

## Three Phase Bridge, 130 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	
$I_o$	130 A at 120 °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
$I_o^{(1)}$		218	A
	$T_c$	85	°C
$I_{FSM}$	50 Hz	1270	A
	60 Hz	1330	
$I^2t$	50 Hz	8095	A <sup>2</sup> s
	60 Hz	7390	
$I^2\sqrt{t}$		80 955	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 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-130MT...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		130	A
				120	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	1270	A
		t = 8.3 ms			
		t = 10 ms	100 % V <sub>RRM</sub> reapplied	1070	
		t = 8.3 ms			
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied	8095	A <sup>2</sup> s
		t = 8.3 ms			
		t = 10 ms	100 % V <sub>RRM</sub> reapplied	7390	
		t = 8.3 ms			
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied		80 955	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		0.79	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		0.96	
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		4.97	mΩ
High level of forward slope resistance	r <sub>f2</sub>	(I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum		4.63	
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 300 A, T <sub>J</sub> = 25 °C, per junction		2.05	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	0.068	°C/W
		DC operation per junction	0.41	
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-130MT...C Series	0.052	0.06	0.075	0.106	0.164	0.038	0.063	0.081	0.109	0.165	°C/W

**Note**

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

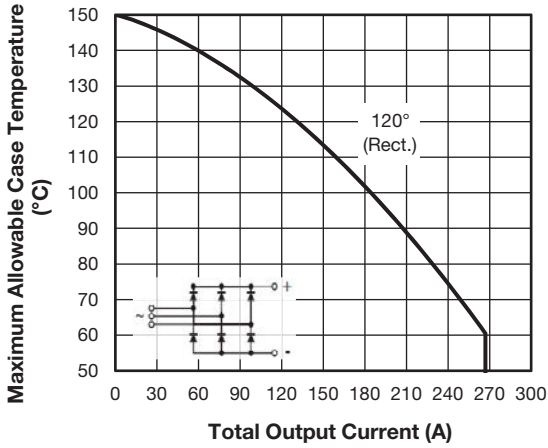


Fig. 1 - Current Ratings Characteristics

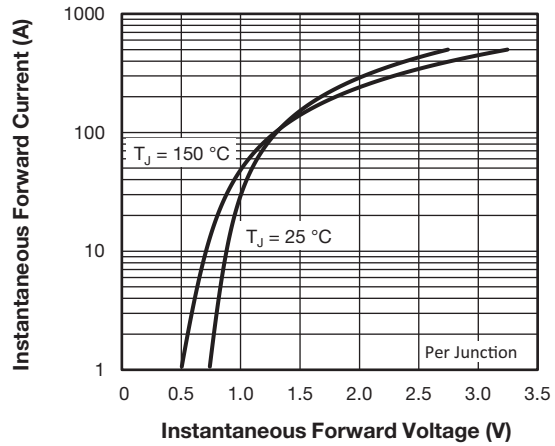


Fig. 2 - Forward Voltage Drop Characteristics

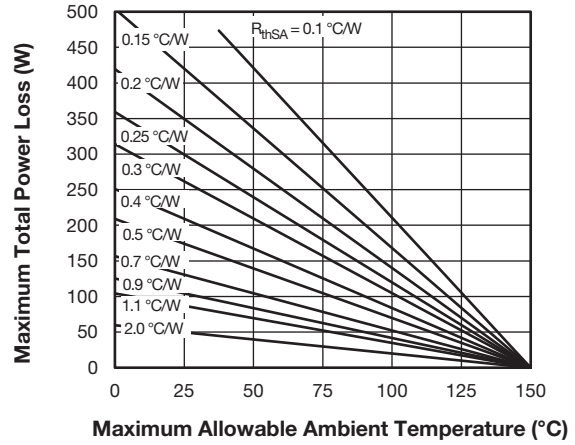
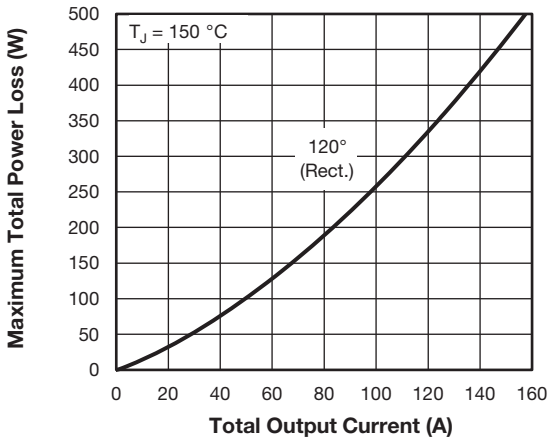


Fig. 3 - Total Power Loss Characteristics

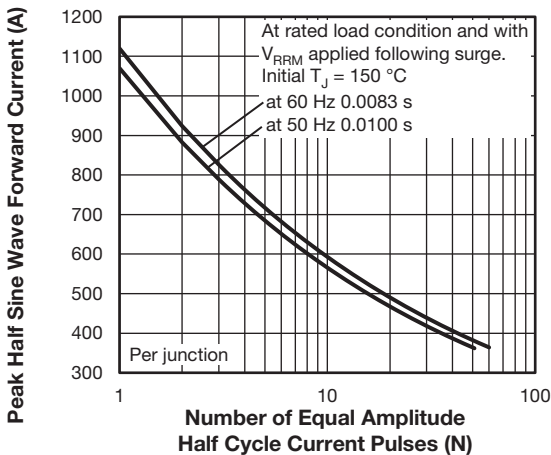


Fig. 4 - Maximum Non-Repetitive Surge Current

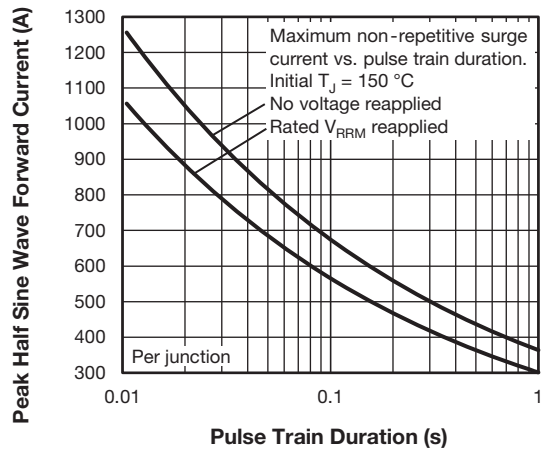


Fig. 5 - Maximum Non-Repetitive Surge Current

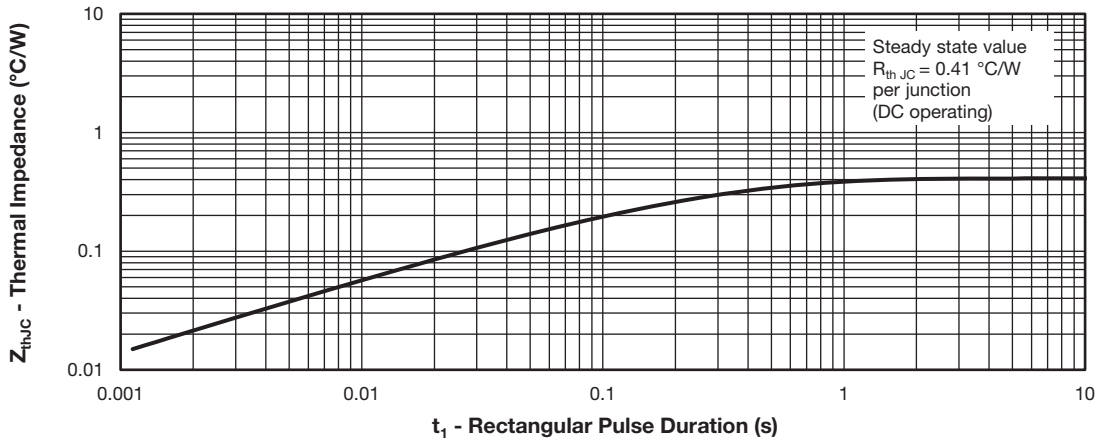


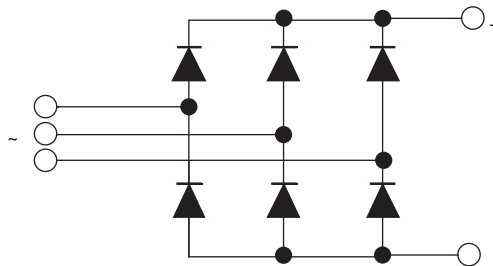
Fig. 6 - Thermal Impedance  $Z_{thJC}$  Characteristic

**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>13</b>	<b>0</b>	<b>MT</b>	<b>160</b>	<b>C</b>
	①	②	③	④	⑤	
	1	2	3	4	5	

- 1** - Vishay Semiconductors product
- 2** - Current rating code: 13 = 130 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**

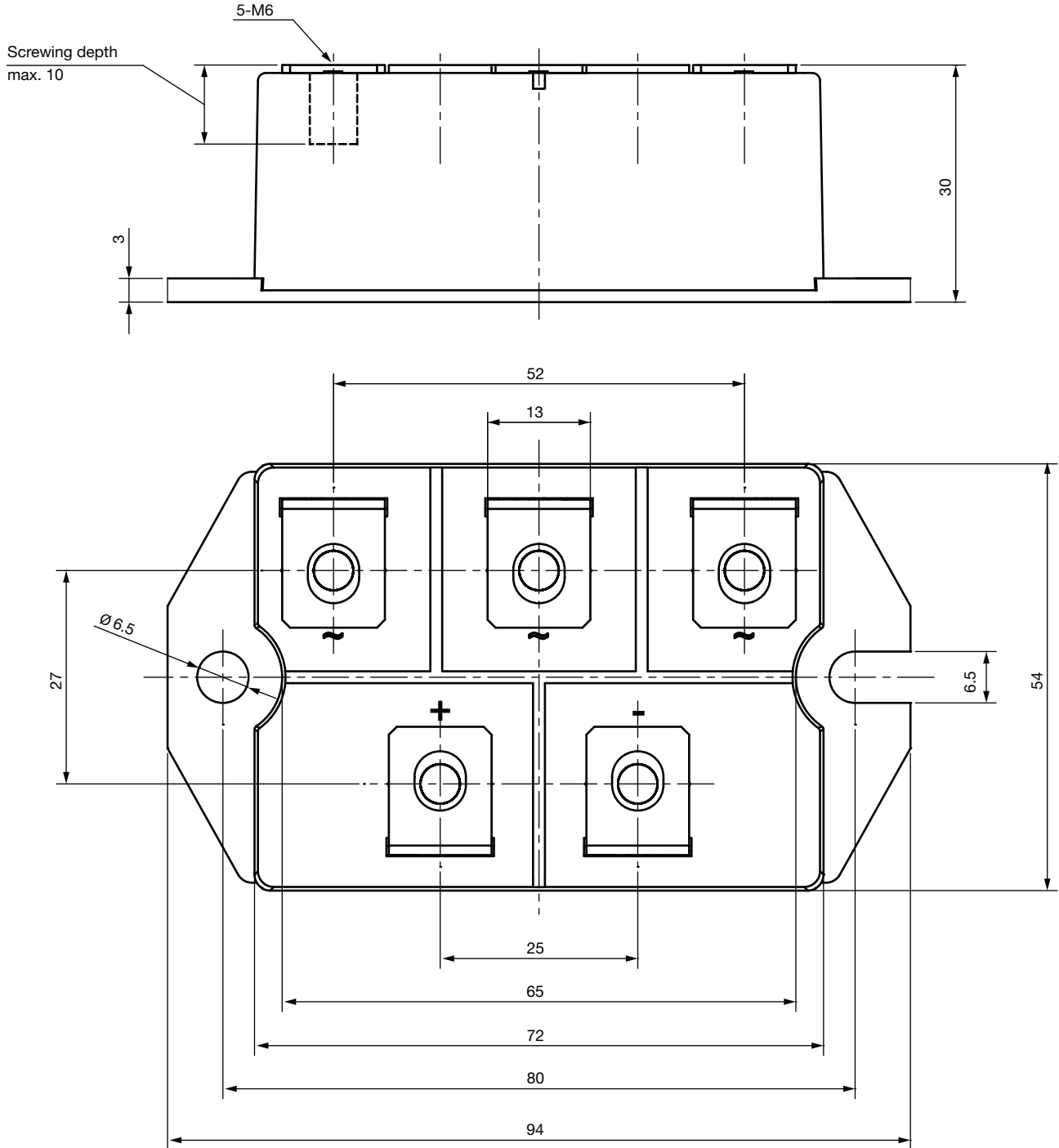


LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?96003">www.vishay.com/doc?96003</a>



## MTC

**DIMENSIONS** in millimeters





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