SOT-227 Power Module
Insulated Standard Recovery Rectifier, 220 A

SOT-227

FEATURES

- Two fully independent diodes
- Fully insulated package
- High voltage rectifiers optimized for very low forward voltage drop
- Industry standard outline
- UL approved file E78996
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

DESCRIPTION / APPLICATIONS

These devices are intended for use in main rectification. Single or three phase bridge.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$ per module	220 A, T_C = 88 °C
V_{FM} typical at 110 A	1.13 V
Type	Modules - diode, high voltage
Package	SOT-227
Circuit configuration	Two separate diodes, parallel pin-out

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	90 °C	108	A
$I_{F(RMS)}$		173	
I_{FSM}	50 Hz	1170	
	60 Hz	1225	
I^2t	50 Hz	6840	A^2s
	60 Hz	6225	
$I^2\sqrt{t}$		68 440	$A^2\sqrt{s}$
V_{RRM}		1200	V
T_J		-55 to +150	°C
T_{Stg}		-40 to +150	°C

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} TYPICAL AT 150 °C mA
VS-RA220FA120	120	1200	1300	1.0

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FORWARD CONDUCTION						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**			**VALUES**	**UNITS**
Maximum average forward current at case temperature per leg	$I_{F(AV)}$	180° conduction, half sine wave, 90 °C			108	A
Maximum RMS forward current per leg	$I_{F(RMS)}$	DC at 94 °C case temperature			173	A
Maximum peak, one-cycle forward, non-repetitive surge current per leg	I_{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	1170	
		t = 8.3 ms			1225	
		t = 10 ms	100 % V_{RRM} reapplied		985	
		t = 8.3 ms			1030	
Maximum I^2t for fusing per leg	I^2t	t = 10 ms	No voltage reapplied		6840	A^2s
		t = 8.3 ms			6225	
		t = 10 ms	100 % V_{RRM} reapplied		4840	
		t = 8.3 ms			4400	
Maximum $I^2\sqrt{t}$ for fusing per leg	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			68 440	$A^2\sqrt{s}$
Low level of threshold voltage per leg	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.75	V
Low level value of forward slope resistance	r_{f1}				4.93	mΩ
High level of threshold voltage per leg	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.84	V
High level value of forward slope resistance	r_{f2}				4.85	mΩ
Maximum forward voltage drop per leg	V_{FM}	I_{FM} = 110 A, T_J = 25 °C			1.31	V
		I_{FM} = 110 A, T_J = 150 °C			1.24	

BLOCKING				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**VALUES**	**UNITS**
Maximum peak reverse leakage current per leg	I_{RRM}	T_J = 25 °C	150	µA
		T_J = 150 °C	1.5	mA
RMS insulation voltage	V_{INS}	T_J = 25 °C, any terminal to case, t = 1 minute	2500	V

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER		**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Thermal resistance, junction to case	per leg	R_{thJC}	-	-	0.2	°C/W
	per module		-	-	0.1	
Thermal resistance, case to heatsink	per module	R_{thCS}	-	0.1	-	
Weight			-	30	-	g
Mounting torque to terminal			-	-	1.1 (9.7)	Nm (lbf. in)
Mounting torque to heatsink			-	-	1.8 (15.9)	Nm (lbf. in)
Case style			SOT-227			

ΔR CONDUCTION PER JUNCTION											
DEVICE	**SINE HALF WAVE CONDUCTION**					**RECTANGULAR WAVE CONDUCTION**					**UNITS**
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
VS-RA220FA120	0.06	0.037	0.082	0.116	0.188	0.039	0.066	0.087	0.121	0.19	°C/W

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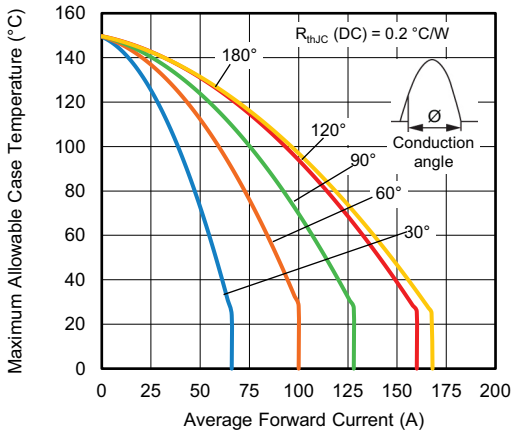

Fig. 1 - Current Ratings Characteristics (A)

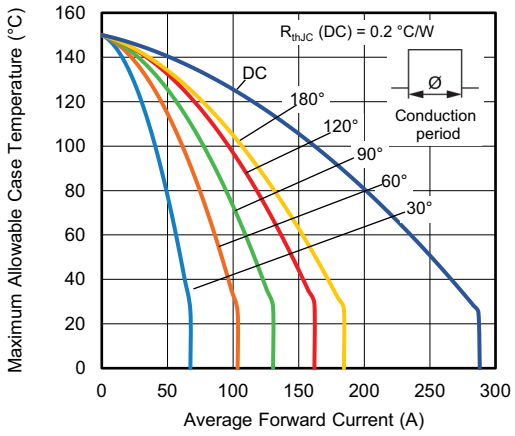

Fig. 2 - Current Ratings Characteristics (A)

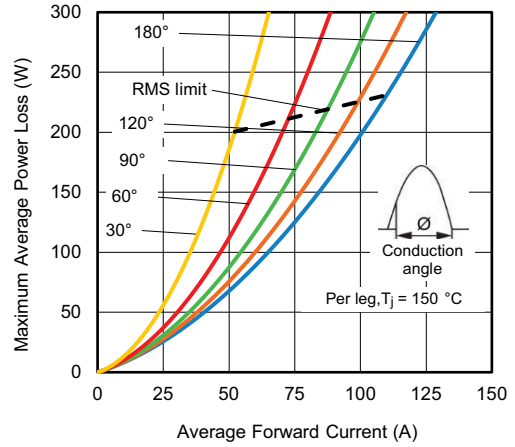

Fig. 3 - Forward Power Loss Characteristics

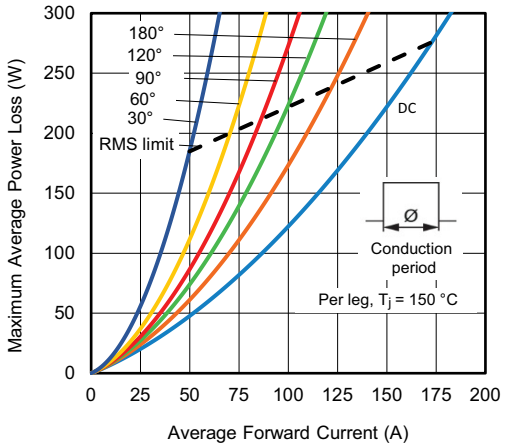

Fig. 4 - Forward Power Loss Characteristics

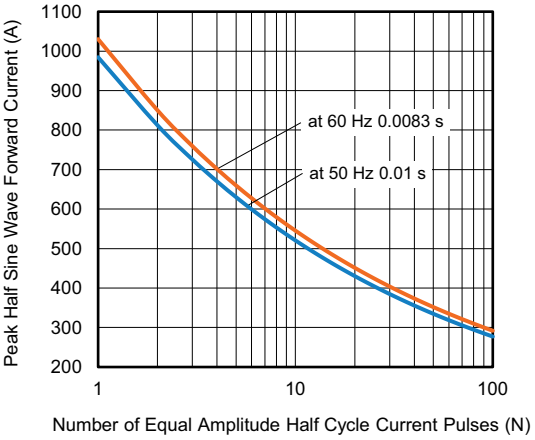

Fig. 5 - Maximum Non-Repetitive Surge Current

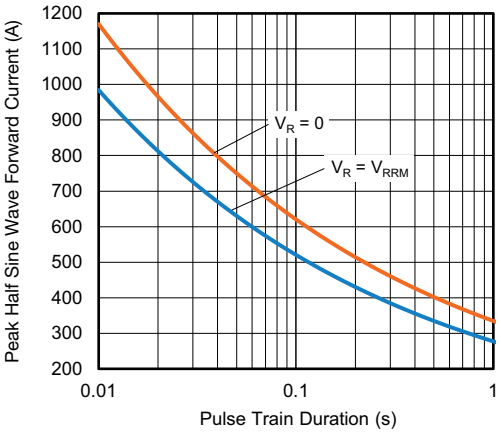

Fig. 6 - Maximum Non-Repetitive Surge Current

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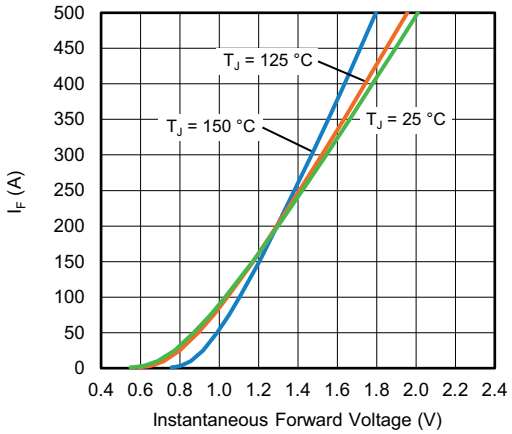

Fig. 7 - Typical Forward Voltage Characteristics

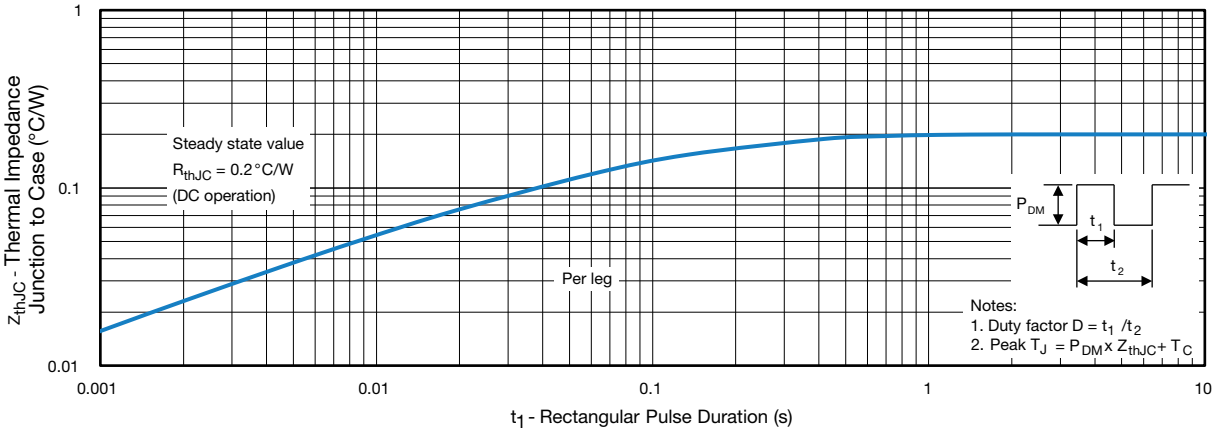

Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

VS-	R	A	220	F	A	120
1	2	3	4	5	6	7

- 1 - Vishay Semiconductors product
- 2 - Standard recovery diode
- 3 - Present silicon generation
- 4 - Current rating (220 = 220 A)
- 5 - Circuit configuration (2 separate diodes, parallel pin-out)
- 6 - Package indicator (SOT-227 standard insulated base)
- 7 - Voltage rating (120 = 1200 V)

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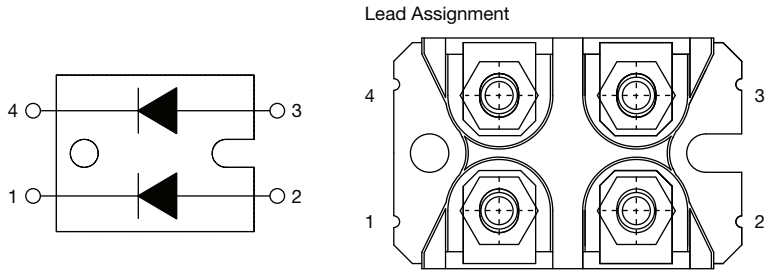
CIRCUIT CONFIGURATION		
CIRCUIT	**CIRCUIT CONFIGURATION CODE**	**CIRCUIT DRAWING**
Two separate diodes, parallel pin-out	F	

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

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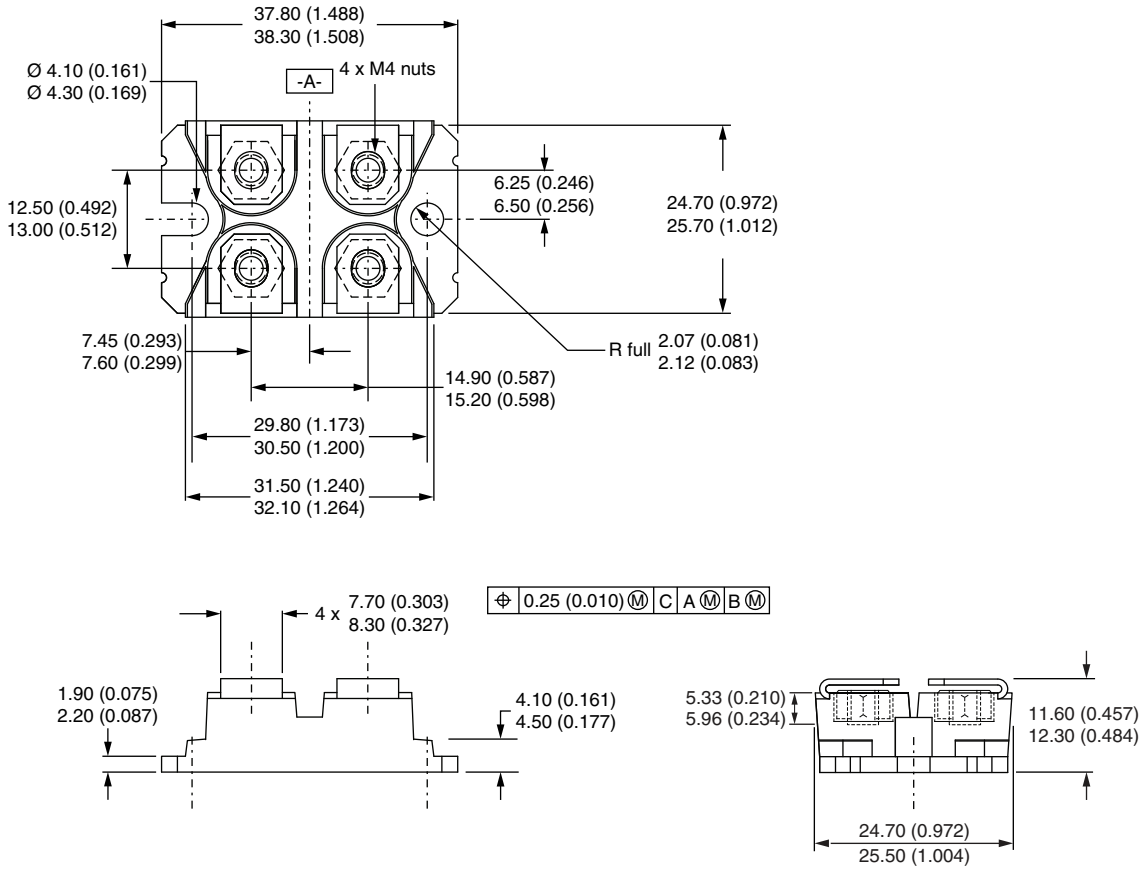
SOT-227 Generation 2

DIMENSIONS in millimeters (inches)



Note

- Controlling dimension: millimeter

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