




## 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 approved file E78996 
- 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

### 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

$I_O$	160 A at 118 °C
$V_{RRM}$	1600 V to 1800 V
Package	MTC
Circuit configuration	Three phase bridge

### 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		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 % x π x I <sub>F(AV)</sub> < I < π x 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 x 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 % x π x I <sub>F(AV)</sub> < I < π x 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 x 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

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  $R_{thJC}$  when devices operate at different conduction angles than DC

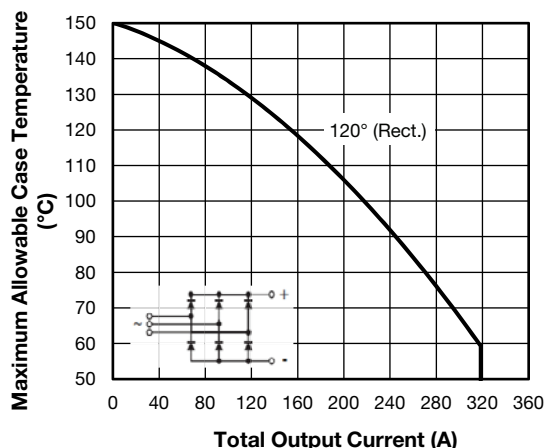


Fig. 1 - Current Ratings Characteristics

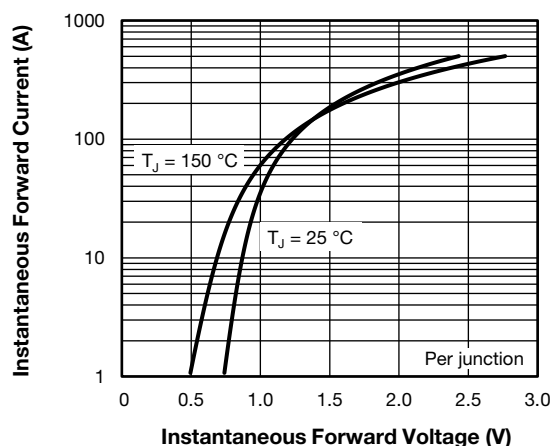


Fig. 2 - Forward Voltage Drop Characteristics

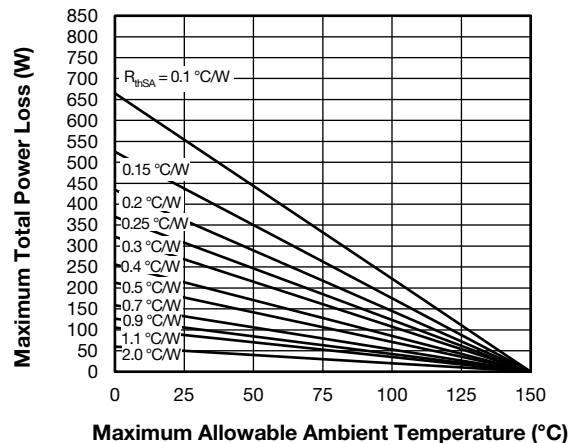
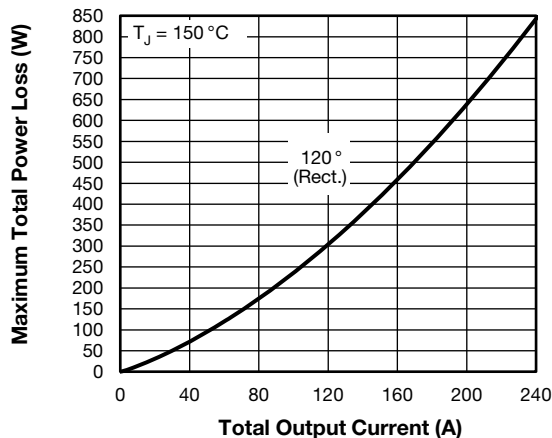


Fig. 3 - Total Power Loss Characteristics

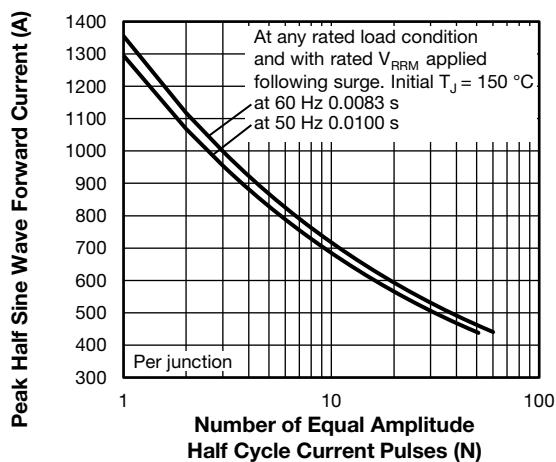


Fig. 4 - Maximum Non-Repetitive Surge Current

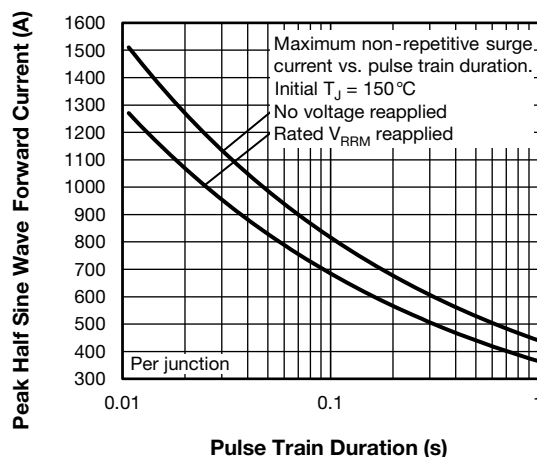


Fig. 5 - Maximum Non-Repetitive Surge Current

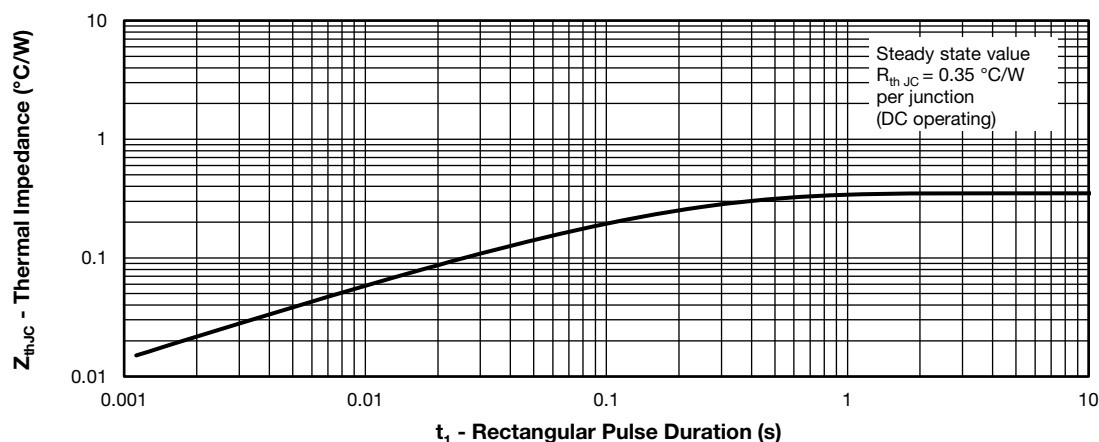
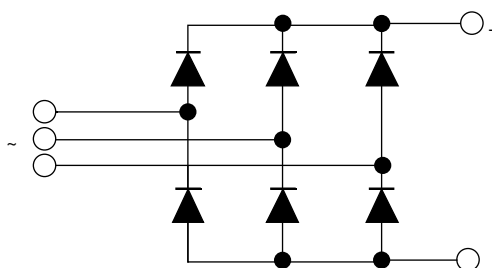


Fig. 6 - Thermal Impedance  $Z_{thJC}$  Characteristic

## ORDERING INFORMATION TABLE

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

## CIRCUIT CONFIGURATION

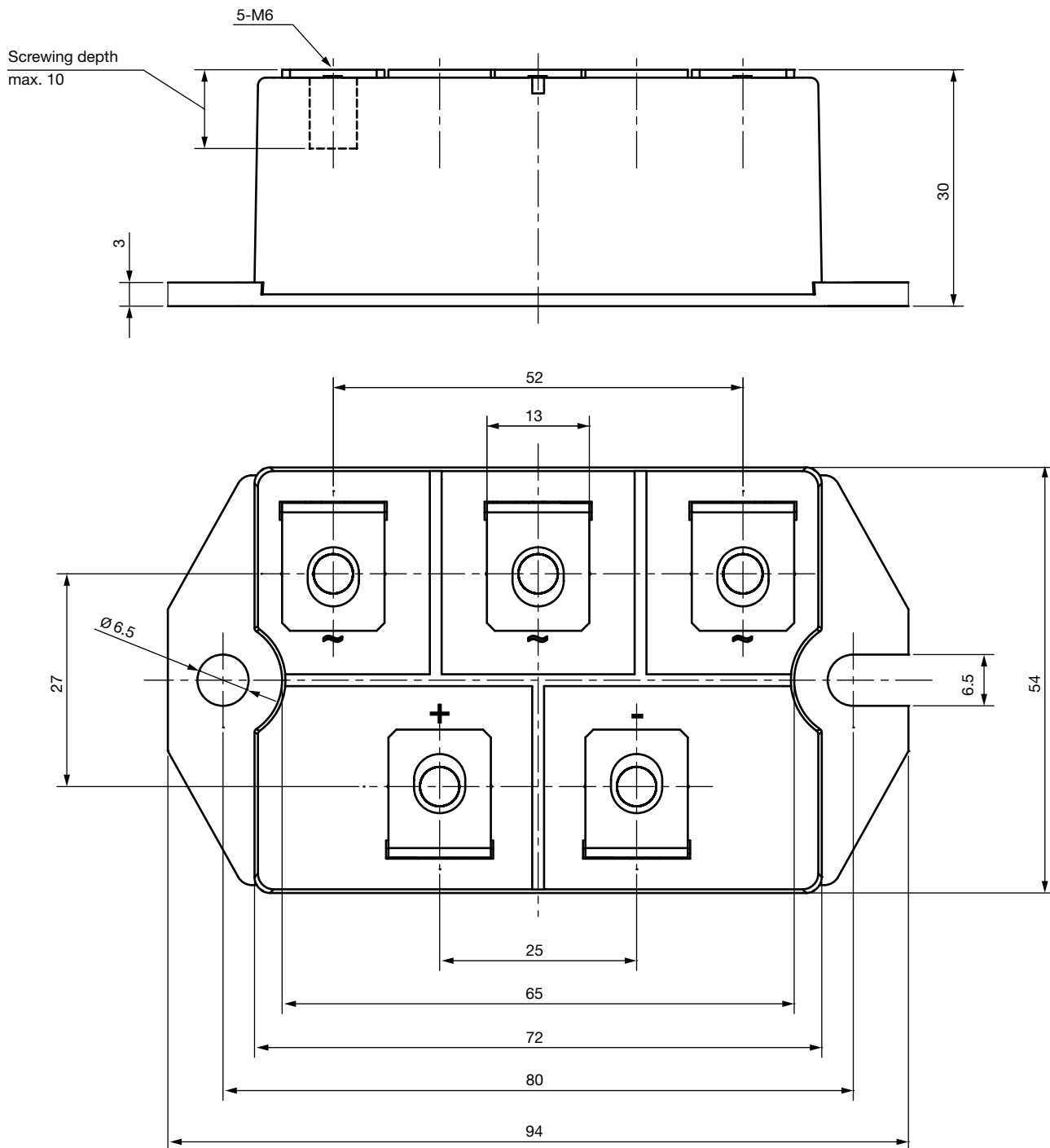


LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96003">www.vishay.com/doc?96003</a>



## MTC

**DIMENSIONS** in millimeters





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