

## 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](http://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, $T_C = 88^\circ\text{C}$
$V_{FM}$ 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 $^\circ\text{C}$	108	A
$I_{F(RMS)}$		173	
$I_{FSM}$	50 Hz	1170	
	60 Hz	1225	
$I^2t$	50 Hz	6840	$\text{A}^2\text{s}$
	60 Hz	6225	
$I^2\sqrt{t}$		68 440	
$V_{RRM}$		1200	V
$T_J$		-55 to +150	$^\circ\text{C}$

### 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 $^\circ\text{C}$ mA
VS-RA220FA120	120	1200	1300	1.0

**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			
Maximum peak, one-cycle forward, non-repetitive surge current per leg	$I_{FSM}$	$t = 10 \text{ ms}$	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum		1170	A		
		$t = 8.3 \text{ ms}$	100 % $V_{RRM}$ reapplied			1225			
		$t = 10 \text{ ms}$	No voltage reapplied			985			
		$t = 8.3 \text{ ms}$	100 % $V_{RRM}$ reapplied			1030			
Maximum $I^2t$ for fusing per leg	$I^2t$	$t = 10 \text{ ms}$	No voltage reapplied			6840	$\text{A}^2\text{s}$		
		$t = 8.3 \text{ ms}$	100 % $V_{RRM}$ reapplied			6225			
		$t = 10 \text{ ms}$	No voltage reapplied			4840			
		$t = 8.3 \text{ ms}$	100 % $V_{RRM}$ reapplied			4400			
Maximum $I^2\sqrt{t}$ for fusing per leg	$I^2\sqrt{t}$	$t = 0.1 \text{ ms to } 10 \text{ ms, no voltage reapplied}$				68 440	$\text{A}^2\sqrt{\text{s}}$		
Low level of threshold voltage per leg	$V_{F(TO)1}$	$(16.7\% \times \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum				0.75	V		
Low level value of forward slope resistance	$r_{f1}$					4.93	$\text{m}\Omega$		
High level of threshold voltage per leg	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum				0.84	V		
High level value of forward slope resistance	$r_{f2}$					4.85	$\text{m}\Omega$		
Maximum forward voltage drop per leg	$V_{FM}$	$I_{FM} = 110 \text{ A, } T_J = 25 \text{ °C}$				1.31	V		
		$I_{FM} = 110 \text{ A, } T_J = 150 \text{ °C}$				1.24			

**BLOCKING**

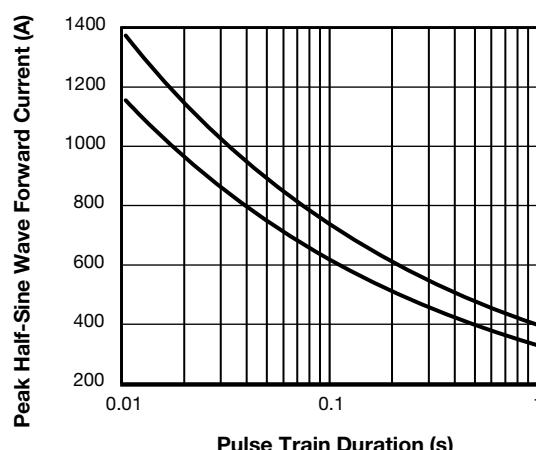
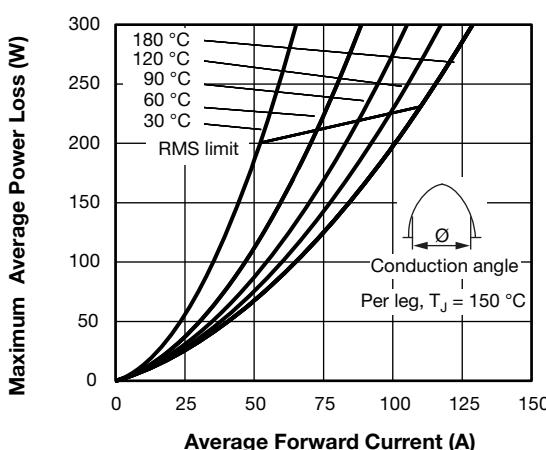
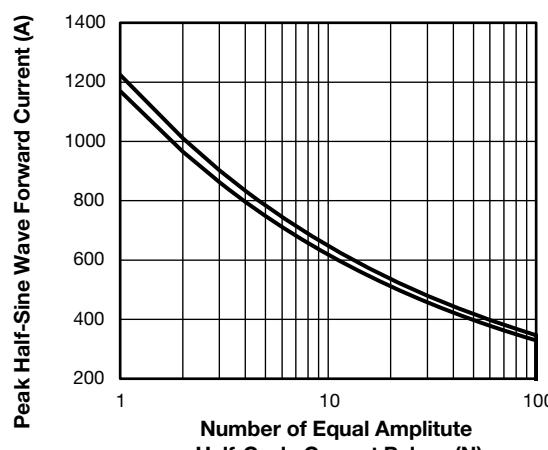
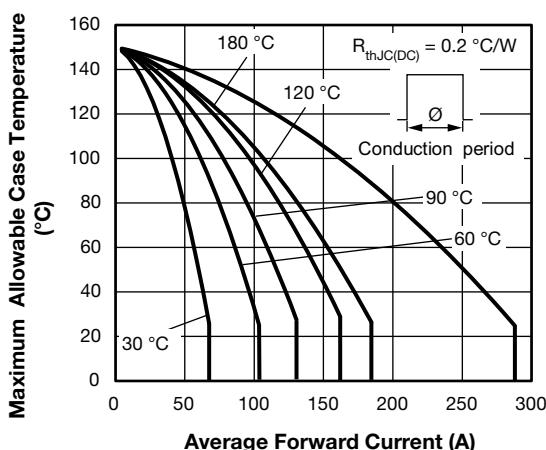
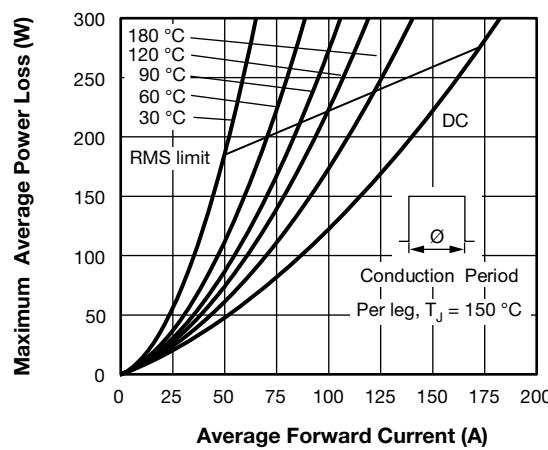
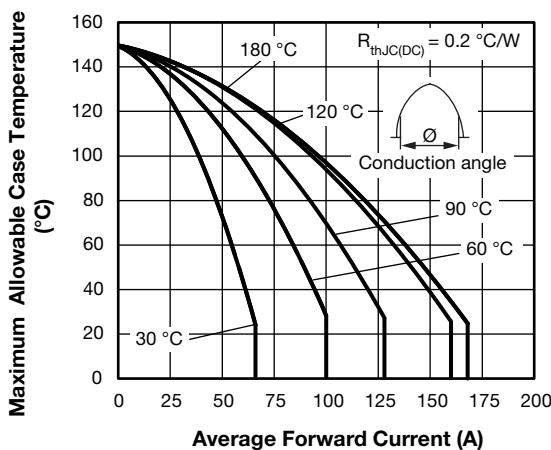
PARAMETER	SYMBOL	TEST CONDITIONS				VALUES	UNITS
Maximum peak reverse leakage current per leg	$I_{RRM}$	$T_J = 25 \text{ °C}$				150	$\mu\text{A}$
		$T_J = 150 \text{ °C}$				1.5	mA
RMS insulation voltage	$V_{INS}$	$T_J = 25 \text{ °C}$ , any terminal to case, $t = 1 \text{ minute}$				2500	V

**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	per leg	$R_{thJC}$	-	-	0.2	$^{\circ}\text{C/W}$
	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			

 **$\Delta R$  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



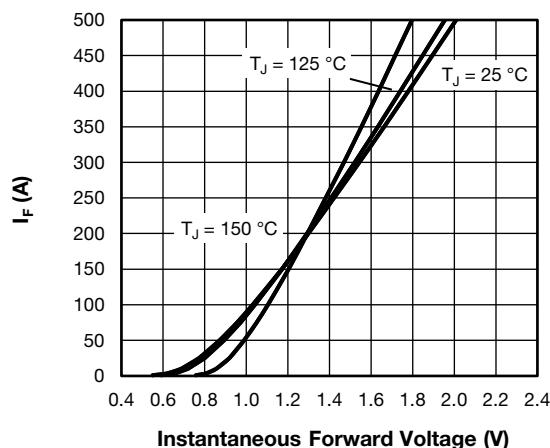


Fig. 7 - Typical Forward Voltage Characteristics

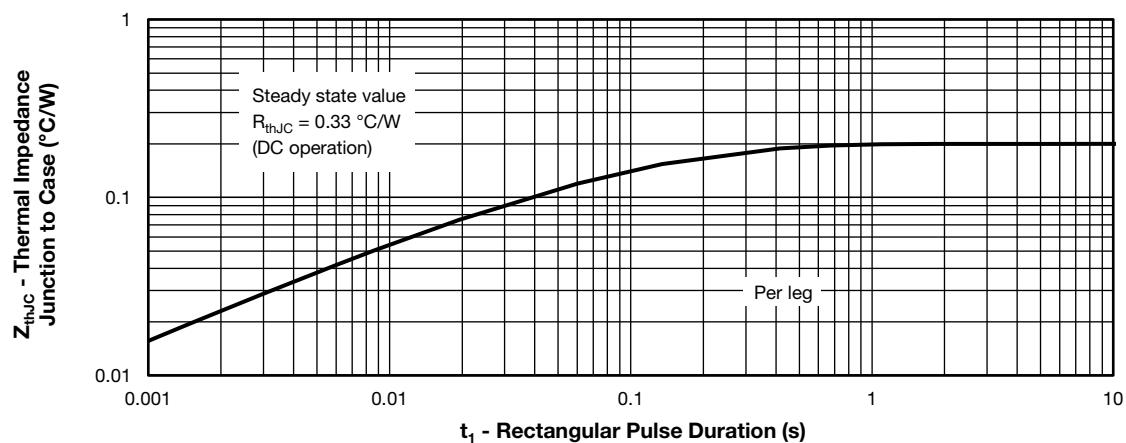
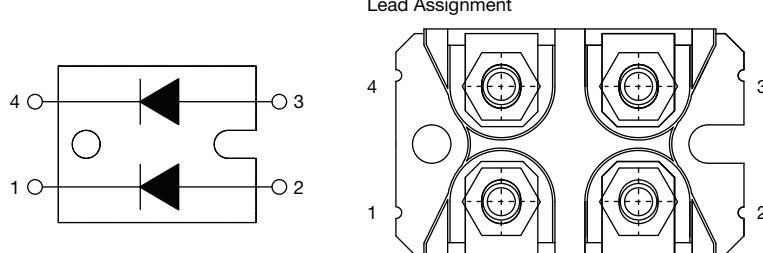


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

Device code	VS-	R	A	220	F	A	120
	(1)	(2)	(3)	(4)	(5)	(6)	(7)

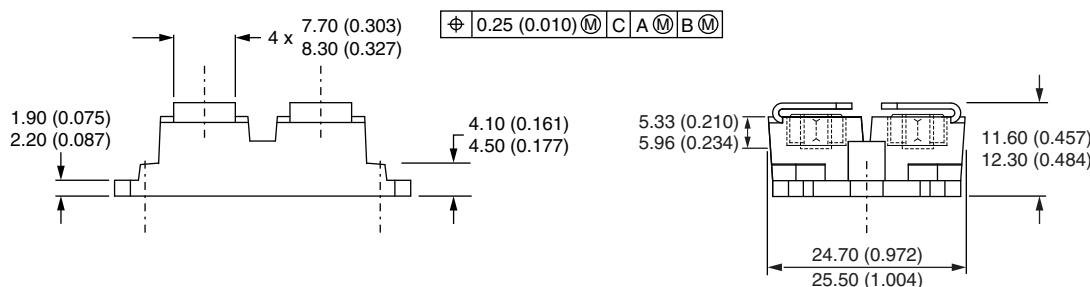
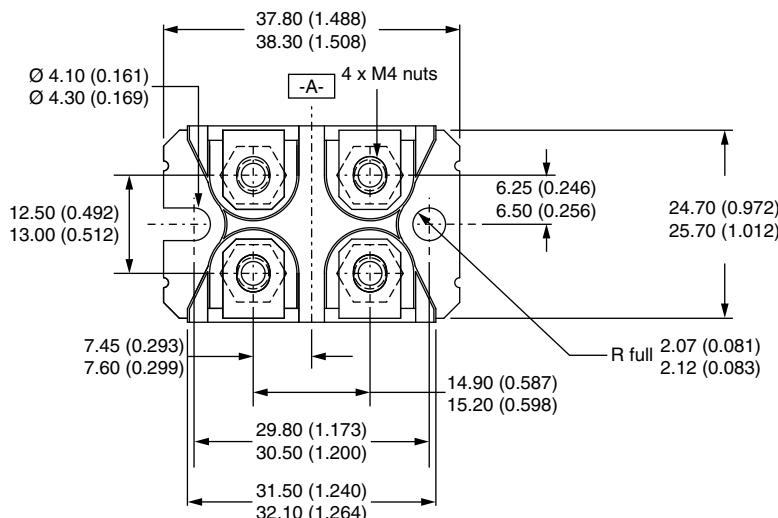
- 1** - Vishay Semiconductors product
- 2** - Standard recovery diode
- 3** - Present silicon generation
- 4** - Current rating (220 = 220 A)
- 5** - Circuit configuration (2 separate diodes, parallel pin-out)
- 6** - Package indicator (SOT-227 standard insulated base)
- 7** - Voltage rating (120 = 1200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

CIRCUIT CONFIGURATION		
CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Two separate diodes, parallel pin-out	F	<p>Lead Assignment</p> 

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95423">www.vishay.com/doc?95423</a>
Packaging information	<a href="http://www.vishay.com/doc?95425">www.vishay.com/doc?95425</a>

## SOT-227 Generation 2

**DIMENSIONS** in millimeters (inches)



**Note**

- Controlling dimension: millimeter

## Disclaimer

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