

Three Phase Bridge, 160 A (Power Modules)



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 ² t	50 Hz	11 860	A ² s
	60 Hz	10 825	
I ² √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	100 % V _{RRM} reapplied		1610			
		t = 10 ms			1295			
		t = 8.3 ms	100 % V _{RRM} reapplied		1355			
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied	Initial T _J = T _J maximum	11 860	A ² s		
		t = 8.3 ms	100 % V _{RRM} reapplied		10 825			
		t = 10 ms			8385			
		t = 8.3 ms	100 % V _{RRM} reapplied		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 % x π x I _{F(AV)} < I < π x I _{F(AV)}), T _J maximum				0.81	V	
High level value of threshold voltage	V _{FT(TO)2}	(I > π x I _{F(AV)}), T _J maximum				0.98		
Low level value of forward slope resistance	r _{f1}	16.7 % x π x I _{F(AV)} < I < π x I _{F(AV)} , T _J maximum				3.89	mΩ	
High level of forward slope resistance	r _{f2}	(I > π x 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	(I < I _{F(AV)}), T _J maximum				-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	°C/W
Mounting torque ± 15 %	to heatsink to terminal		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.				Nm
			235				
Approximate weight							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

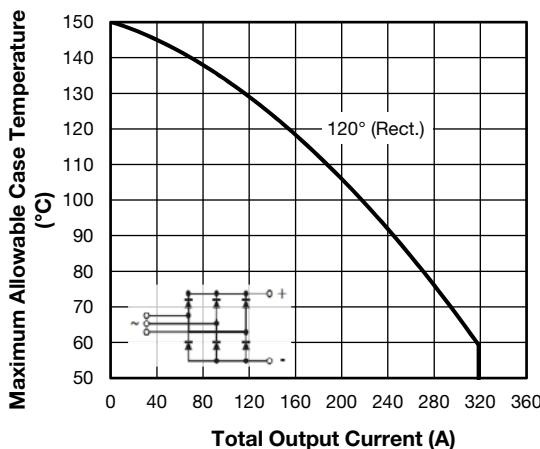


Fig. 1 - Current Ratings Characteristics

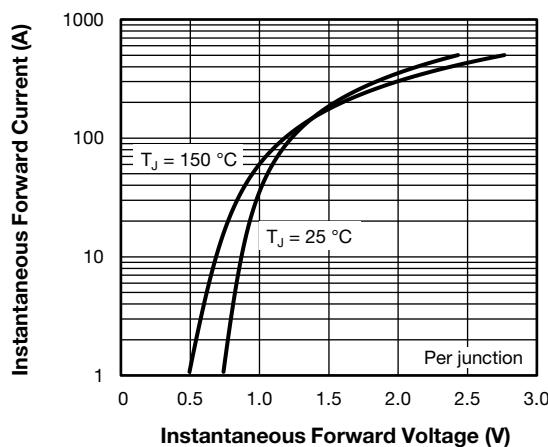


Fig. 2 - Forward Voltage Drop Characteristics

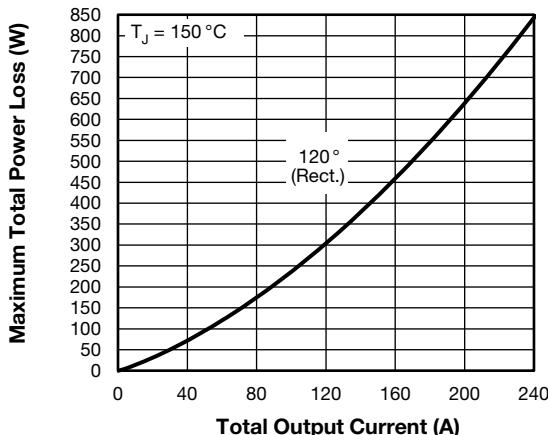


Fig. 3 - Total Power Loss Characteristics

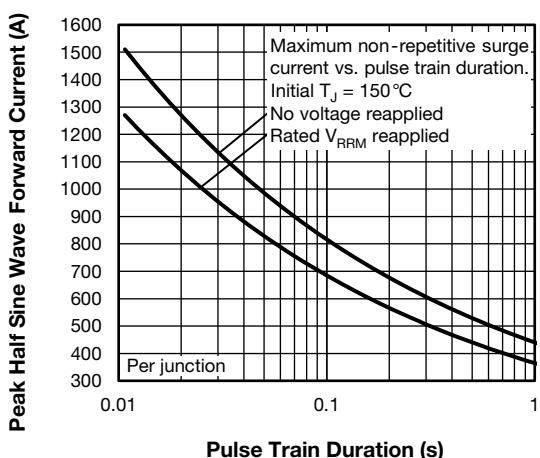
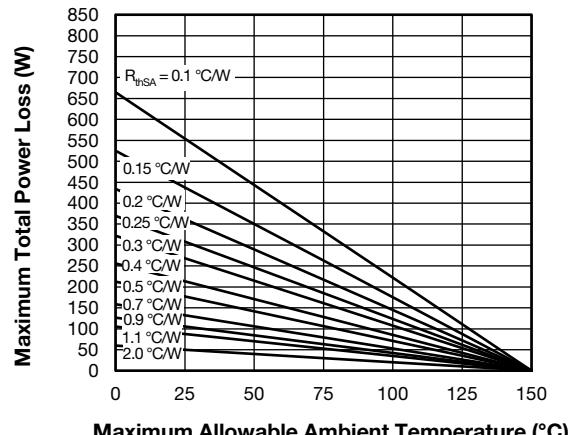


Fig. 4 - Maximum Non-Repetitive Surge Current

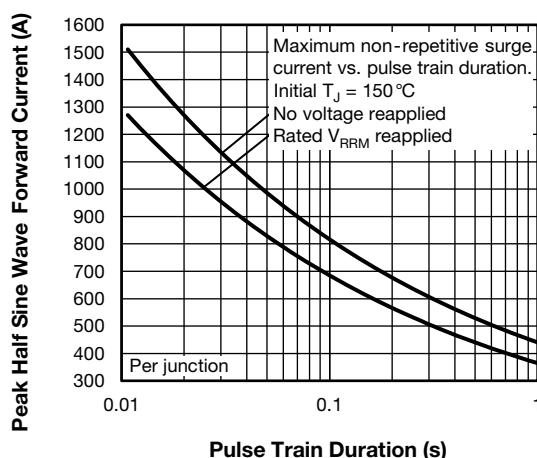


Fig. 5 - Maximum Non-Repetitive Surge Current

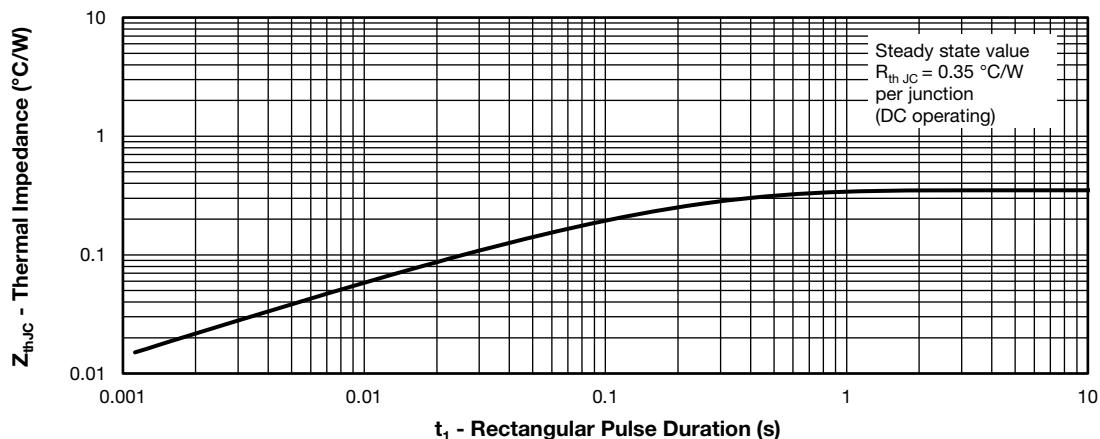
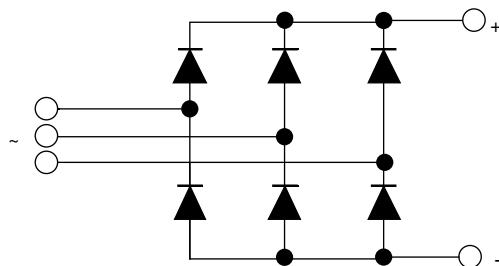


Fig. 6 - Thermal Impedance $Z_{th,JC}$ Characteristic

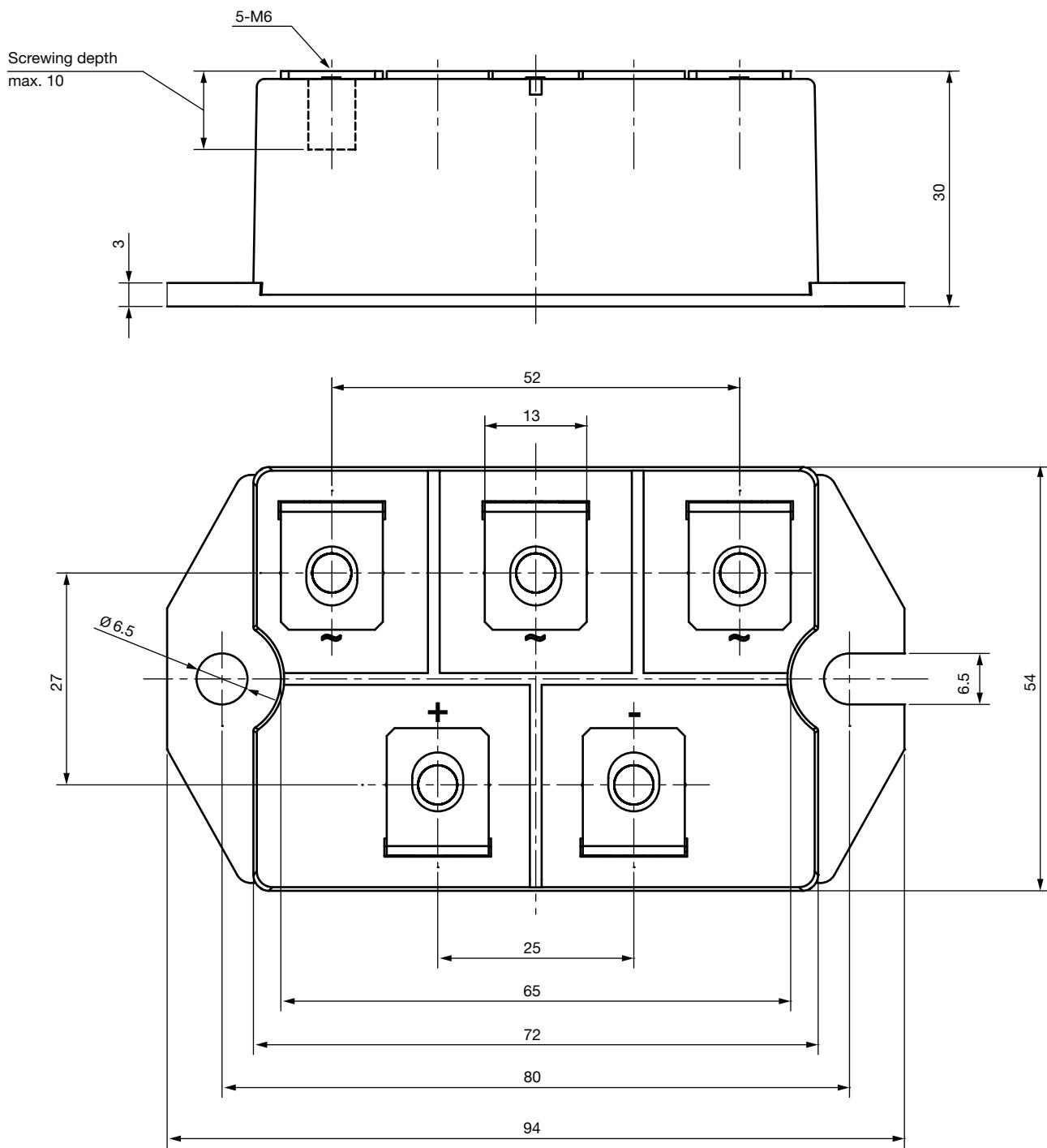
ORDERING INFORMATION TABLE

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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