

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_{RMS} isolating voltage
- UL pending
- 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.

PRODUCT SUMMARY

I_O	130 A at 120 °C
V_{RRM}	1600 V to 1800 V
Package	MTC
Circuit	Three phase bridge

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 ² s
	60 Hz	7390	
$I^2\sqrt{t}$		80 955	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-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 _O	120° rect. conduction angle			130	A	
					120	°C	
Maximum peak, one-cycle forward, non-repetitive surge current	I _{FSM}	t = 10 ms	No voltage reappplied	Initial T _J = T _J maximum	1270	A	
		t = 8.3 ms			1330		
		t = 10 ms	100 % V _{RRM} reappplied		1070		
		t = 8.3 ms			1120		
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reappplied		8095	A ² s	
		t = 8.3 ms			7390		
		t = 10 ms	100 % V _{RRM} reappplied		5725		
		t = 8.3 ms			5225		
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reappplied			80 955	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			0.79	V	
High level value of threshold voltage	V _{FT(TO)2}	(I > π × I _{F(AV)}), T _J maximum			0.96		
Low level value of forward slope resistance	r _{f1}	16.7 % × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J maximum			4.97	mΩ	
High level of forward slope resistance	r _{f2}	(I > π × I _{F(AV)}), T _J maximum			4.63		
Maximum forward voltage drop	V _{FM}	I _{pk} = 300 A, T _J = 25 °C, per junction			2.05	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	0.068	°C/W
			DC operation per junction	0.41	
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.	5	Nm
	to terminal			5	
Approximate weight			Lubricated threads.	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-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_{thJC} when devices operate at different conduction angles than DC

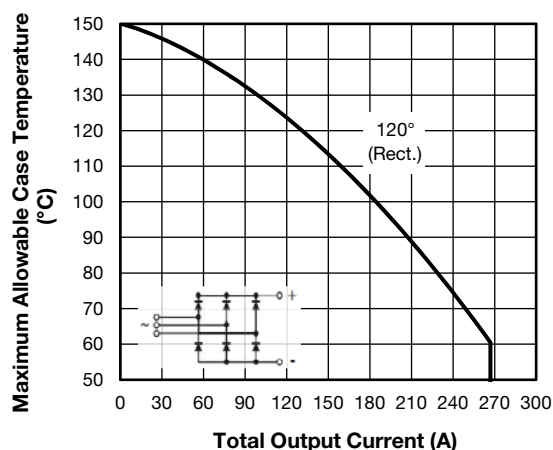


Fig. 1 - Current Ratings Characteristics

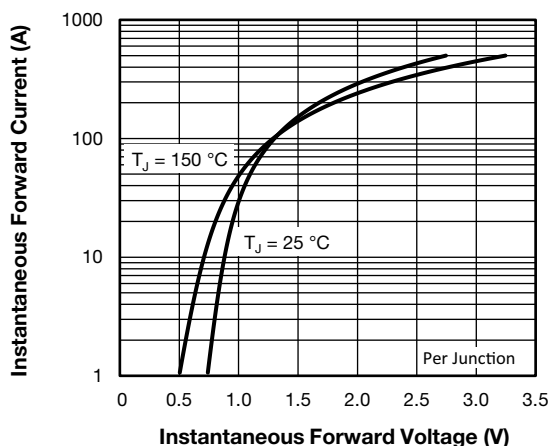


Fig. 2 - Forward Voltage Drop Characteristics

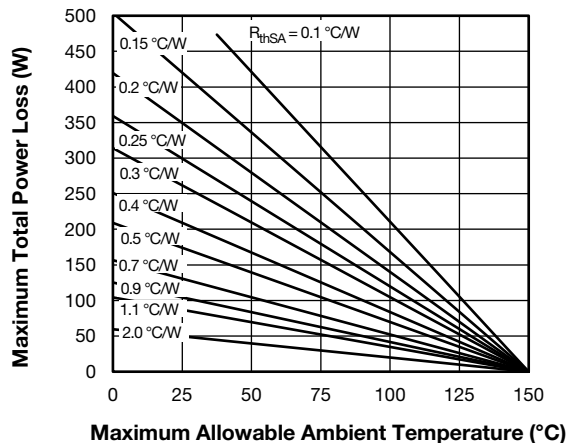
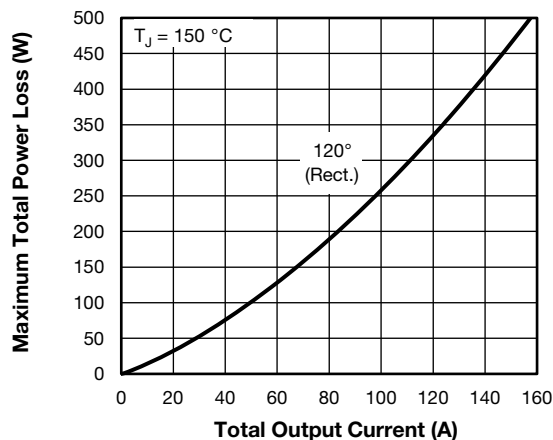


Fig. 3 - Total Power Loss Characteristics

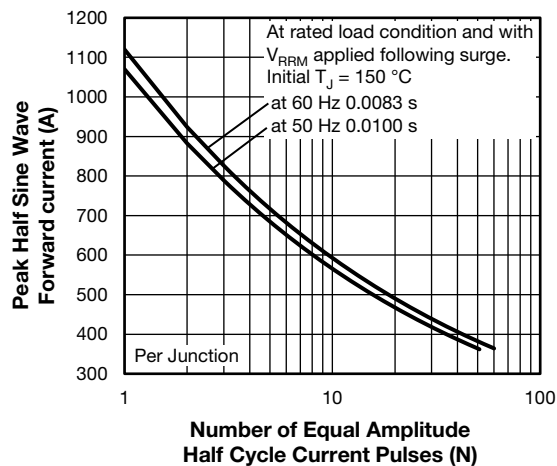


Fig. 4 - Maximum Non-Repetitive Surge Current

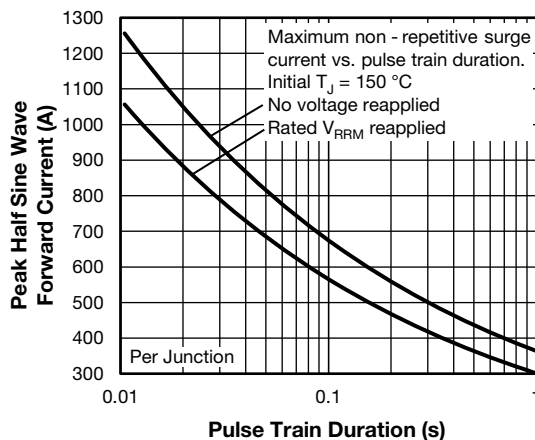
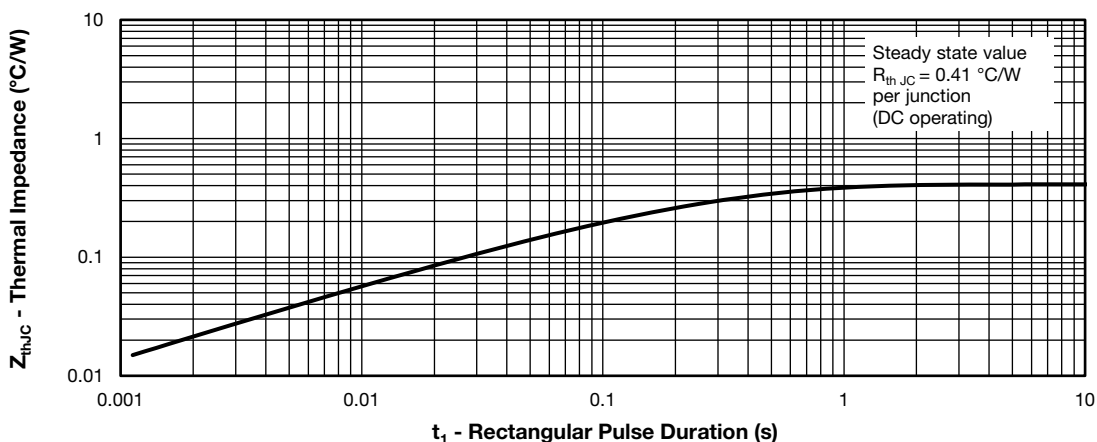


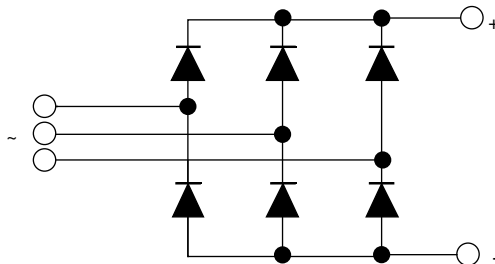
Fig. 5 - Maximum Non-Repetitive Surge Current


Fig. 6 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

Device code	VS-	13	0	MT	160	C
	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

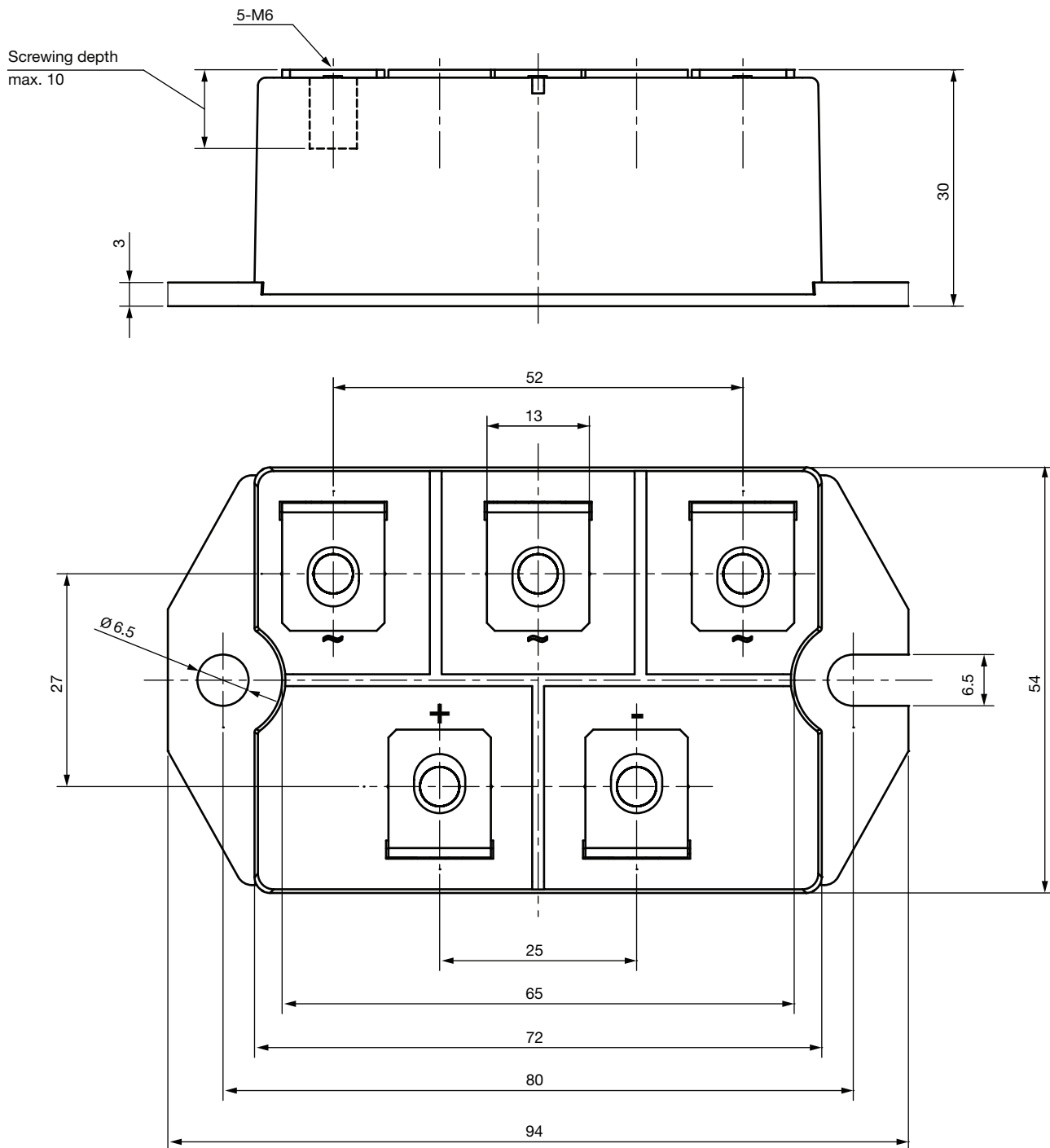


LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96003



MTC

DIMENSIONS in millimeters





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