SOT-227 Silicon Carbide Schottky Barrier Diode, 650 V, 40 A

SOT-227

PRIMARY CHARACTERISTICS	
V_R	650 V
V_F (typical) at 20 A, per diode	1.36 V
Q_C (typical), per diode	56 nC
$I_{F(DC)}$ per module at T_C = 136 °C	40 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

Pb-free

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 = 136 °C	20	A
Single pulse forward current per diode	I_{FSM}	T_J = 25 °C, 6 ms square pulse	105	
Maximum power dissipation per module	P_D	T_C = 136 °C	74	W
RMS isolation voltage	V_{ISOL}	Any terminal to case, t = 1 min	2500	V
Operating junction and storage temperature range	T_J, T_{Stg}		-55 to +175	°C

ELECTRICAL SPECIFICATIONS (T_J = 25 °C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V_{BR}	I_R = 100 µA	650	-	-	V
Forward voltage	V_{FM}	I_F = 20 A	-	1.36	1.55	
		I_F = 20 A, T_J = 150 °C	-	1.57	-	
Reverse leakage current	I_{RM}	V_R = 650 V	-	1	40	µA
		T_J = 125 °C, V_R = 650 V	-	3.1	-	
		T_J = 150 °C, V_R = 650 V	-	4.6	-	
Junction capacitance	C_T	V_R = 650 V, f = 1 MHz	-	82	-	pF

DYNAMIC RECOVERY CHARACTERISTICS (T_J = 25 °C unless otherwise specified)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Total capacitive charge	Q_C	V_R = 400 V	-	56	-	nC

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Thermal resistance junction to case, per diode	R_{thJC}		-	-	1.06	°C/W
Thermal resistance junction to case, per module			-	-	0.53	
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			

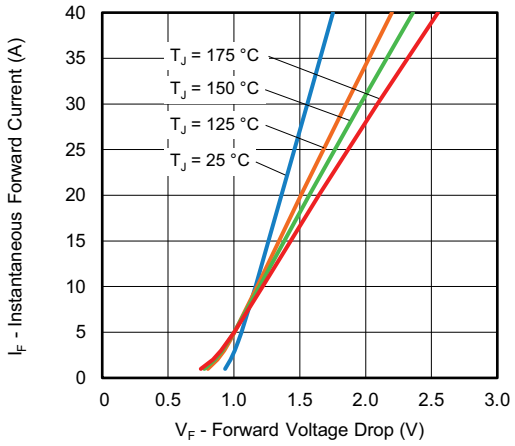


Fig. 1 - Typical Forward Voltage Drop Characteristics

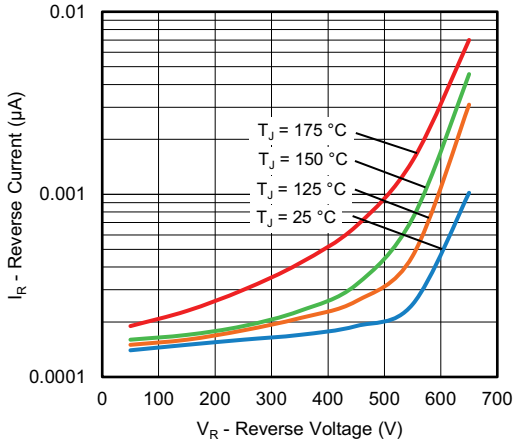


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

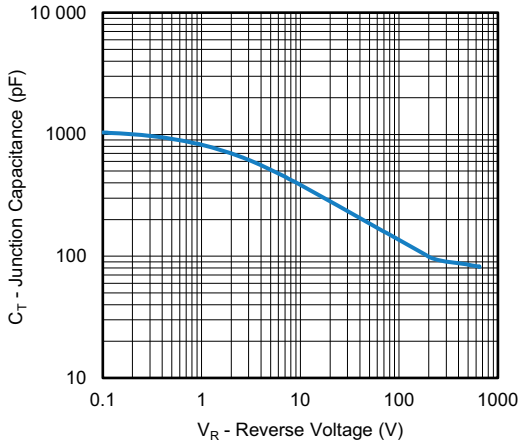


Fig. 3 - Junction Capacitance vs. Reverse Voltage

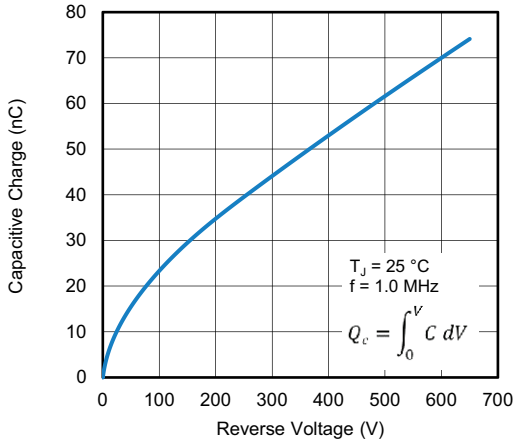


Fig. 4 - Typical Capacitive Charge vs. Reverse Voltage

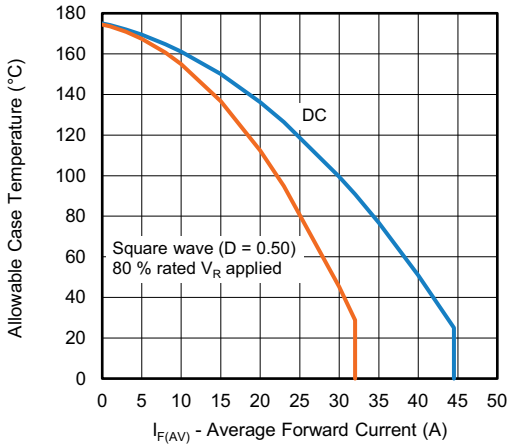


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

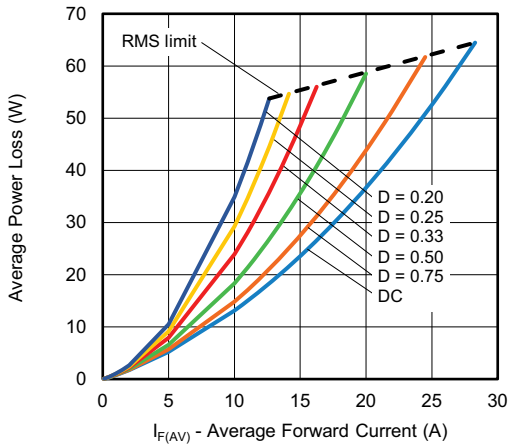


Fig. 6 - Forward Power Loss Characteristics

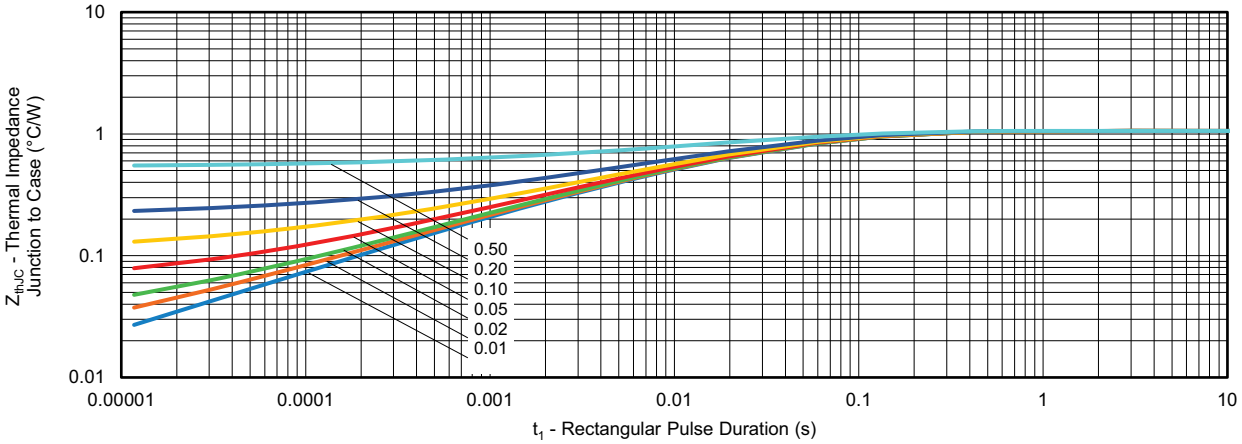


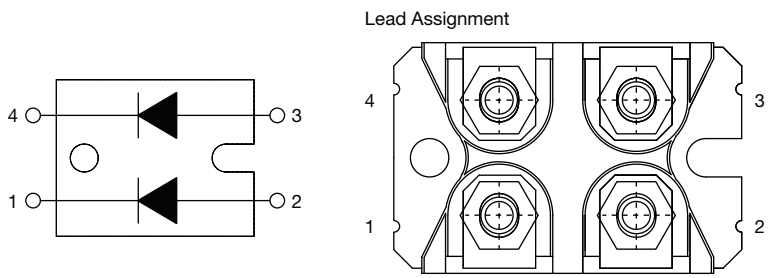
Fig. 7 - Maximum Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

VS-	SC	40	F	A	65
1	2	3	4	5	6

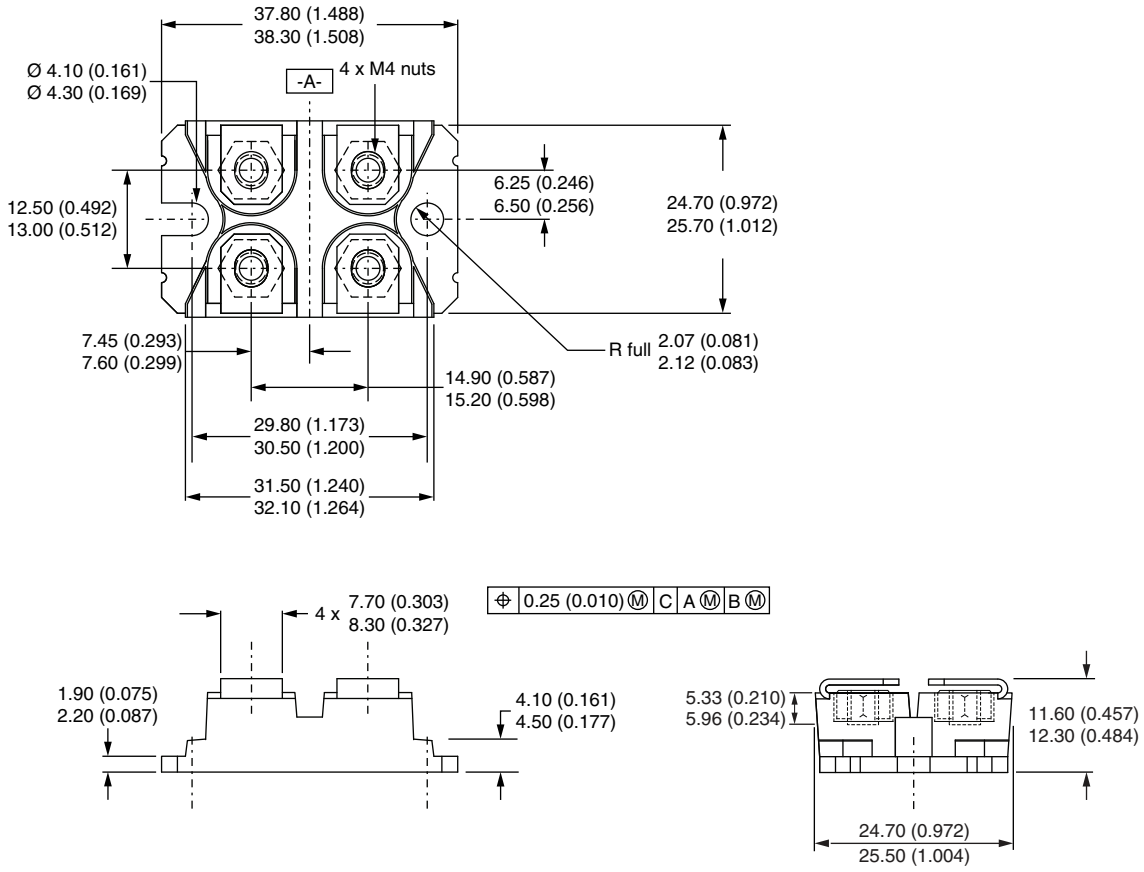
1 - Vishay Semiconductors product
2 - SC = SiC Schottky Barrier Diode
3 - Current rating per module (40 = 40 A)
4 - F = circuit configuration (two separate diodes, parallel pin-out)
5 - Package indicator (SOT-227 standard insulated base)
6 - Voltage rating (65 = 650 V)

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

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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