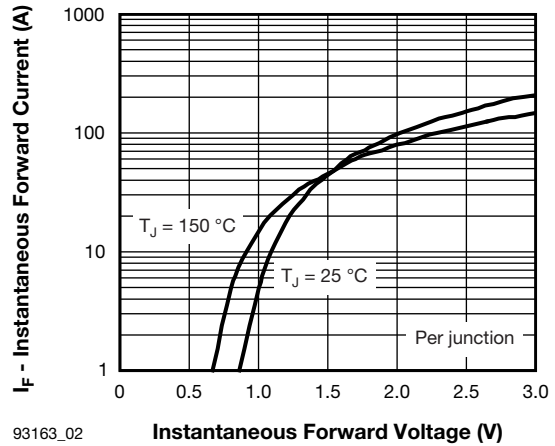
FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum DC output current at case temperature	I <sub>O</sub>	120° rect. conduction angle		40 (50)	A
				85 (60)	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	270	A
		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



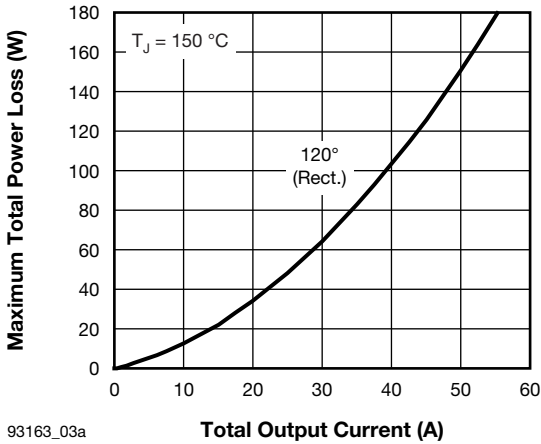
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**Fig. 1 - Current Ratings Characteristics**

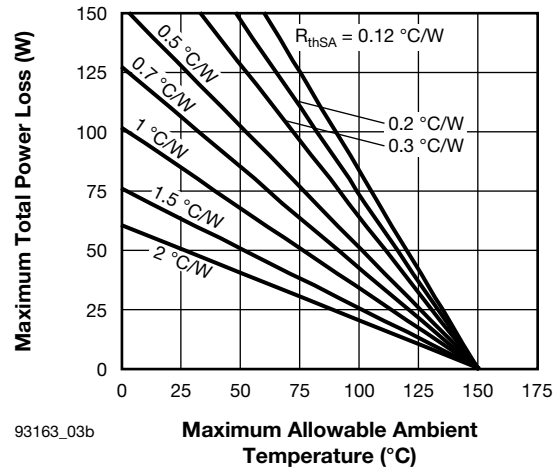


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**Fig. 2 - Forward Voltage Drop Characteristics**

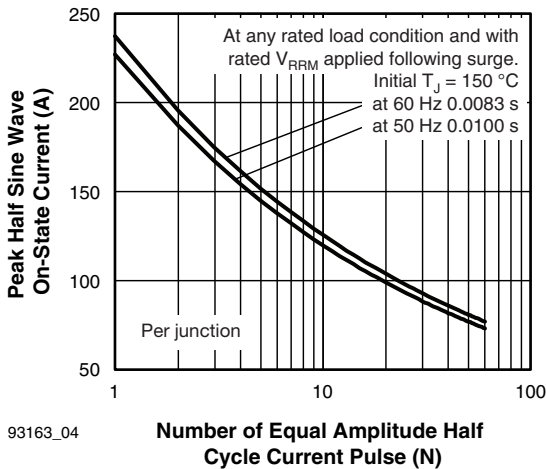


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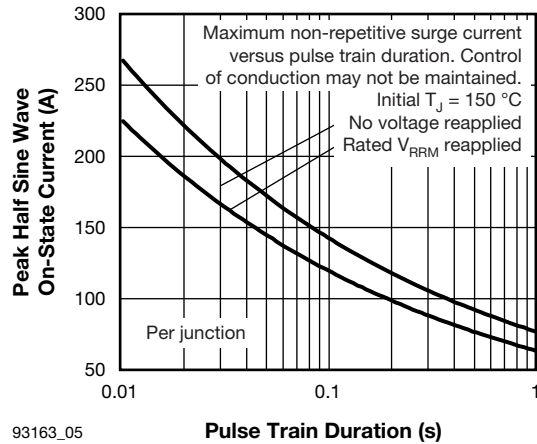
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**Fig. 3 - Total Power Loss Characteristics**



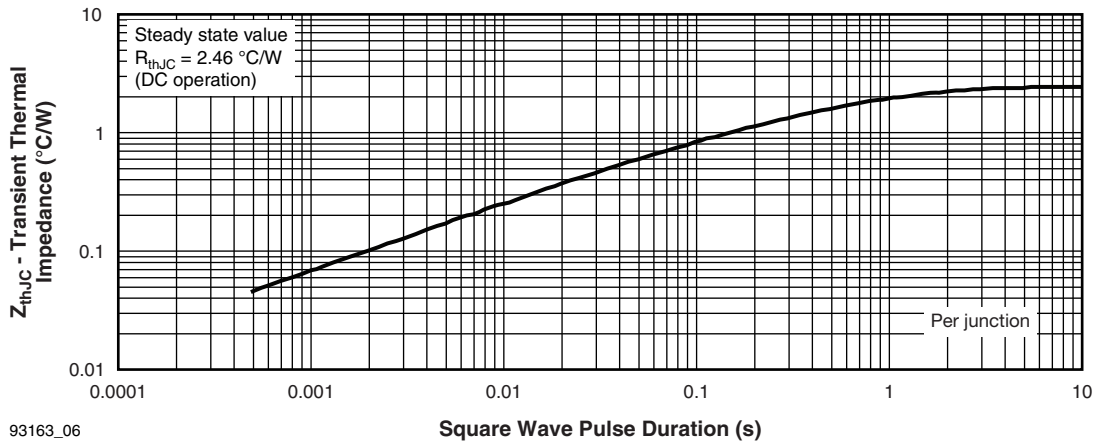
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**Fig. 4 - Maximum Non-Repetitive Surge Current**



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**Fig. 5 - Maximum Non-Repetitive Surge Current**


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

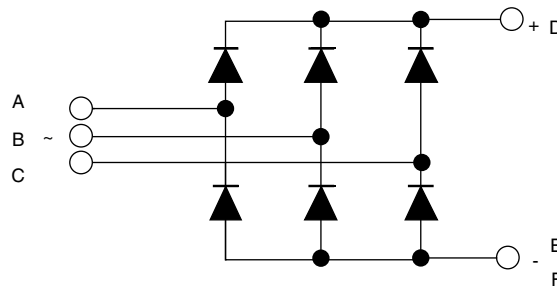
**ORDERING INFORMATION TABLE**

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

- 1** - Vishay Semiconductors product
- 2** - Current rating code: 4 = 40 A (average)
- 3** - Three phase diodes bridge
- 4** - Essential part number
- 5** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 6** - 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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