

## Three Phase Bridge, 160 A (Power Modules)


**MTC**
**FEATURES**

- Blocking voltage up to 1800 V
- High surge capability
- High thermal conductivity package, electrically insulated case
- Excellent power volume ratio
- 3600 V<sub>RMS</sub> isolating voltage
- UL pending
- Designed 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	
$I_O$	160 A at 118 °C
$V_{RRM}$	1600 V to 1800 V
Package	MTC
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	VALUES	UNITS
$I_O^{(1)}$		257	A
	$T_C$	85	°C
$I_{FSM}$	50 Hz	1540	A
	60 Hz	1610	
$I^2t$	50 Hz	11 860	A <sup>2</sup> s
	60 Hz	10 825	
$I^2\sqrt{t}$		118 580	A <sup>2</sup> √s
$V_{RRM}$	Range	1600 to 1800	V
$T_{Stg}$	Range	-40 to +125	°C
$T_J$	Range	-40 to +150	°C

**Note**

(1) Maximum output current must be limited to 220 A to do not exceed the maximum temperature of terminals

**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-160MT...C	160	1600	1700	12
	180	1800	1900	



FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum DC output current at case temperature	I <sub>O</sub>	120° rect. conduction angle			160	A
					118	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	Initial T <sub>J</sub> = T <sub>J</sub> maximum	1540	A
		t = 8.3 ms			1610	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		1295	
		t = 8.3 ms			1355	
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied	Initial T <sub>J</sub> = T <sub>J</sub> maximum	11 860	A <sup>2</sup> s
		t = 8.3 ms			10 825	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		8385	
		t = 8.3 ms			7620	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied			118 580	A <sup>2</sup> √s
Low level value of threshold voltage	V <sub>FT(TO)1</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum			0.81	V
High level value of threshold voltage	V <sub>FT(TO)2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum			0.98	
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			3.89	mΩ
High level of forward slope resistance	r <sub>f2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum			3.68	
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 300 A, T <sub>J</sub> = 25 °C, per junction			1.85	V
RMS isolation voltage	V <sub>ISOL</sub>	T <sub>J</sub> = 25 °C, all terminal shorted f = 50 Hz, t = 1 s			3600	

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum junction operating	T <sub>J</sub>				-40 to +150	°C
Maximum storage temperature	T <sub>Stg</sub>				-40 to +125	
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation per module			0.058	°C/W
		DC operation per junction			0.35	
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	Per module Mounting surface smooth, flat, and greased			0.03	
Mounting torque ± 15 %	to heatsink	A mounting compound is recommended and the torque should be rechecked after a period of 3 h to allow for the spread of the compound. Lubricated threads.			5	Nm
	to terminal				5	
Approximate weight					235	g

ΔR CONDUCTION PER JUNCTION											
DEVICES	SINE HALF WAVE CONDUCTION					RECTANGULAR WAVE CONDUCTION					UNITS
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
VS-160MT...C Series	0.054	0.061	0.076	0.107	0.165	0.039	0.064	0.083	0.111	0.167	°C/W

**Note**

- Table shows the increment of thermal resistance R<sub>thJC</sub> when devices operate at different conduction angles than DC

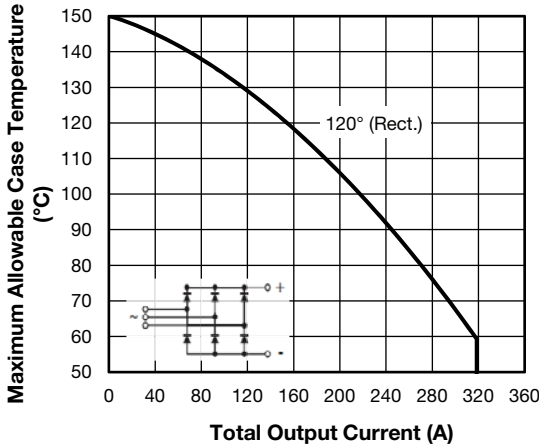


Fig. 1 - Current Ratings Characteristics

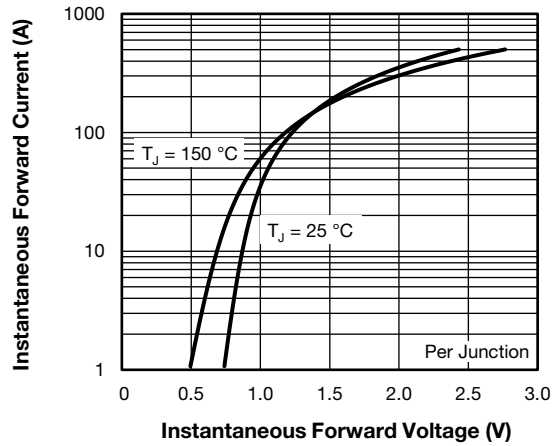


Fig. 2 - Forward Voltage Drop Characteristics

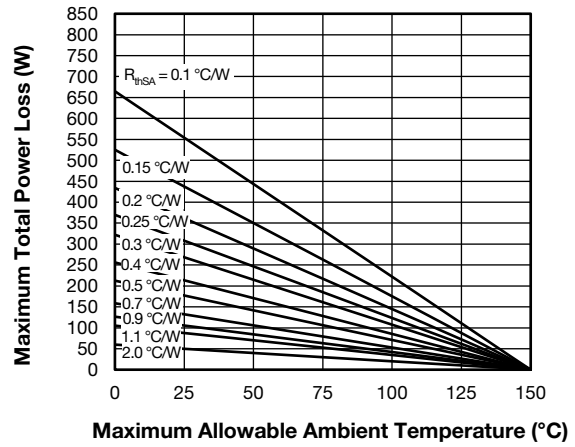
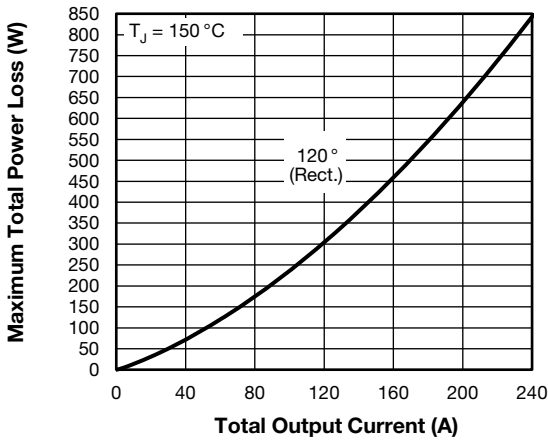


Fig. 3 - Total Power Loss Characteristics

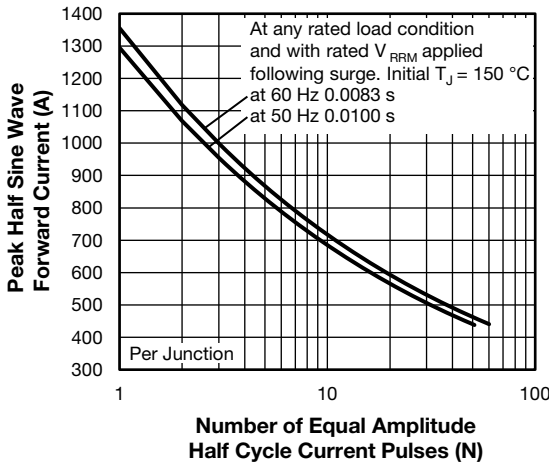


Fig. 4 - Maximum Non-Repetitive Surge Current

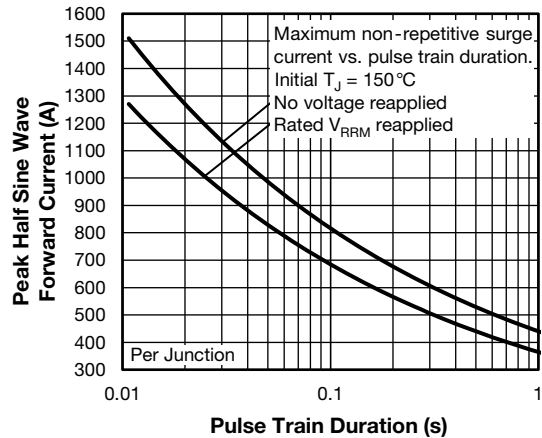


Fig. 5 - Maximum Non-Repetitive Surge Current

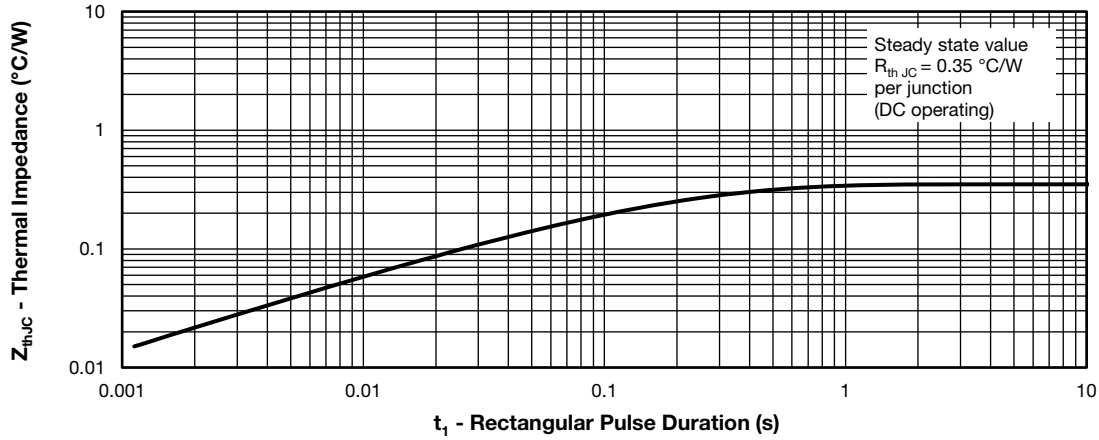
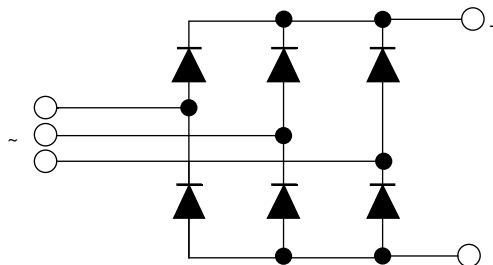


Fig. 6 - Thermal Impedance  $Z_{thJC}$  Characteristic

**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>16</b>	<b>0</b>	<b>MT</b>	<b>160</b>	<b>C</b>
	①	②	③	④	⑤	
	<b>1</b>	-	Vishay Semiconductors product			
	<b>2</b>	-	Current rating code: 16 = 160 A (average)			
	<b>3</b>	-	Circuit configuration (three phase diodes bridge)			
	<b>4</b>	-	Package indicator			
	<b>5</b>	-	Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)			

**CIRCUIT CONFIGURATION**



LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96003">www.vishay.com/doc?96003</a>



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