Insulated Gen 2 Schottky Single Phase Bridge, 150 A

SOT-227

LINKS TO ADDITIONAL RESOURCES

Application Notes

FEATURES

- Max. T_J = 150 °C
- Fully insulated package
- Trench MOS Barrier Schottky technology
- Ultra low forward voltage drop
- Optimized for power conversion: welding and industrial SMPS applications
- Easy to use
- Industry standard outline
- Designed and qualified for industrial level
- UL approved file E78996
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

DESCRIPTION

The VS-QA150BA10 insulated modules integrate single phase bridge state of the art Trench MOS Schottky technology rectifiers in the compact, industry standard SOT-227 package.

These devices are thus intended for high frequency converters and switching power supplies.

PRIMARY CHARACTERISTICS	
I_O at T_C = 98 °C	150 A
V_{RRM}	100 V
V_{FM} at 100 A, T_C = 25 °C	0.87 V
Package	SOT-227
Circuit configuration	Single phase bridge

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I_O	180° rect. conduction angle	150	A
	T_C	98	°C
I_{FSM}	50 Hz	563	A
	60 Hz	590	
I^2t	50 Hz	1588	A^2s
	60 Hz	1450	
V_{RRM}		100	V
E_{AS}	T_J = 25 °C, I_{AS} = 24.3 A, L = 5 mH	1476	mJ
T_J		-40 to +150	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS		
TYPE NUMBER	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V
VS-QA150BA10	100	100

ELECTRICAL SPECIFICATIONS PER DIODE (T_J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V_{BR}	I_R = 2 mA	100	-	-	V
Forward voltage	V_{FM}	I_F = 100 A	-	0.87	1.08	
		I_F = 100 A, T_J = 150 °C	-	0.73	-	
Reverse leakage current	I_{RM}	V_R = 100 V	-	0.1	1.6	mA
		T_J = 125 °C, V_R = 100 V	-	56	-	
Junction capacitance	C_T	V_R = 100 V, f = 1 MHz	-	514	-	pF
RMS isolation voltage	V_{ISOL}	Any terminal to case, t = 1 min	2500	-	-	V

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum DC output current at case temperature	I_O	Resistive or inductive load			150	A
					98	°C
Maximum peak, one-cycle non-repetitive forward current	I_{FSM}	t = 10 ms	No voltage reapplied	Initial T_J = 150 °C	563	A
		t = 8.3 ms			590	
		t = 10 ms	100 % V_{RRM} reapplied		474	
		t = 8.3 ms			496	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		1588	A^2s
		t = 8.3 ms			1450	
		t = 10 ms	100 % V_{RRM} reapplied		1123	
		t = 8.3 ms			1025	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	I^2t for time $t_x = I_2\sqrt{t} \times \sqrt{t_x}$; $0.1 \le t_x \le 10$ ms, V_{RRM} = 0 V			15.8	$kA^2\sqrt{s}$
Low level of threshold voltage, per leg	$V_{F(T0)1}$	(16.7 % x π x $I_{F(AV)}$) < I < π x $I_{F(AV)}$, $T_J = T_J$ maximum			0.59	V
Low level value of forward slope resistance	r_{f1}				4.1	mΩ
High level of threshold voltage, per leg	$V_{F(T0)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.8	V
High level value of forward slope resistance	r_{f2}				3.89	mΩ
Maximum forward voltage, per diode	V_{FM}	I_F = 100 A			1.08	V

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Junction-to-case, per diode	R_{thJC}		-	-	0.58	°C/W
Case-to-heatsink	R_{thCS}	Flat, greased surface	-	0.1	-	
Weight			-	30	-	g
Mounting torque		Torque to terminal	-	-	1.1 (9.7)	Nm (lbf.in)
		Torque to heatsink	-	-	1.8 (15.9)	Nm (lbf.in)
Case style			SOT-227			

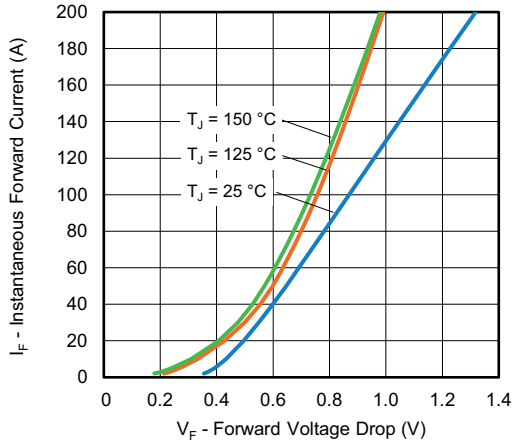


Fig. 1 - Typical Forward Voltage Drop Characteristics

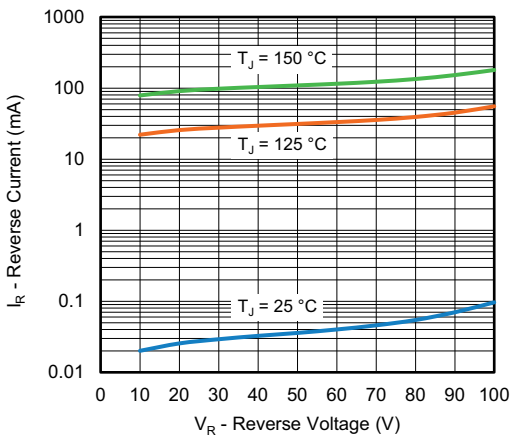


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

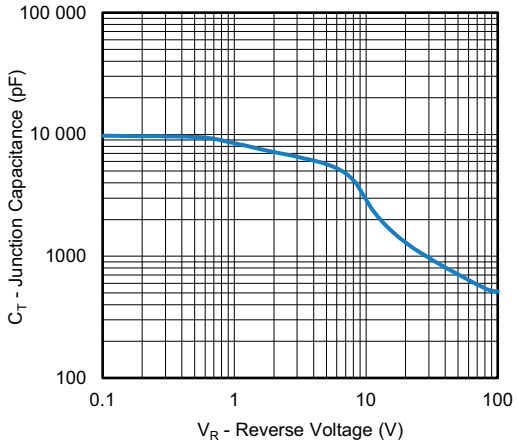


Fig. 3 - Junction Capacitance vs. Reverse Voltage

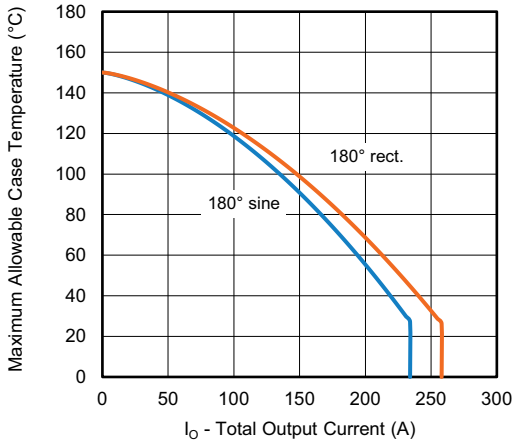


Fig. 4 - Current Rating Characteristics

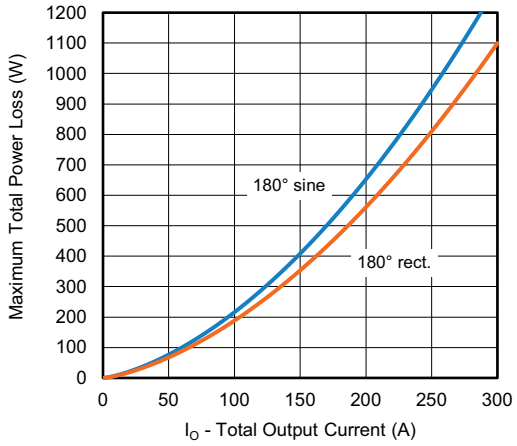


Fig. 5 - Total Power Loss Characteristics

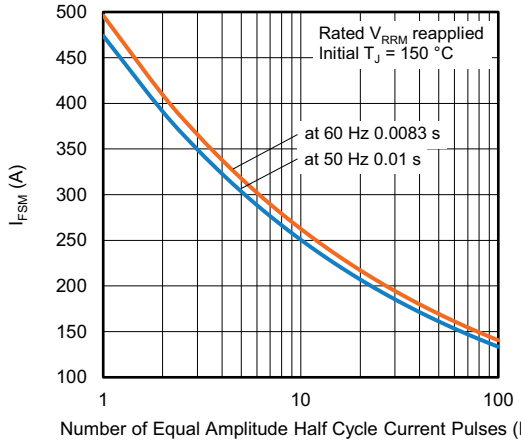


Fig. 6 - Non-Repetitive Peak Forward Surge Current vs. Number Pulses

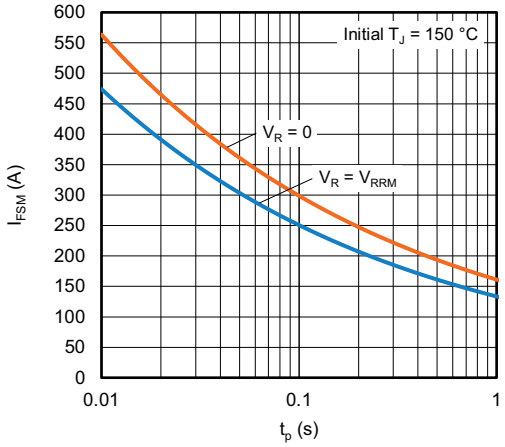


Fig. 7 - Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

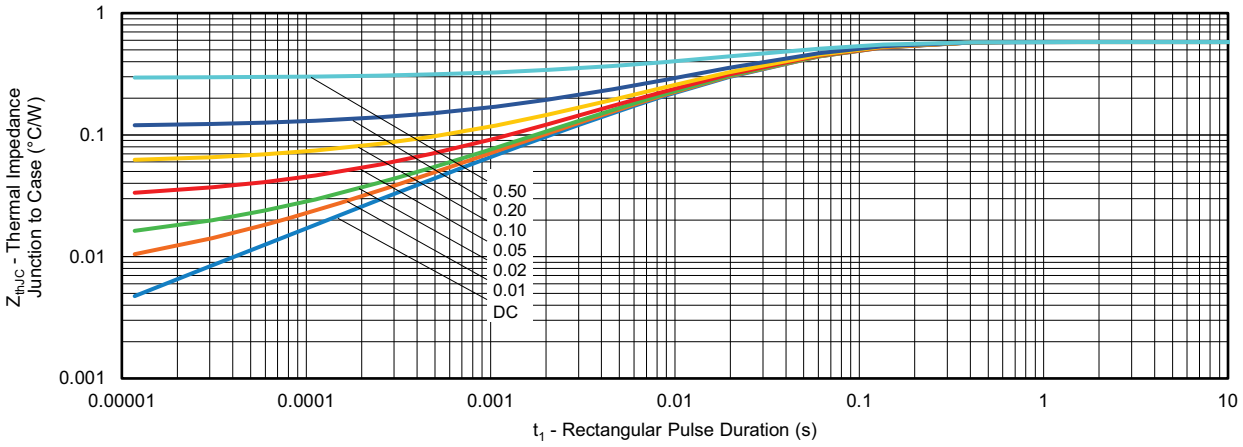


Fig. 8 - Maximum Thermal Impedance Z_{thJC} Characteristics

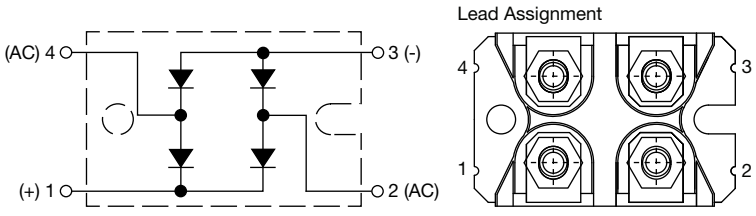
ORDERING INFORMATION TABLE

Device code

VS-	Q	A	150	B	A	10
1	2	3	4	5	6	7

- 1 - Vishay Semiconductors product
- 2 - Schottky technologies
- 3 - Present silicon generation
- 4 - Current rating (150 = 150 A)
- 5 - Circuit configuration (single phase bridge)
- 6 - Package indicator (SOT-227 standard insulated base)
- 7 - Voltage rating (10 = 100 V)

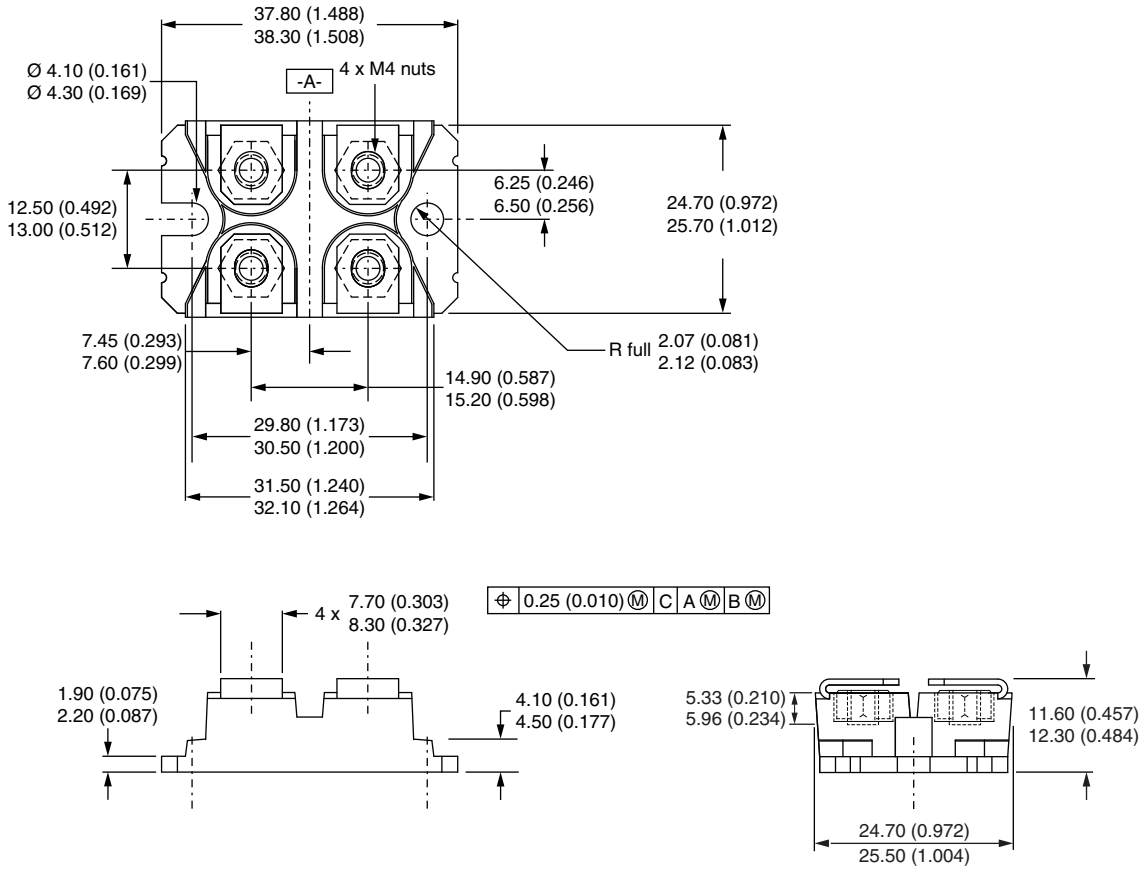
Quantity per tube is 10, M4 screw and washer included

CIRCUIT CONFIGURATION		
CIRCUIT	**CIRCUIT CONFIGURATION CODE**	**CIRCUIT DRAWING**
Single phase bridge	B	

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95423
Part marking information	www.vishay.com/doc?95425

SOT-227 Generation 2

DIMENSIONS in millimeters (inches)



Note

- Controlling dimension: millimeter

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