

## Three Phase Bridge, 300 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**

PRIMARY CHARACTERISTICS	
$I_o$	300 A at 100 °C
$V_{RRM}$	1600 V to 1800 V
Package	MTC
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
$I_o^{(1)}$		258	A
	$T_c$	110	°C
$I_{FSM}$	50 Hz	2400	A
	60 Hz	2512	
$I^2t$	50 Hz	28 795	A <sup>2</sup> s
	60 Hz	26 285	
$I^2\sqrt{t}$		287 955	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**

<sup>(1)</sup> Maximum output current must be limited to 250 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 $T_J = \text{MAXIMUM}$ mA
VS-300MT...C	160	1600	1700	12
	180	1800	1900	



FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum DC output current at case temperature	$I_O$	120° rect. conduction angle		300	A
				100	°C
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reapplied	2400	A
		t = 8.3 ms		2512	
		t = 10 ms	100 % $V_{RRM}$ reapplied	2018	
		t = 8.3 ms		2113	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied	28 795	A <sup>2</sup> s
		t = 8.3 ms		26 285	
		t = 10 ms	100 % $V_{RRM}$ reapplied	20 360	
		t = 8.3 ms		18 590	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied		287 955	A <sup>2</sup> √s
Low level value of threshold voltage	$V_{FT(TO)1}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J$ maximum		0.79	V
High level value of threshold voltage	$V_{FT(TO)2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J$ maximum		0.96	
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		3.36	mΩ
High level of forward slope resistance	$r_{f2}$	(I > $\pi \times I_{F(AV)}$ ), $T_J$ maximum		3.22	
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 240$ A, $T_J = 25$ °C, per junction		1.54	V
		$I_{pk} = 300$ A, $T_J = 25$ °C, per junction		1.7	
RMS isolation voltage	$V_{ISOL}$	$T_J = 25$ °C, all terminal shorted f = 50 Hz, t = 1 s		3600	

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction operating	$T_J$			-40 to +150	°C
Maximum storage temperature	$T_{Stg}$			-40 to +125	
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation per module		0.038	°C/W
		DC operation per junction		0.23	
Typical thermal resistance, case to heat sink	$R_{thCS}$	Per module Mounting surface smooth, flat, and greased		0.03	
Mounting torque $\pm 15$ % to heat sink 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.		5	Nm
				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-300MT...C Series	0.044	0.050	0.061	0.087	0.143	0.029	0.050	0.066	0.091	0.145	°C/W

**Note**

- Table shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC

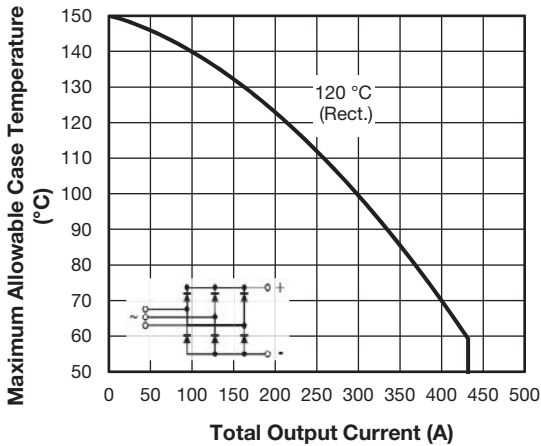


Fig. 1 - Current Rating Characteristics

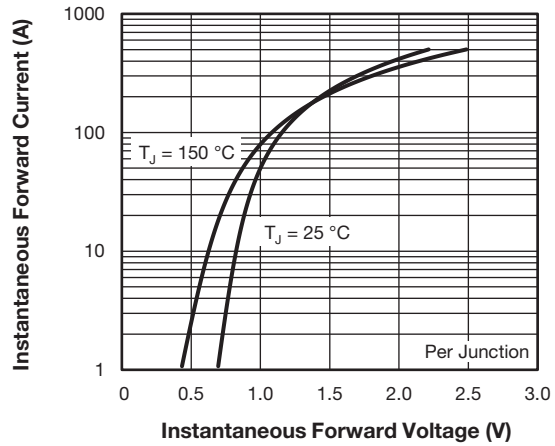


Fig. 2 - Forward Voltage Drop Characteristics

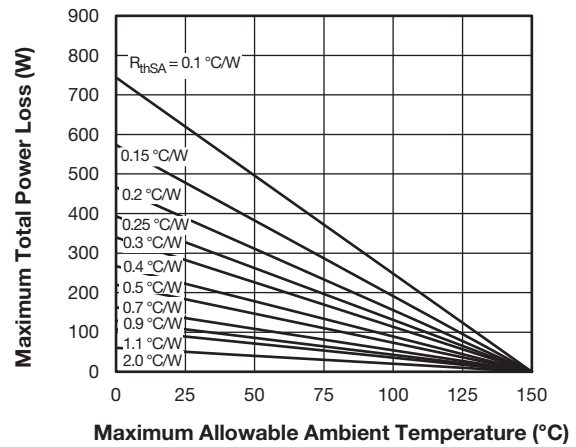
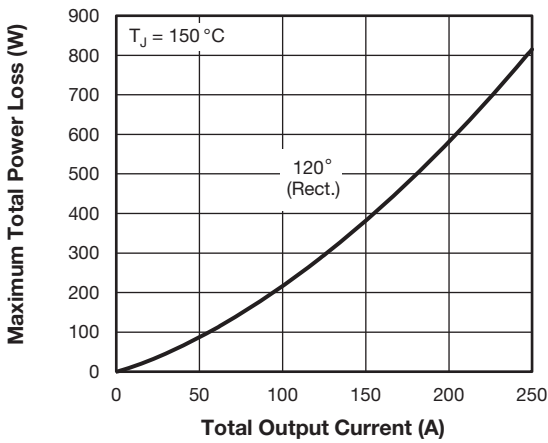


Fig. 3 - Total Power Loss Characteristics

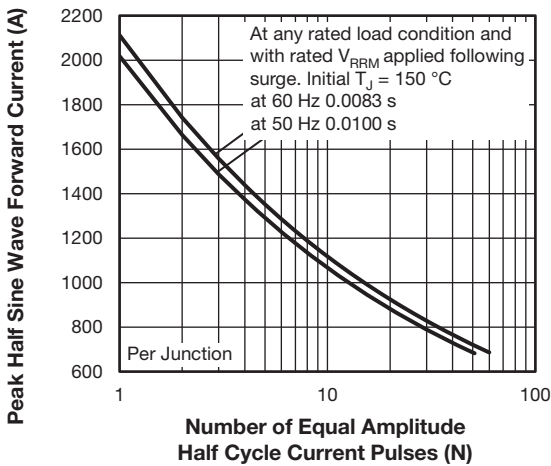


Fig. 4 - Maximum Non-Repetitive Surge Current

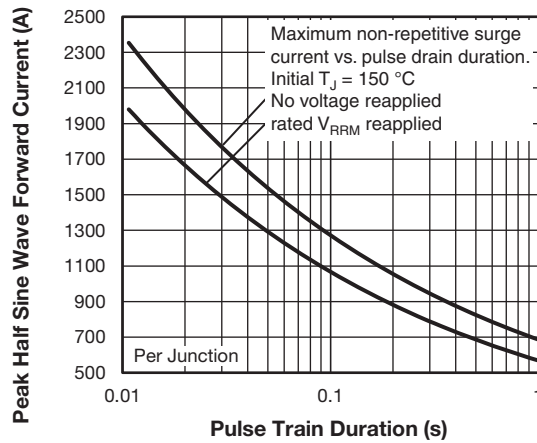


Fig. 5 - Maximum Non-Repetitive Surge Current

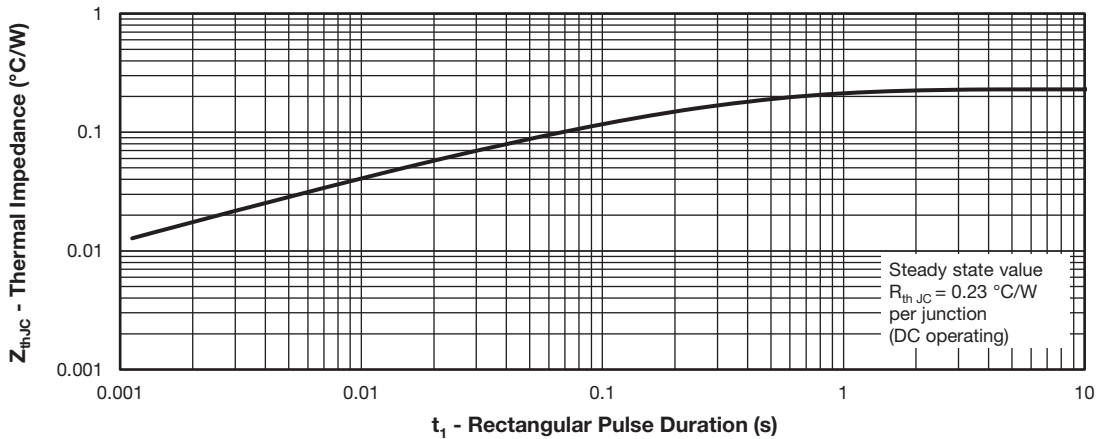


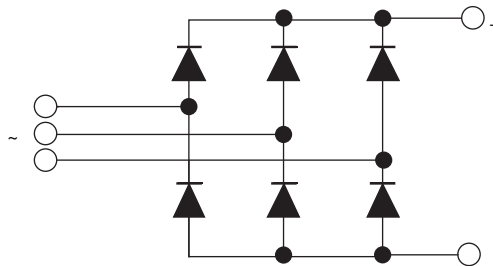
Fig. 6 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

Device code	VS-	30	0	MT	160	C
	①	②	③	④	⑤	

- 1** - Vishay Semiconductors product
- 2** - Current rating code: 30 = 300 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

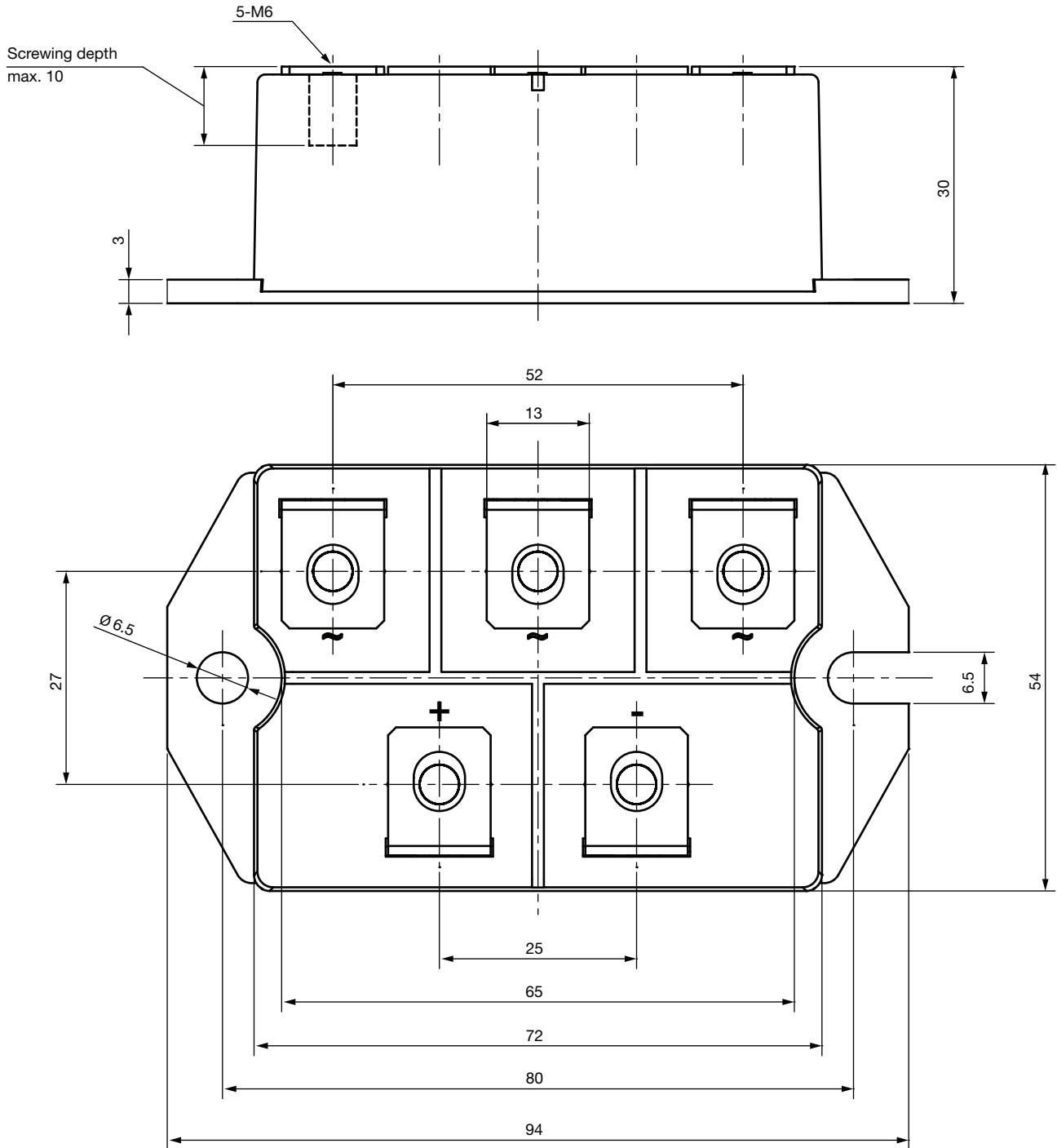


LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96003">www.vishay.com/doc?96003</a>



## MTC

**DIMENSIONS** in millimeters





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