

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_{RMS} isolating voltage
- UL approved file E78996 
- Designed for industrial level
- Material categorization: for definitions of compliance please see 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 ² s
	60 Hz	10 825	
$I^2\sqrt{t}$		118 580	A ² √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-161MT...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			160	A
					118	°C
Maximum peak, one-cycle forward, non-repetitive surge current	I _{FSM}	t = 10 ms	No voltage reapplied	Initial T _J = T _J maximum	1540	A
		t = 8.3 ms			1610	
		t = 10 ms	100 % V _{RRM} reapplied		1295	
		t = 8.3 ms			1355	
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		11 860	A ² s
		t = 8.3 ms			10 825	
		t = 10 ms	100 % V _{RRM} reapplied		8385	
		t = 8.3 ms			7620	
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied			118 580	A ² √s
Low level value of threshold voltage	V _{FT(TO)1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J maximum			0.81	V
High level value of threshold voltage	V _{FT(TO)2}	(I > π × I _{F(AV)}), T _J maximum			0.98	
Low level value of forward slope resistance	r _{f1}	16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)} , T _J maximum			3.89	mΩ
High level of forward slope resistance	r _{f2}	(I > π × I _{F(AV)}), T _J maximum			3.68	
Maximum forward voltage drop	V _{FM}	I _{pk} = 300 A, T _J = 25 °C, per junction			1.85	V
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	0.058	°C/W
		DC operation per junction	0.35	
Typical thermal resistance, case to heatsink	R_{thCS}	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-161MT...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

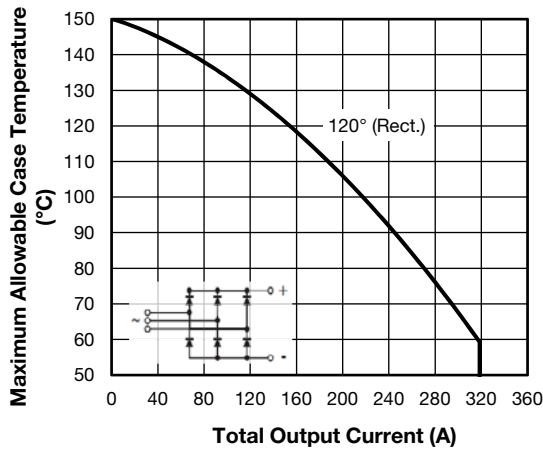


Fig. 1 - Current Ratings Characteristics

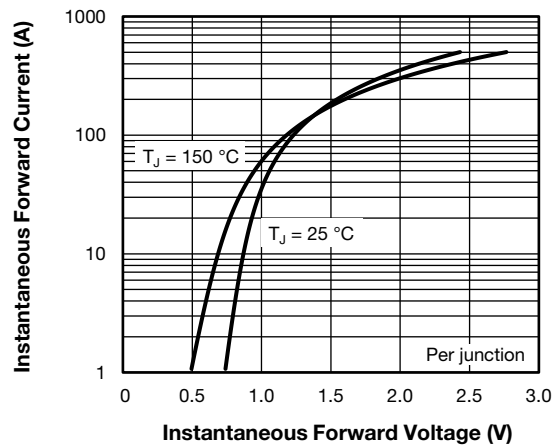


Fig. 2 - Forward Voltage Drop Characteristics

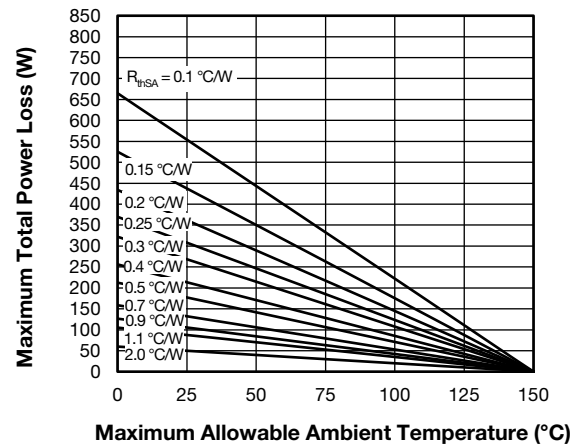
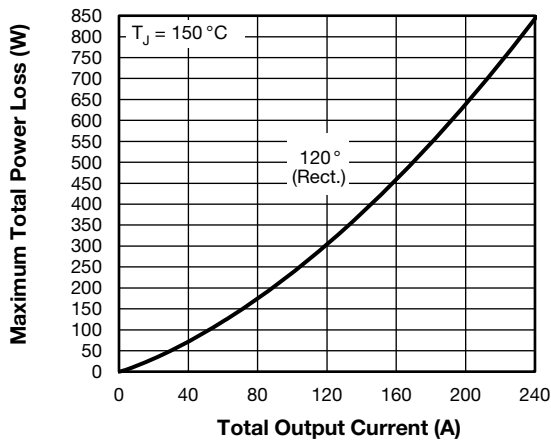


Fig. 3 - Total Power Loss Characteristics

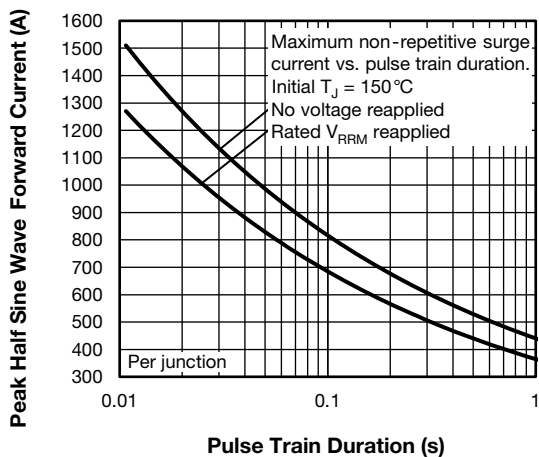


Fig. 4 - Maximum Non-Repetitive Surge Current

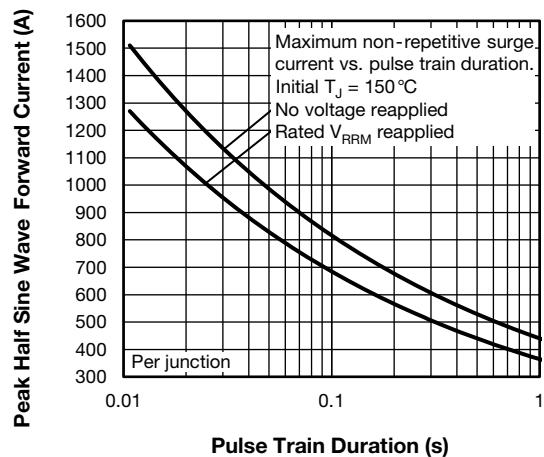


Fig. 5 - Maximum Non-Repetitive Surge Current

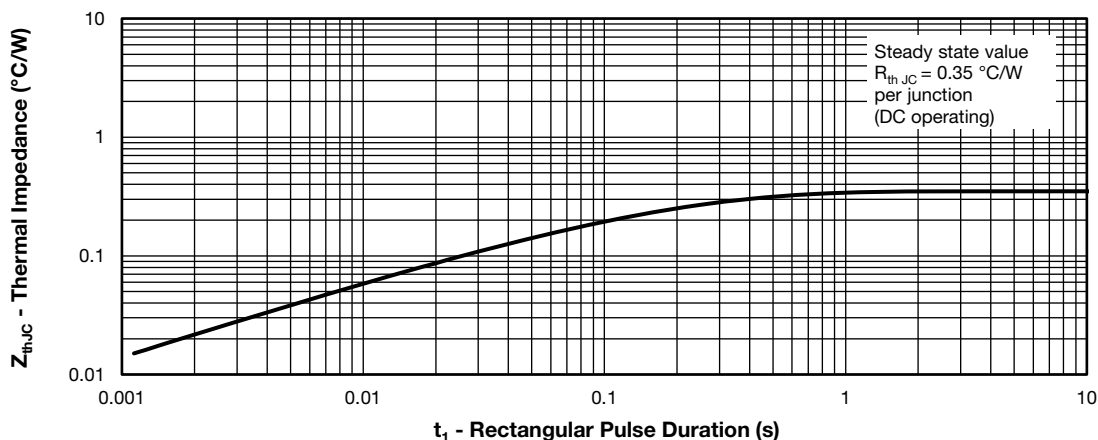
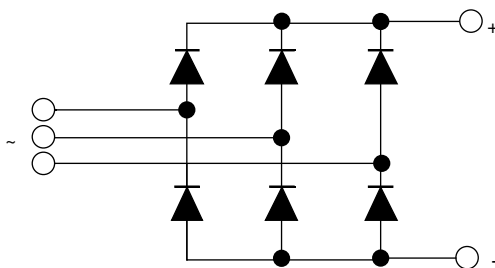


Fig. 6 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

Device code	VS-	16	1	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

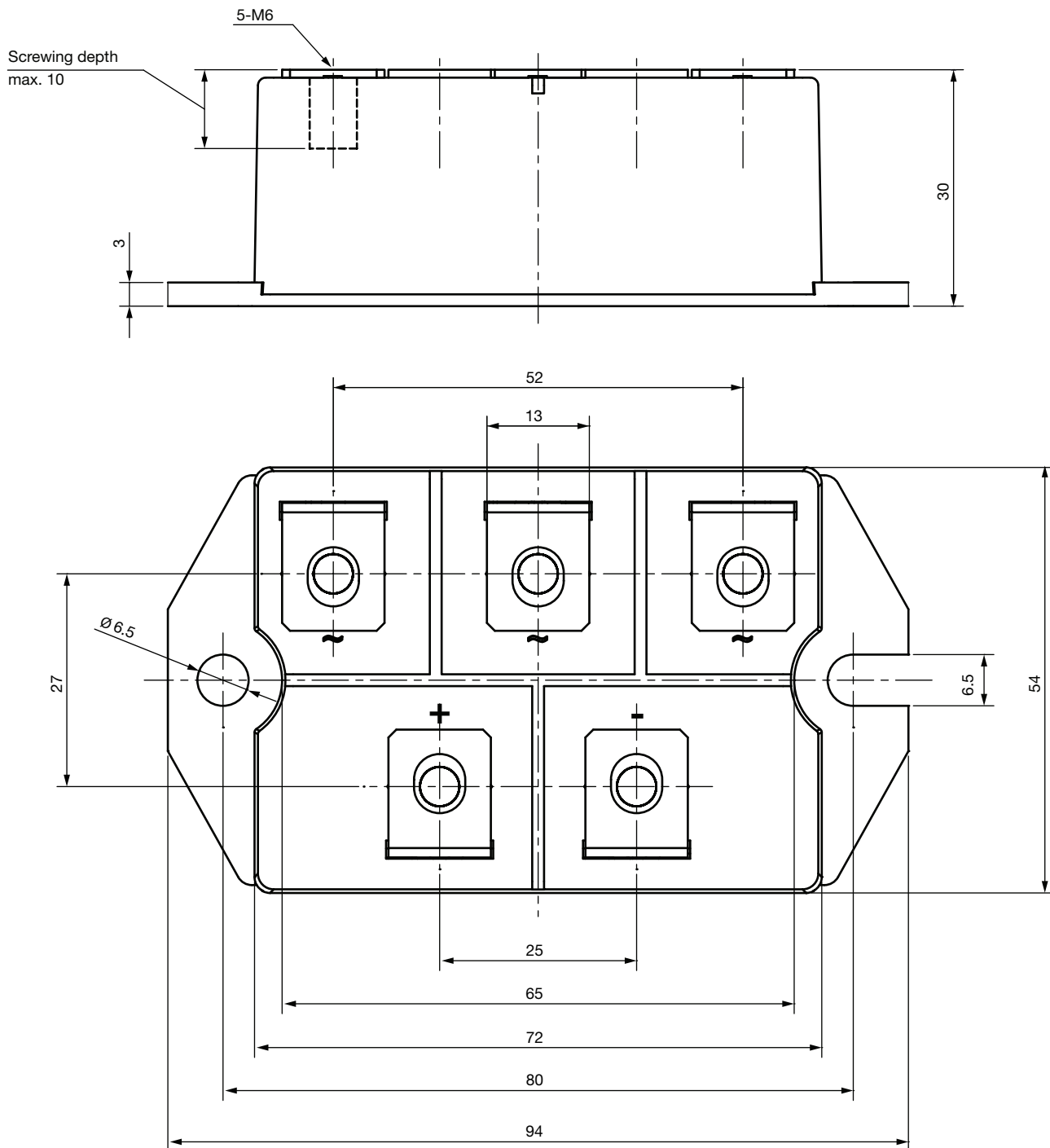
Dimensions

www.vishay.com/doc?96003



MTC

DIMENSIONS in millimeters





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