

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_{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

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
$I_O^{(1)}$		258	A
	T_C	110	°C
I_{FSM}	50 Hz	2400	A
	60 Hz	2512	
I^2t	50 Hz	28 795	A ² s
	60 Hz	26 285	
$I^2\sqrt{t}$		287 955	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 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 = MAXIMUM mA
VS-301MT...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	Initial T _J = T _J maximum	2400	A
		t = 8.3 ms			2512	
		t = 10 ms	100 % V _{RRM} reapplied		2018	
		t = 8.3 ms			2113	
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		28 795	A ² 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 √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied			287 955	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			3.36	mΩ
High level of forward slope resistance	r _{f2}	(I > π × 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-301MT...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

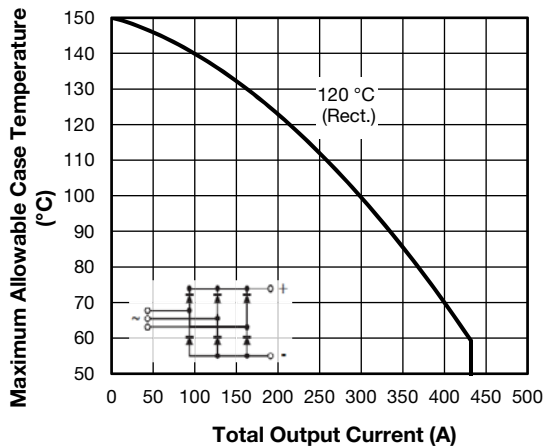


Fig. 1 - Current Rating Characteristics

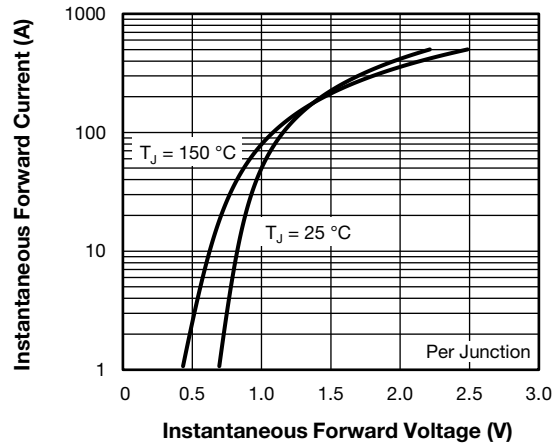


Fig. 2 - Forward Voltage Drop Characteristics

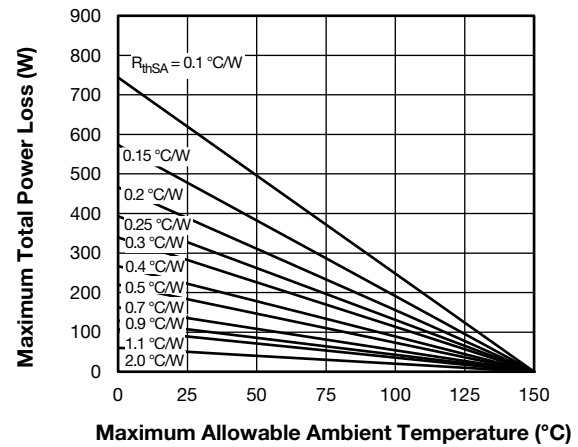
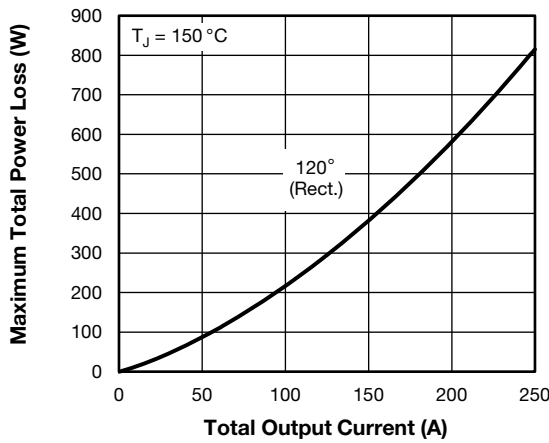


Fig. 3 - Total Power Loss Characteristics

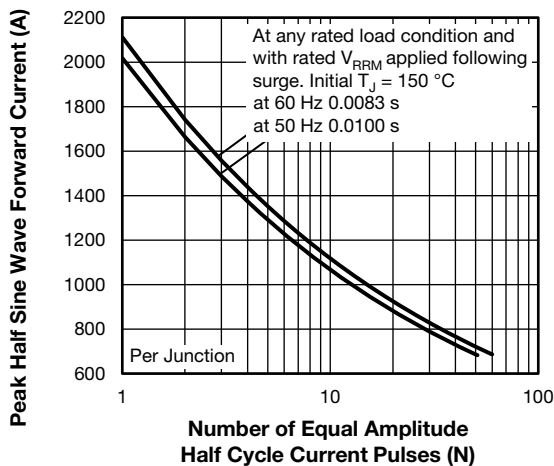


Fig. 4 - Maximum Non-Repetitive Surge Current

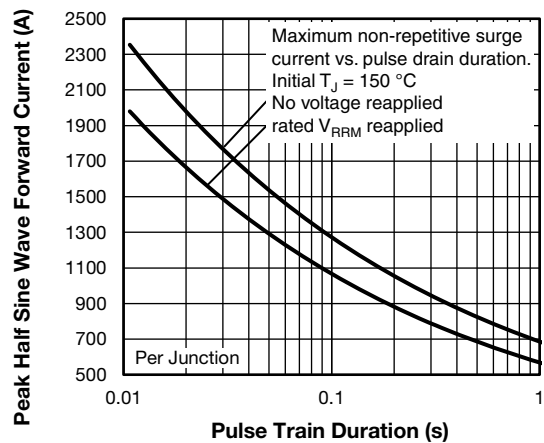
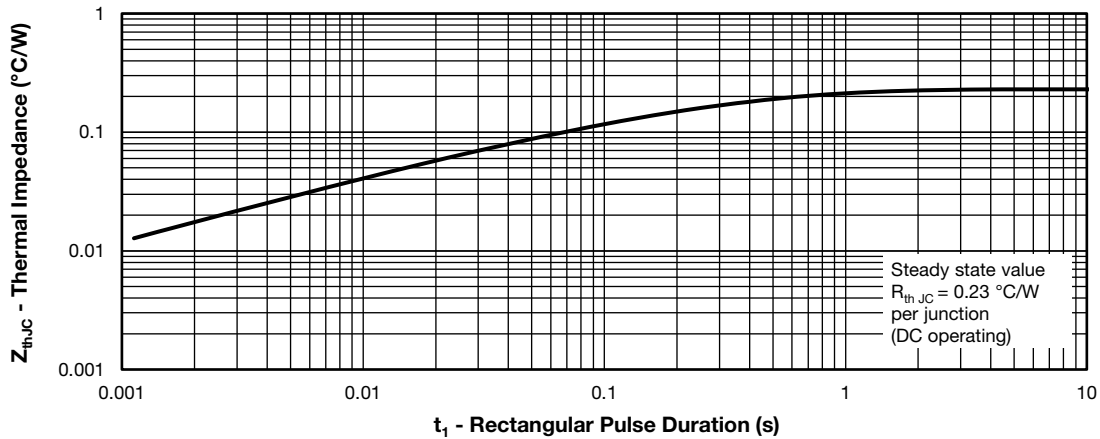


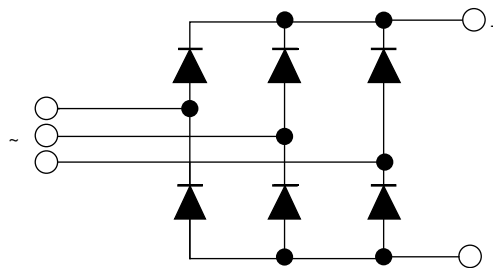
Fig. 5 - Maximum Non-Repetitive Surge Current


Fig. 6 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	30	1	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

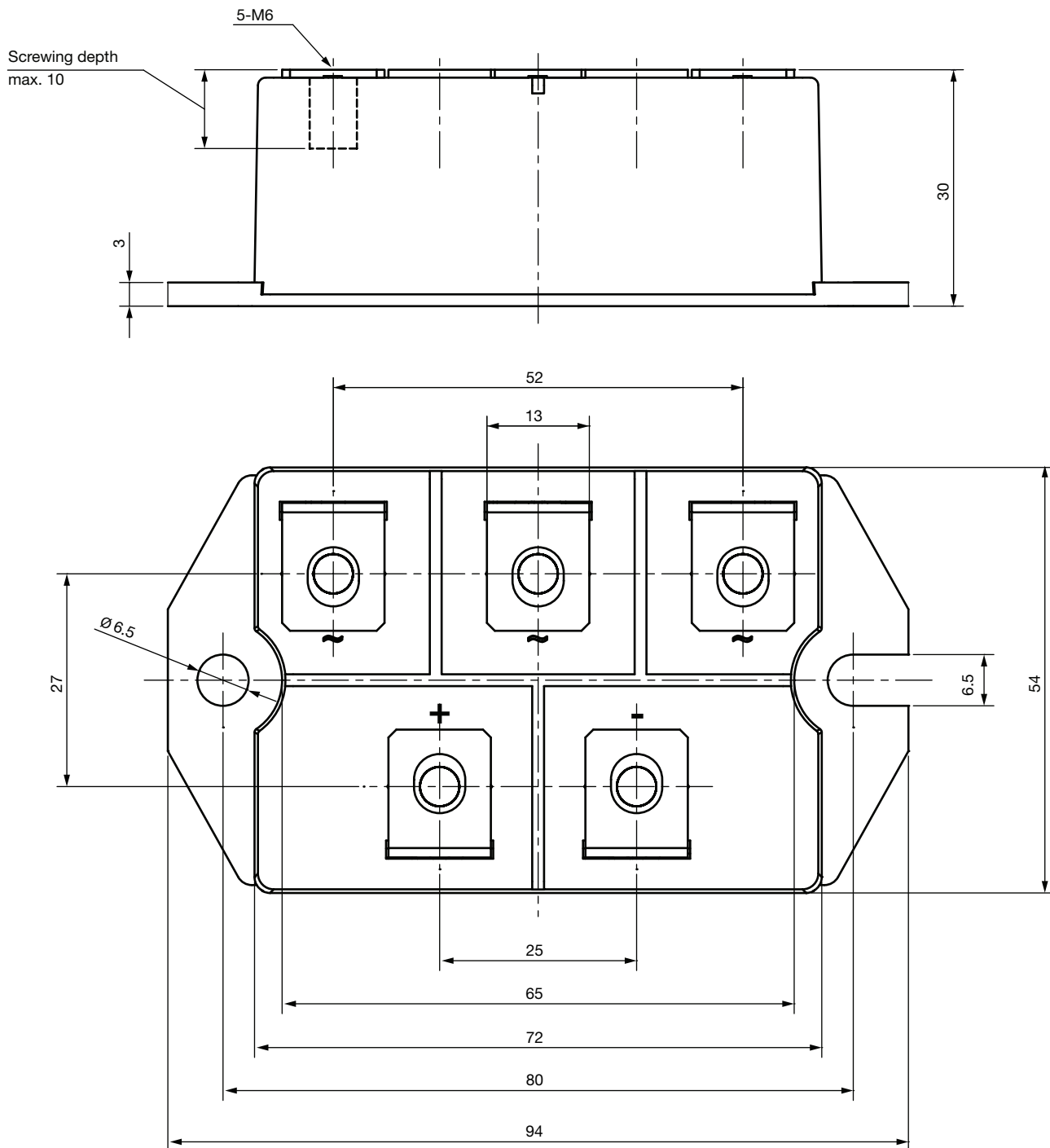
Dimensions

www.vishay.com/doc?96003



MTC

DIMENSIONS in millimeters





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