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^2s
	60 Hz	10 825	
$I^2\sqrt{t}$		118 580	$A^2\sqrt{s}$
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-160MT...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^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		11 860	A^2s
		t = 8.3 ms			10 825	
		t = 10 ms	100 % V_{RRM} reapplied		8385	
		t = 8.3 ms			7620	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			118 580	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{FT(TO)1}$	$(16.7\ \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, T_J maximum			0.81	V
High level value of threshold voltage	$V_{FT(TO)2}$	$(I > \pi \times I_{F(AV)})$, T_J maximum			0.98	
Low level value of forward slope resistance	r_{f1}	$16.7\ \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$, T_J maximum			3.89	mΩ
High level of forward slope resistance	r_{f2}	$(I > \pi \times I_{F(AV)})$, 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-160MT...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

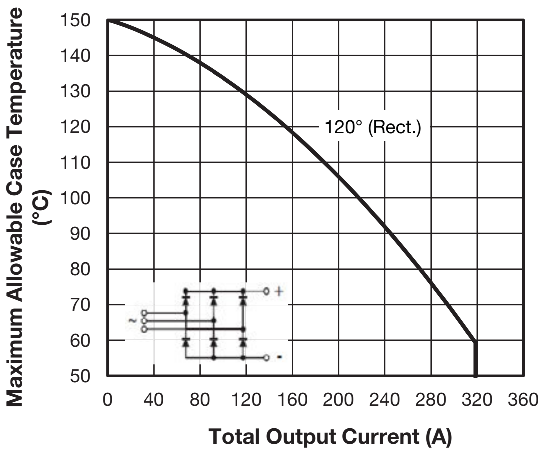


Fig. 1 - Current Ratings Characteristics

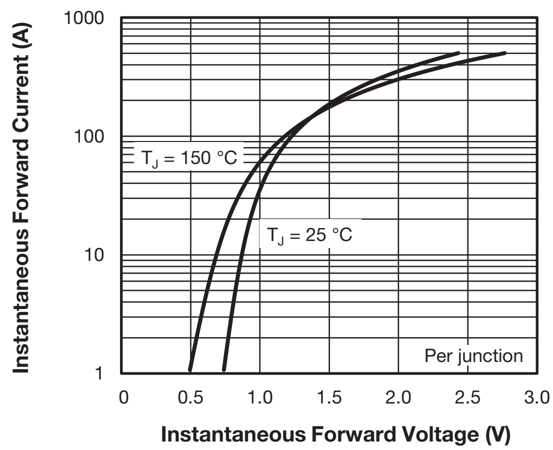


Fig. 2 - Forward Voltage Drop Characteristics

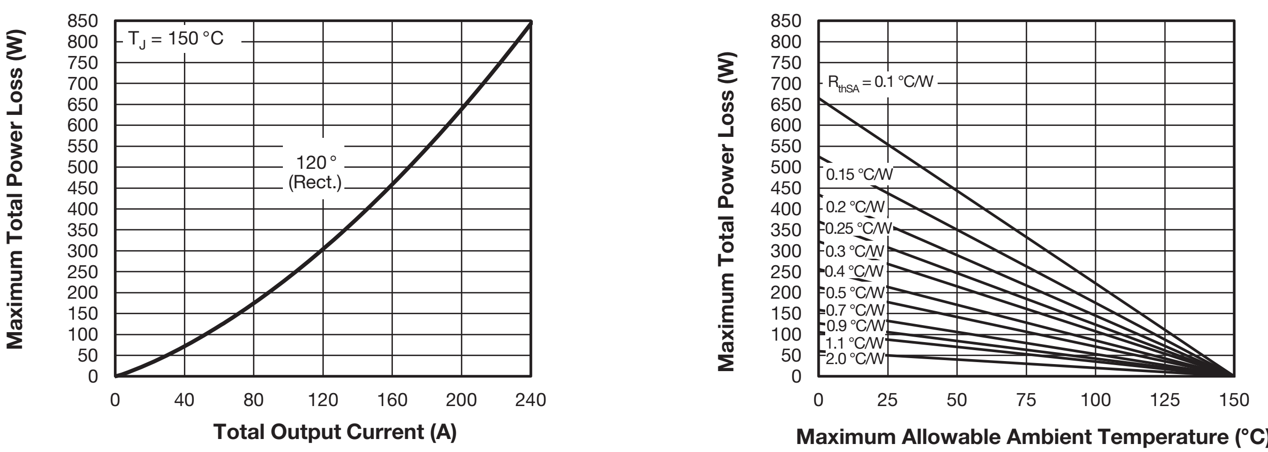


Fig. 3 - Total Power Loss Characteristics

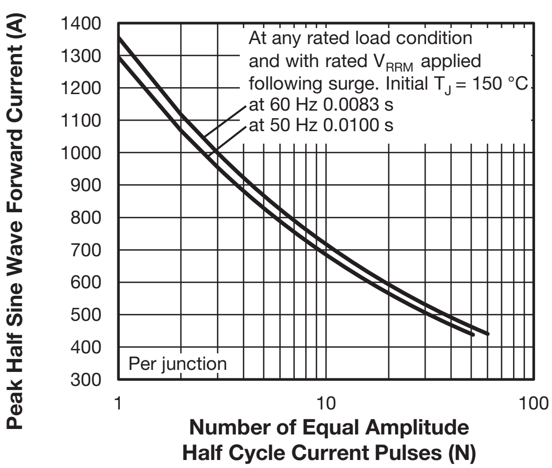


Fig. 4 - Maximum Non-Repetitive Surge Current

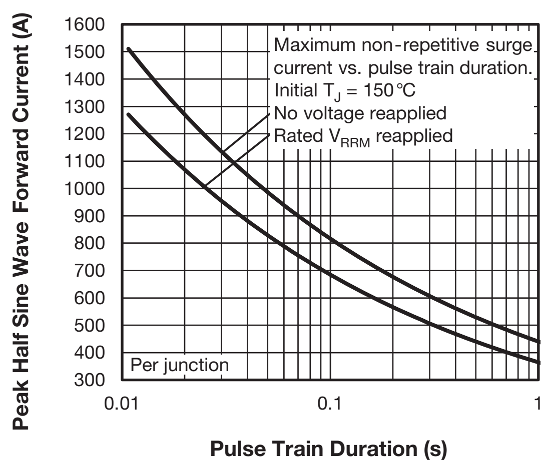


Fig. 5 - Maximum Non-Repetitive Surge Current

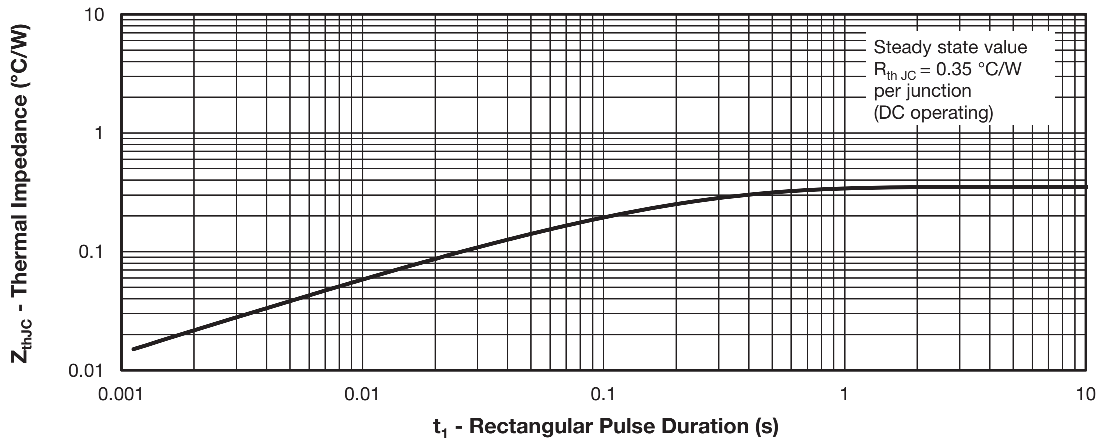


Fig. 6 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

Device code	VS-	16	0	MT	160	C
	1	2	3	4	5	

1 - Vishay Semiconductors product

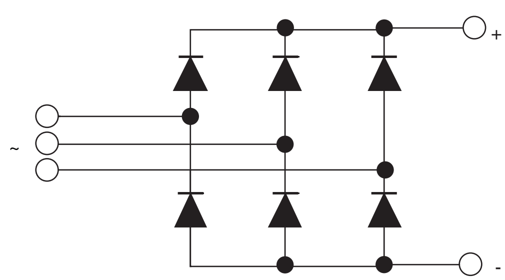
2 - Current rating code: 16 = 160 A (average)

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

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