

## 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
$I_o$ <sup>(1)</sup>		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 ± 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

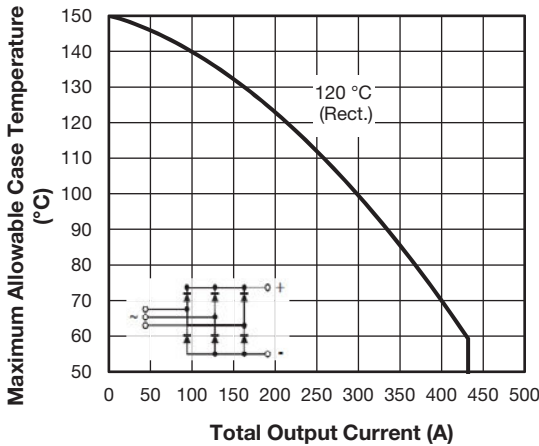


Fig. 1 - Current Rating Characteristics

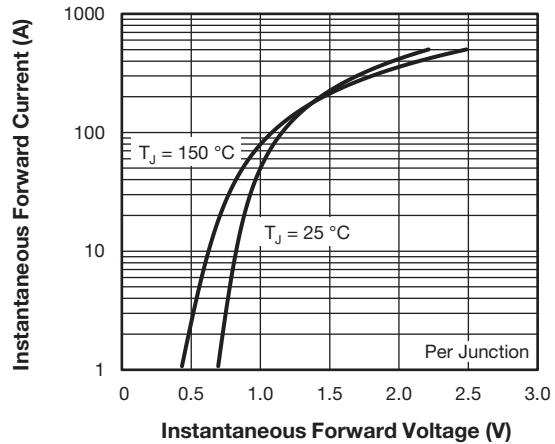


Fig. 2 - Forward Voltage Drop Characteristics

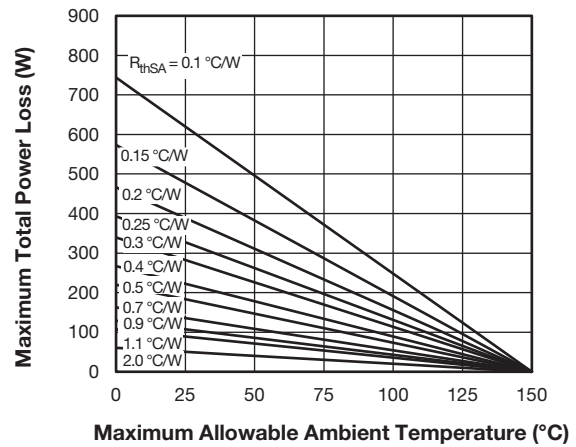
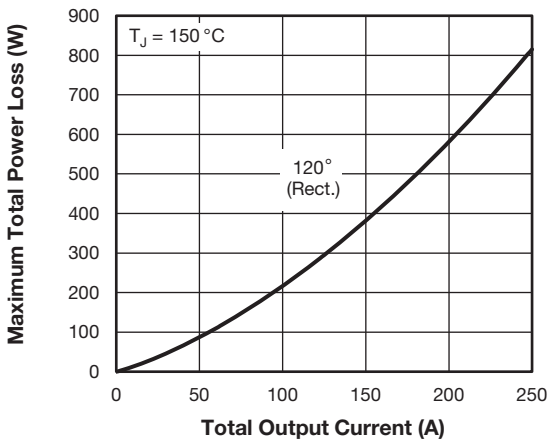


Fig. 3 - Total Power Loss Characteristics

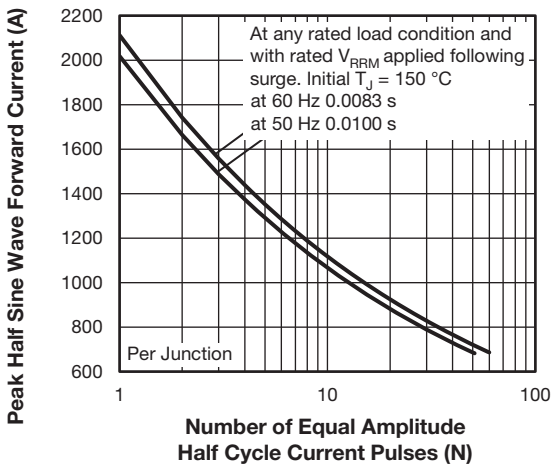


Fig. 4 - Maximum Non-Repetitive Surge Current

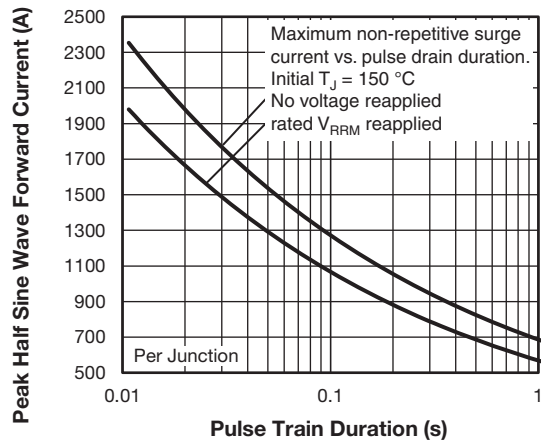


Fig. 5 - Maximum Non-Repetitive Surge Current

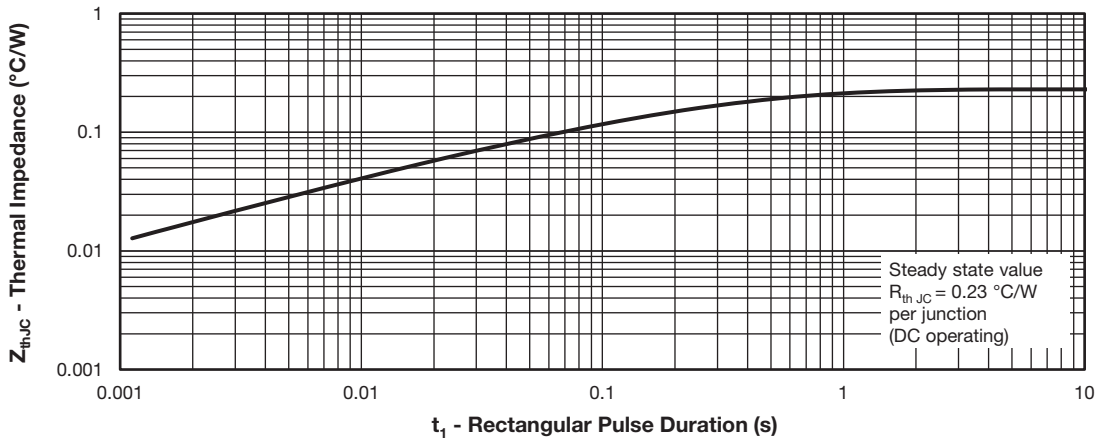


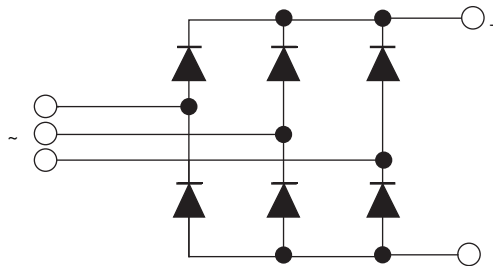
Fig. 6 - Thermal Impedance  $Z_{thJC}$  Characteristics

**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**

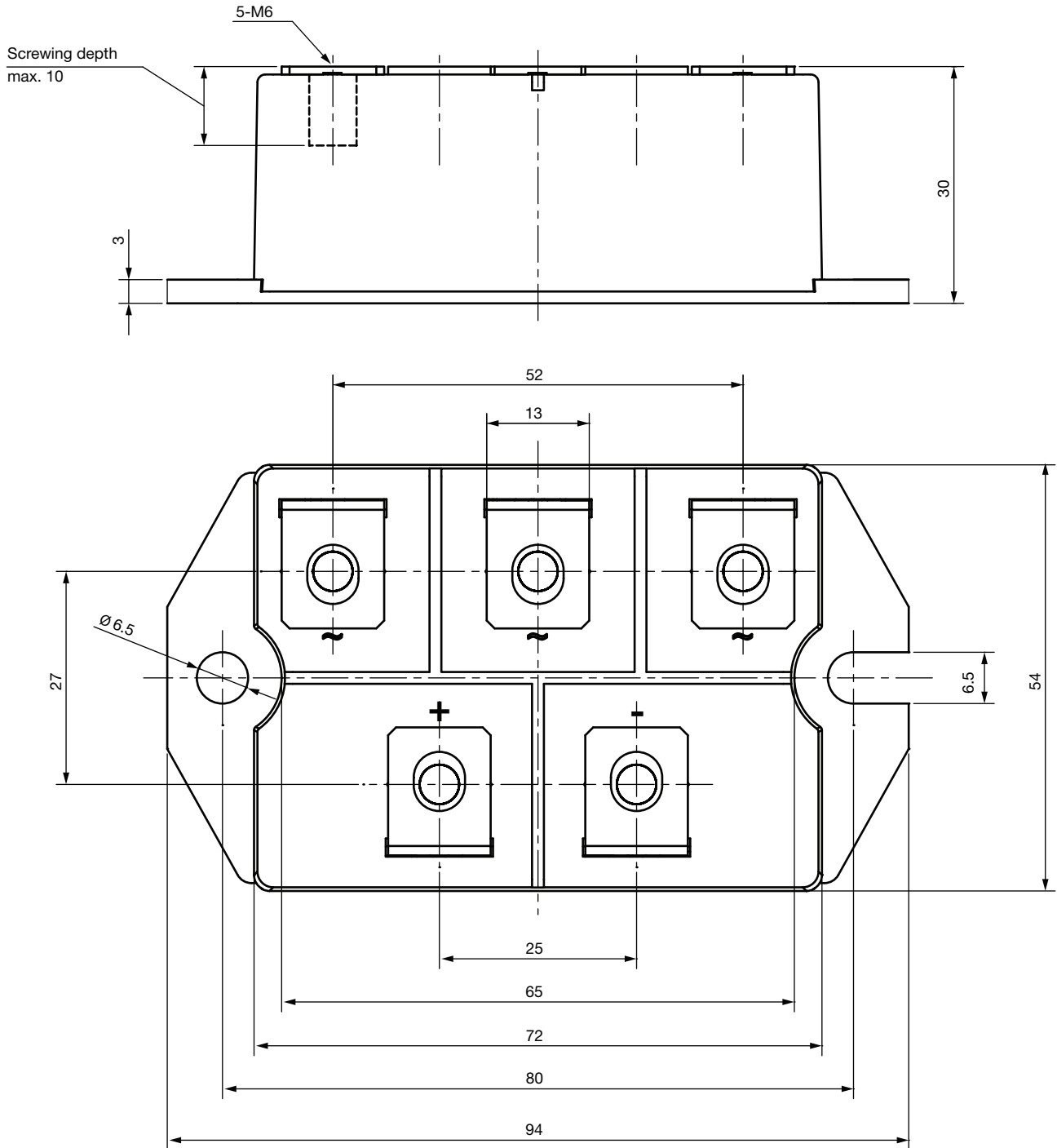


LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96003">www.vishay.com/doc?96003</a>



## MTC

**DIMENSIONS** in millimeters





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