


SOT-227 Silicon Carbide Schottky Barrier Diode, 650 V, 240 A


SOT-227

PRIMARY CHARACTERISTICS	
V_R	650 V
V_F (typical) at 120 A, per diode	1.40 V
Q_C (typical), per diode	328 nC
$I_{F(DC)}$ per module at $T_C = 117\text{ }^\circ\text{C}$	240 A
Type	Modules - diode, SiC Schottky
Package	SOT-227
Circuit configuration	Two separate diodes, parallel pin-out

FEATURES

- Virtually no recovery tail and no switching losses
- Majority carrier diode using Schottky technology on SiC wide band gap material
- Improved V_F and efficiency by thin wafer technology
- High speed switching, low switching losses
- Positive temperature coefficient, for easy paralleling
- Electrically isolated base plate
- Large creepage distance between terminal
- Simplified mechanical designs, rapid assembly
- Designed and qualified for industrial level
- UL approved file E78996 
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**
DESCRIPTION / APPLICATIONS

Wide band gap SiC based 650 V Schottky diode, designed for high performance and ruggedness.

Optimum choice for high speed hard switching and efficient operation over a wide temperature range, it is also recommended for all applications suffering from Silicon ultrafast recovery behavior.

Typical applications include AC/DC PFC and DC/DC ultra high frequency output rectification in FBPS and LLC converters

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Cathode to anode voltage	V_R		650	V
Continuous forward current per diode	I_F	$T_C = 117\text{ }^\circ\text{C}$	120	A
Single pulse forward current per diode	I_{FSM}	$T_J = 25\text{ }^\circ\text{C}$, 6 ms square pulse	675	
Maximum power dissipation per module	P_D	$T_C = 117\text{ }^\circ\text{C}$	483	W
RMS isolation voltage	V_{ISOL}	Any terminal to case, $t = 1\text{ min}$	2500	V
Operating junction and storage temperature range	T_J, T_{Stg}		-55 to +175	$^\circ\text{C}$

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V_{BR}	$I_R = 600\text{ }\mu\text{A}$	650	-	-	V
Forward voltage	V_{FM}	$I_F = 120\text{ A}$	-	1.40	1.61	
		$I_F = 120\text{ A}$, $T_J = 150\text{ }^\circ\text{C}$	-	1.64	-	
Reverse leakage current	I_{RM}	$V_R = 650\text{ V}$	-	5.2	240	μA
		$T_J = 125\text{ }^\circ\text{C}$, $V_R = 650\text{ V}$	-	18.2	-	
		$T_J = 150\text{ }^\circ\text{C}$, $V_R = 650\text{ V}$	-	26.6	-	
Junction capacitance	C_T	$V_R = 650\text{ V}$, $f = 1\text{ MHz}$	-	479	-	pF



DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Total capacitive charge	Q_C	$V_R = 400\text{ V}$	-	328	-	nC

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance junction to case, per diode	R_{thJC}		-	-	0.25	$^\circ\text{C/W}$
Thermal resistance junction to case, per module			-	-	0.12	
Thermal resistance case to heatsink, per module	R_{thCS}	Flat, greased surface	-	0.05	-	
Weight			-	30	-	g
Mounting torque		Torque per diode	-	-	1.1 (9.7)	Nm (lbf.in)
		Torque to heatsink	-	-	1.8 (15.9)	Nm (lbf.in)
Case style			SOT-227			

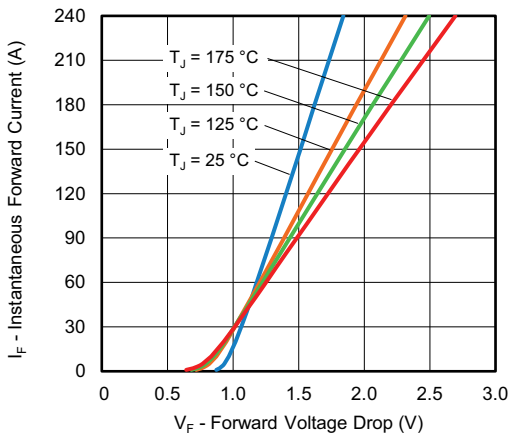


Fig. 1 - Typical Forward Voltage Drop Characteristics

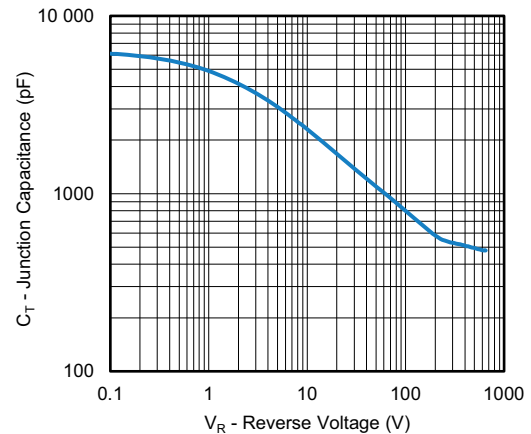


Fig. 3 - Junction Capacitance vs. Reverse Voltage

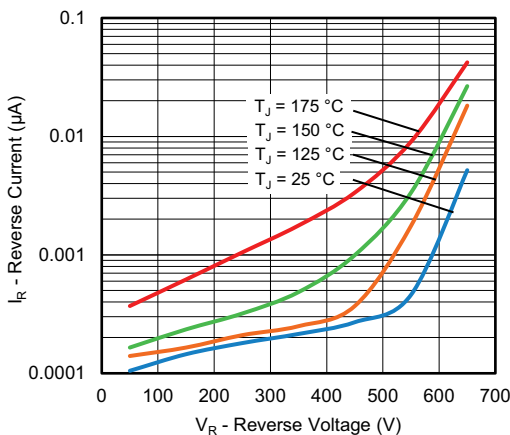


Fig. 2 - Typical Values Reverse Current vs. Reverse Voltage

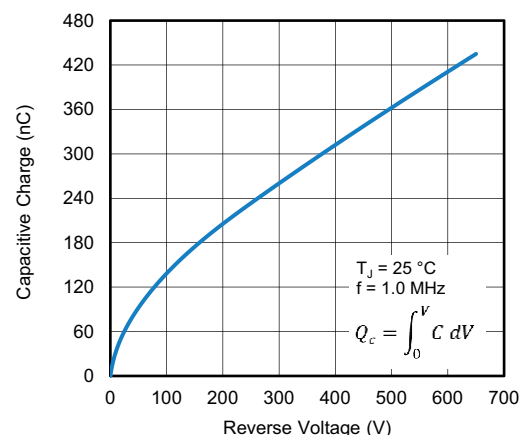


Fig. 4 - Typical Capacitive Charge vs. Reverse Voltage

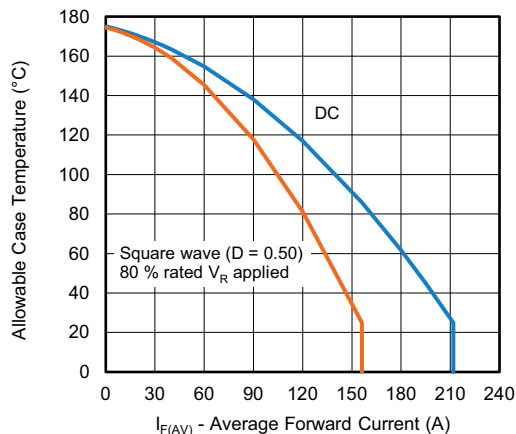


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

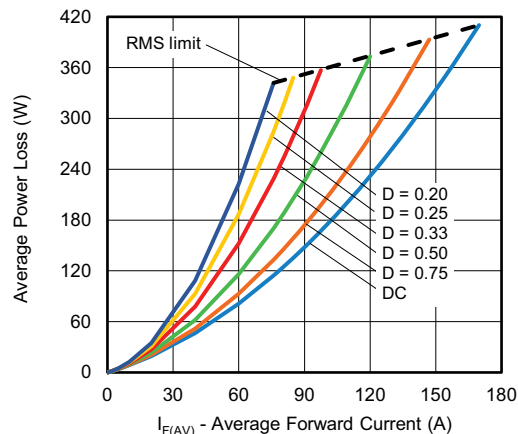


Fig. 6 - Forward Power Loss Characteristics

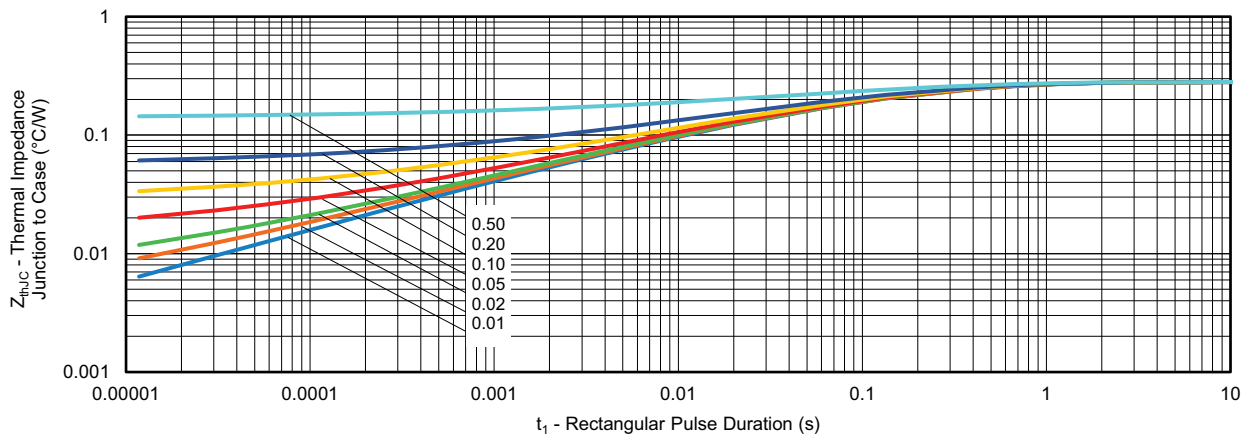


Fig. 7 - Maximum Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	SC	240	F	A	65
	①	②	③	④	⑤	⑥

- 1** - Vishay Semiconductors product
- 2** - SC = SiC Schottky Barrier Diode
- 3** - Current rating per module (240 = 240 A)
- 4** - F = circuit configuration (two separate diodes, parallel pin-out)
- 5** - Package indicator (SOT-227 standard insulated base)
- 6** - Voltage rating (65 = 650 V)



CIRCUIT CONFIGURATION		
CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Two separate diodes, parallel pin-out	F	<p>The circuit drawing shows two diodes connected in parallel. The left diode has its cathode to the left and anode to the right. The right diode has its cathode to the right and anode to the left. The four pins are labeled 1, 2, 3, and 4. Pin 1 is the left cathode, pin 2 is the right anode, pin 3 is the right cathode, and pin 4 is the left anode. To the right is a lead assignment diagram of the component's physical package, showing four leads labeled 1, 2, 3, and 4 corresponding to the diode connections.</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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