

SOT-227 Power Module Insulated Standard Recovery Rectifier, 160 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	160 A, $T_C = 101^\circ\text{C}$
V_{FM} typical at 100 A	1.16 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 $^\circ\text{C}$	91	A
$I_{F(RMS)}$		138	
I_{FSM}	50 Hz	940	
	60 Hz	985	
I^2t	50 Hz	4420	A^2s
	60 Hz	4015	
$I^2\sqrt{t}$		44 180	$\text{A}^2\sqrt{\text{s}}$
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-RA160FA120	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				91	A		
Maximum RMS forward current per leg	$I_{F(RMS)}$	DC at 101 °C case temperature				138			
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		940	A		
		$t = 8.3 \text{ ms}$				985			
		$t = 10 \text{ ms}$	100 % V_{RRM} reapplied			790			
		$t = 8.3 \text{ ms}$				825			
Maximum I^2t for fusing per leg	I^2t	$t = 10 \text{ ms}$	No voltage reapplied			4420	A^2s		
		$t = 8.3 \text{ ms}$				4015			
		$t = 10 \text{ ms}$	100 % V_{RRM} reapplied			3125			
		$t = 8.3 \text{ ms}$				2840			
Maximum $I^2\sqrt{t}$ for fusing per leg	$I^2\sqrt{t}$	$t = 0.1 \text{ ms to } 10 \text{ ms, no voltage reapplied}$				44 180	$\text{A}^2\sqrt{\text{s}}$		
Low level of threshold voltage per leg	$V_{F(TO)1}$	$(16.7 \% \times \pi \times I_{F(AV)}) < I < \pi \times I_{F(AV)}$, $T_J = T_J$ maximum				0.80	V		
Low level value of forward slope resistance	r_{f1}					4.32	$\text{m}\Omega$		
High level of threshold voltage per leg	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum				0.93	V		
High level value of forward slope resistance	r_{f2}					4.14	$\text{m}\Omega$		
Maximum forward voltage drop per leg	V_{FM}	$I_{FM} = 100 \text{ A, } T_J = 25 \text{ °C}$				1.27	V		
		$I_{FM} = 100 \text{ A, } T_J = 150 \text{ °C}$				1.22			

BLOCKING

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

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case per leg	R_{thJC}	-	-	0.26	$^{\circ}\text{C/W}$
		-	-	0.13	
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-RA160FA120	0.109	0.122	0.149	0.213	0.355	0.069	0.119	0.159	0.223	0.358	°C/W

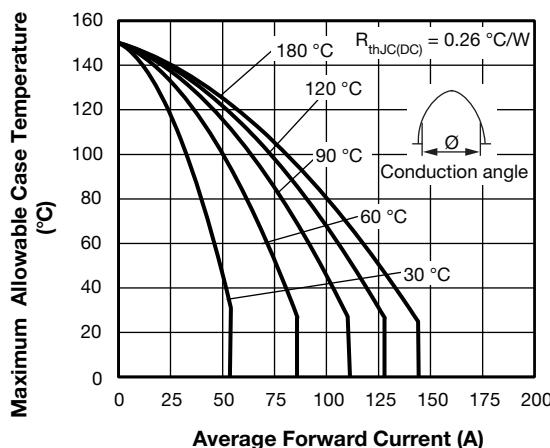


Fig. 1 - Current Ratings Characteristics (A)

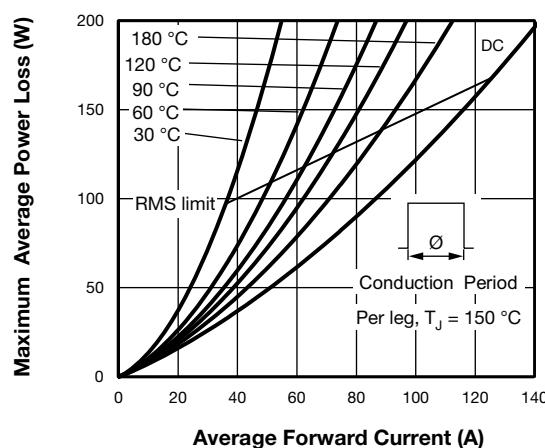


Fig. 4 - Forward Power Loss Characteristics

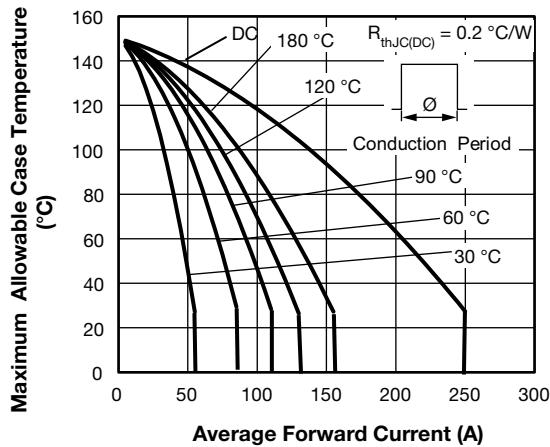


Fig. 2 - Current Ratings Characteristics (A)

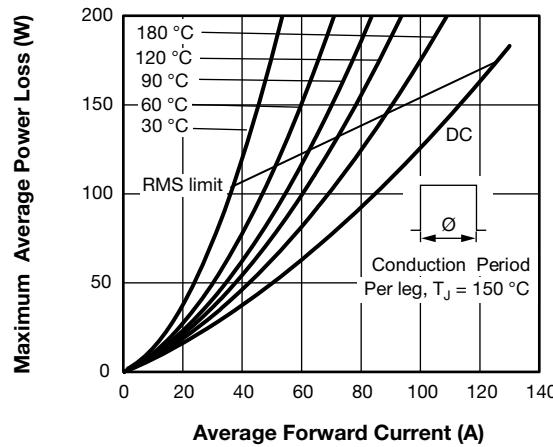


Fig. 5 - Forward Power Loss Characteristics

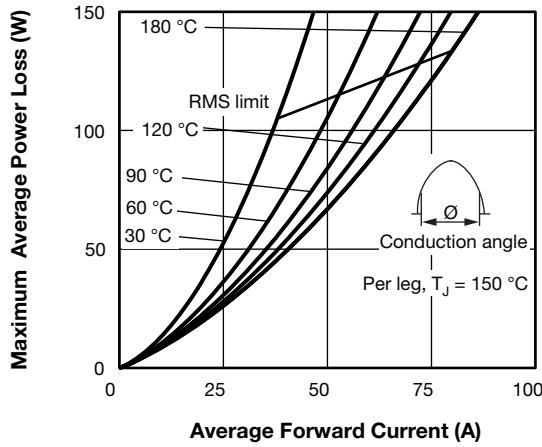


Fig. 3 - Current Ratings Characteristics (A)

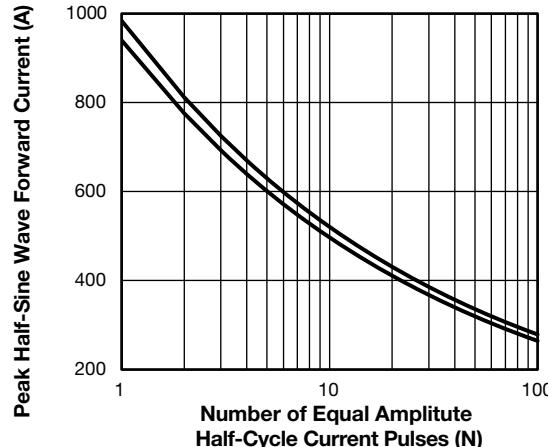


Fig. 6 - Maximum Non-Repetitive Surge Current

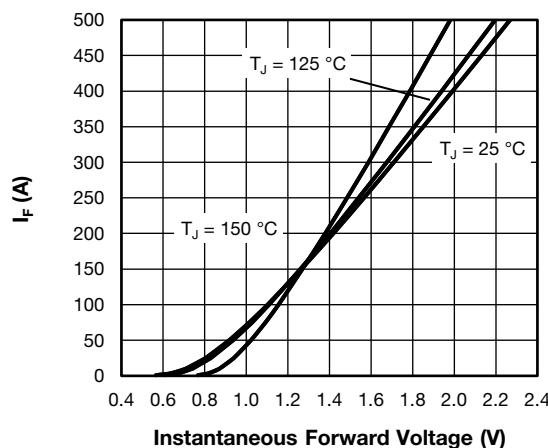


Fig. 7 - Typical Forward Voltage Characteristics

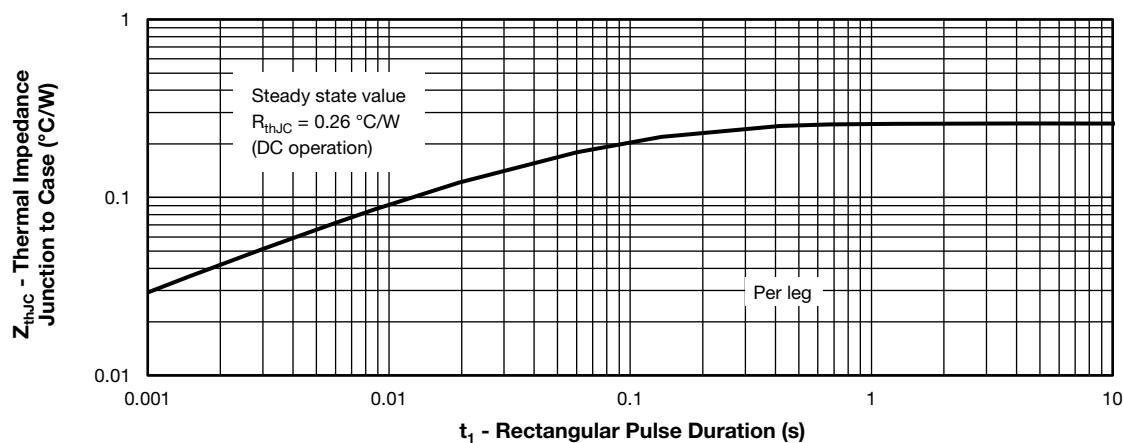
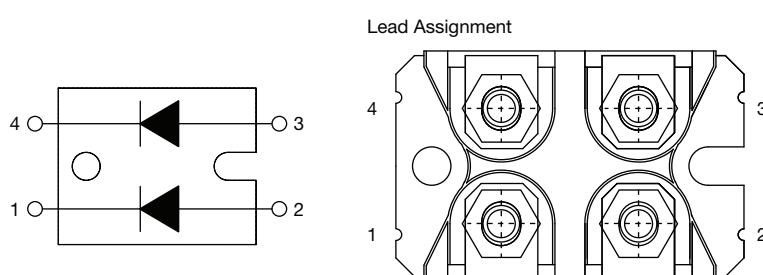


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	R	A	160	F	A	120
	(1)	(2)	(3)	(4)	(5)	(6)	(7)

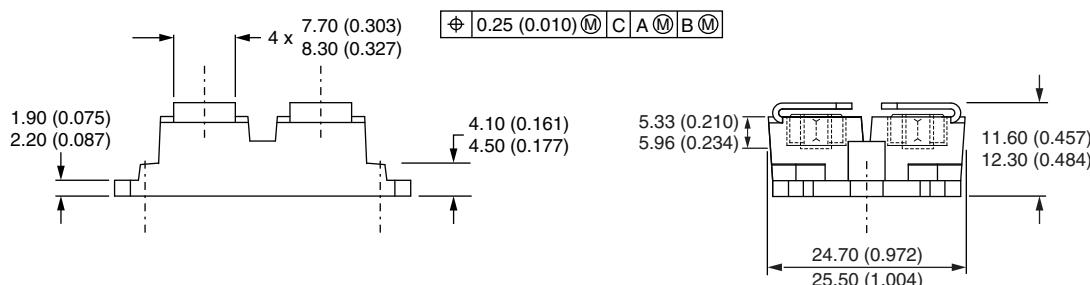
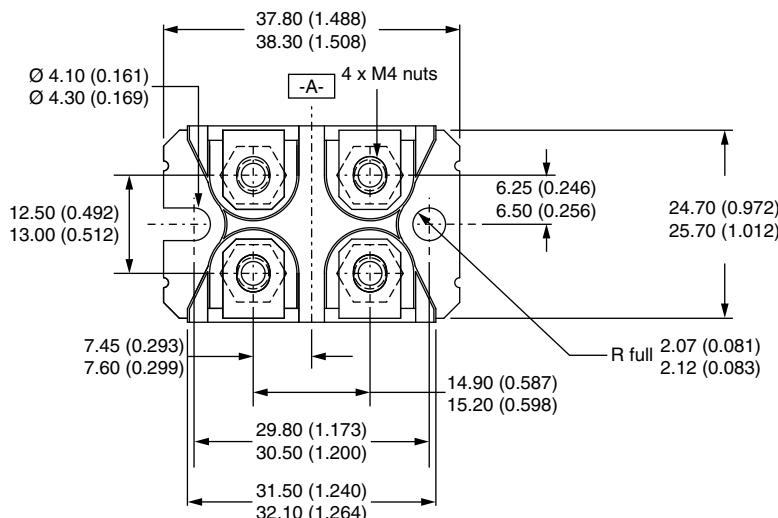
- 1** - Vishay Semiconductors product
- 2** - Standard recovery diode
- 3** - Present silicon generation
- 4** - Current rating (160 = 160 A)
- 5** - Circuit configuration (2 separate diodes, parallel pin-out)
- 6** - Package indicator (SOT-227 standard insulated base)
- 7** - Voltage rating (120 = 1200 V)

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

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

SOT-227 Generation 2

DIMENSIONS in millimeters (inches)



Note

- Controlling dimension: millimeter

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