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 °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 °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	$A^2\sqrt{s}$
V_{RRM}		1200	V
T_J		-55 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-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	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	940	
		t = 8.3 ms			985	
		t = 10 ms	100 % V_{RRM} reapplied		790	
		t = 8.3 ms			825	
Maximum I^2t for fusing per leg	I^2t	t = 10 ms	No voltage reapplied		4420	A^2s
		t = 8.3 ms			4015	
		t = 10 ms	100 % V_{RRM} reapplied		3125	
		t = 8.3 ms			2840	
Maximum $I^2\sqrt{t}$ for fusing per leg	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			44 180	$A^2\sqrt{s}$
Low level of threshold voltage per leg	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)}$) < I < π x $I_{F(AV)}$, $T_J = T_J$ maximum			0.80	V
Low level value of forward slope resistance	r_{f1}				4.32	mΩ
High level of threshold voltage per leg	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.93	V
High level value of forward slope resistance	r_{f2}				4.14	mΩ
Maximum forward voltage drop per leg	V_{FM}	I_{FM} = 100 A, T_J = 25 °C			1.27	V
		I_{FM} = 100 A, T_J = 150 °C			1.22	

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 AND MECHANICAL SPECIFICATIONS						
PARAMETER		**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Thermal resistance, junction to case	per leg	R_{thJC}	-	-	0.26	°C/W
	per module		-	-	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

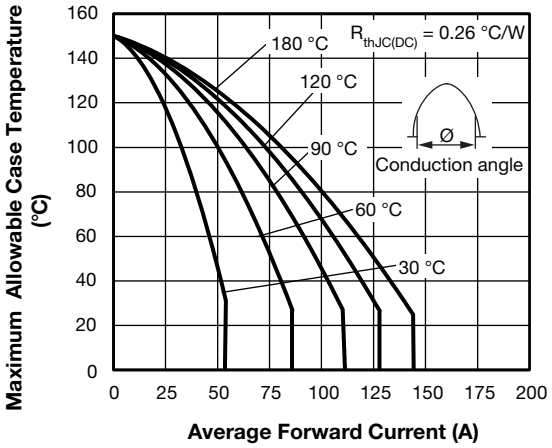


Fig. 1 - Current Ratings Characteristics (A)

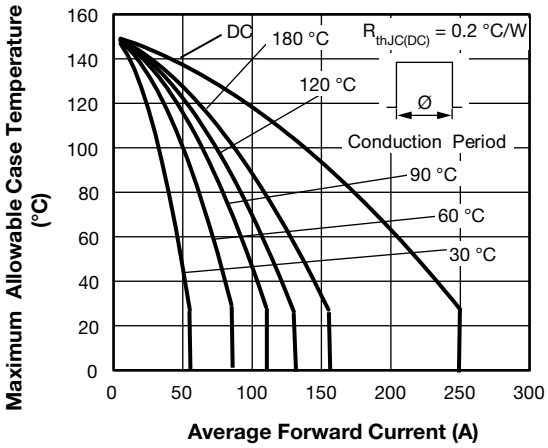


Fig. 2 - Current Ratings Characteristics (A)

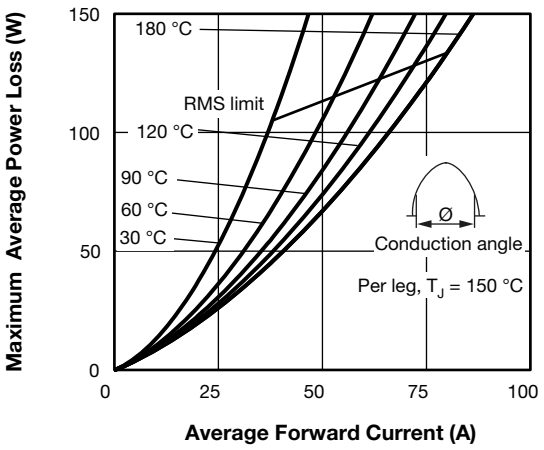


Fig. 3 - Current Ratings Characteristics (A)

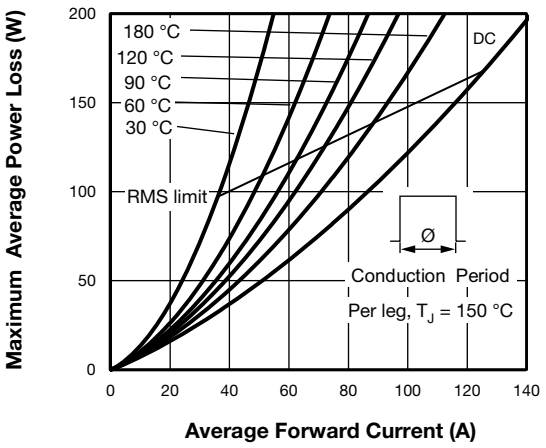


Fig. 4 - Forward Power Loss Characteristics

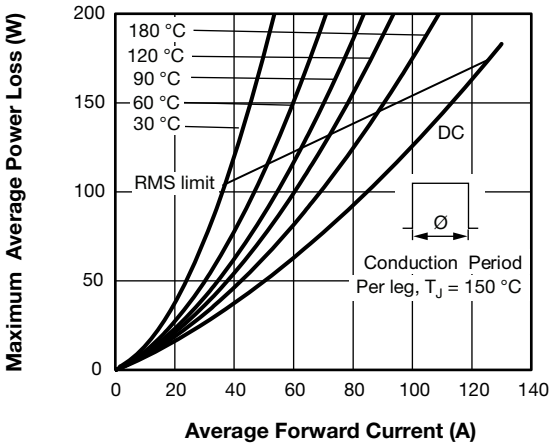


Fig. 5 - Forward Power Loss Characteristics

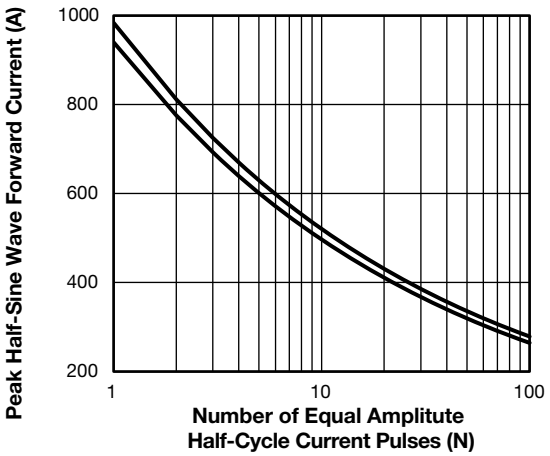


Fig. 6 - Maximum Non-Repetitive Surge Current

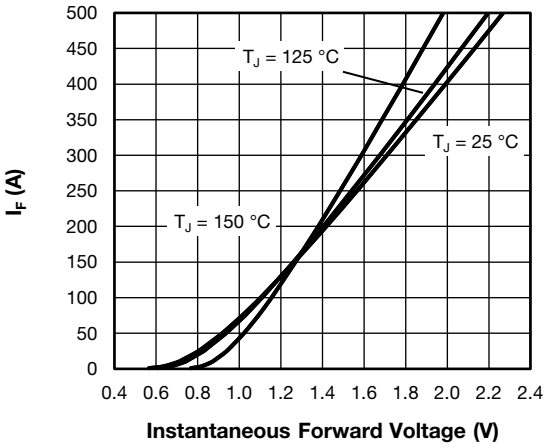


Fig. 7 - Typical Forward Voltage Characteristics

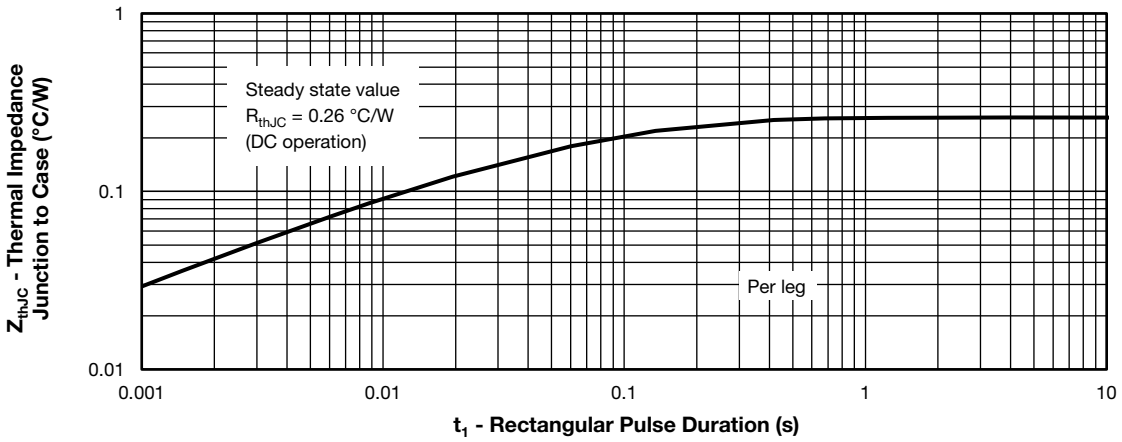


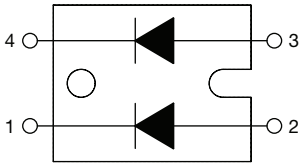
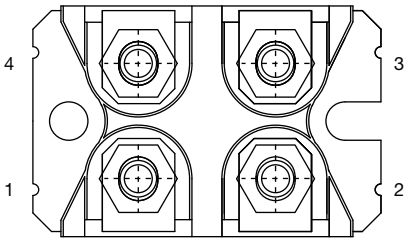
Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

VS-	R	A	160	F	A	120
1	2	3	4	5	6	7

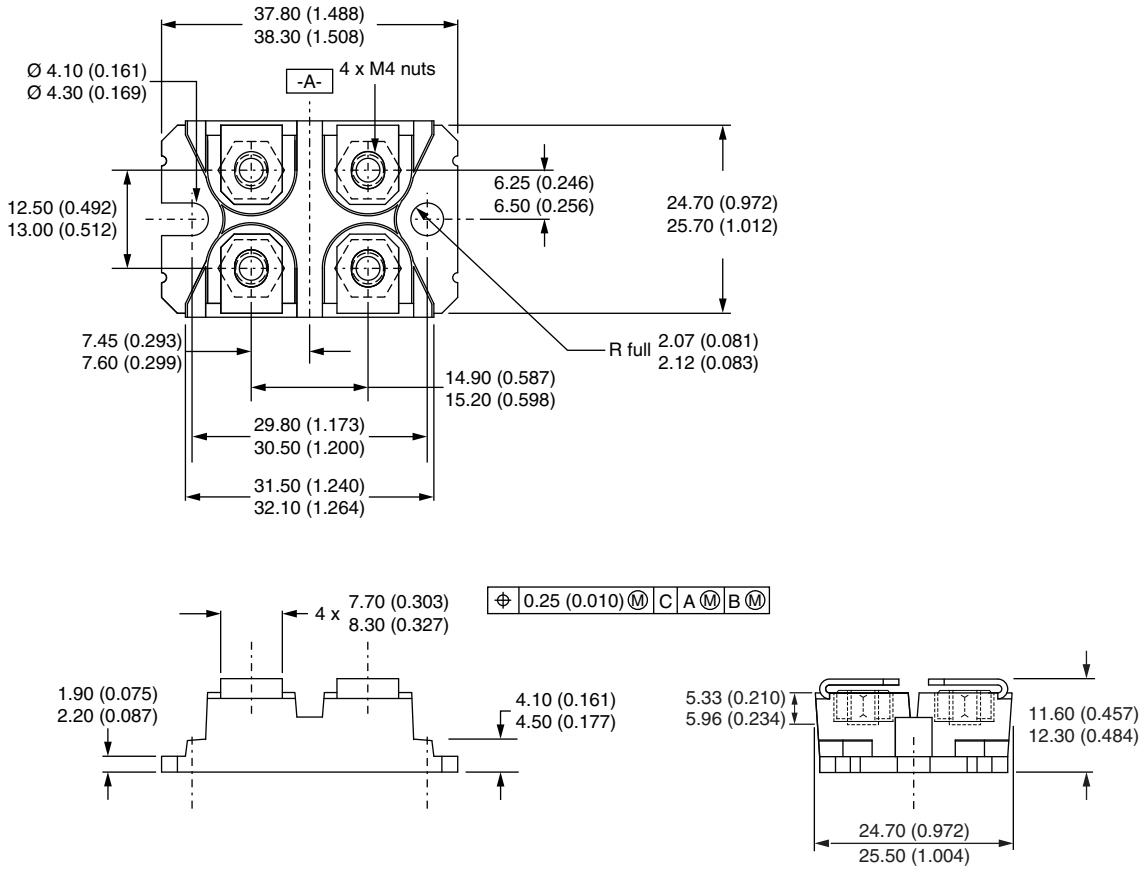
1 - Vishay Semiconductors product
2 - Standard recovery diode
3 - Present silicon generation
4 - Current rating (160 = 160 A)
5 - Circuit configuration (2 separate diodes, parallel pin-out)
6 - Package indicator (SOT-227 standard insulated base)
7 - Voltage rating (120 = 1200 V)

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

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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