SD50N17S1

1700V 50A

SIC POWER

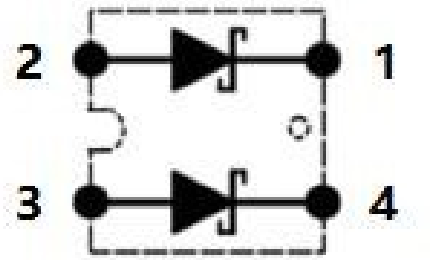
SCHOTTKY RECTIFIER



SOT-227

Description

SD50N17S1 is a SiC Schottky rectifier packaged in SOT-227 case. The device is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The SD50N17S1 is ideal for energy sensitive, high frequency applications in challenging environments.



Circuit Diagram

Features

- 175°C T_J operation
- Ultra-low switching loss
- Switching speeds independent of operating temperature
- Low total conduction losses
- High forward surge current capability
- Copper internally DBC isolated
- Base plate: Nickel plated; Terminals: Nickel plated
- Pb − Free Device

Typical Applications

- Alternative energy inverters
- Power Factor Correction (PFC)
- Free-Wheeling diodes
- Switching supply output rectification
- Reverse polarity protection

Maximum Ratings

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage(per leg)	V_{RRM} V_{RWM} V_R	-	1700	V
Average Rectified Forward Current(per leg)	$I_{F(AV)1}$	T_C=25°C	54	A
	$I_{F(AV)2}$	T_C=137°C	25	A
Peak One Cycle Non-Repetitive Surge Current(per leg)	I_{FSM1}	10ms, Half Sine pulse, T_C=25°C	280	A
	I_{FSM2}	10ms, Half Sine pulse, T_C=110°C	210	A
Repetitive Peak Forward Surge Current(per leg)	I_{FRM1}	10ms, Half Sine pulse , T_C=25°C	168	A
	I_{FRM2}	10ms, Half Sine pulse , T_C=110°C	122	A
Power Dissipation(per leg)	P_{tot1}	T_C=25°C	263	W
	P_{tot2}	T_C=110°C	114	W
I^2t Value(per leg)	$\int i^2t1$	10ms, Tc=25°C	312	A^2s
	$\int i^2t2$	10ms, Tc=25°C	310	A^2s
Isolation Voltage	V_{ISOL}	Ac.50Hz, R.M.S;1min, T_J= 25°C	2500	V
		Ac.50Hz, R.M.S;1sec, T_J= 25°C	3500	

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*(per leg)	V_{F1}	@ 25A, Pulse, T_J= 25°C	1.55	1.8	V
	V_{F2}	@ 25A, Pulse, T_J= 175°C	2.5	3.0	V
Reverse Current*(per leg)	I_{R1}	@V_R= rated V_R, T_J= 25°C	1	10	uA
	I_{R2}	@V_R= rated V_R, T_J= 175°C	20	200	uA
Junction Capacitance(per leg)	C_T	VR=0V, f=1MHz, Tj=25°C,	2252	-	pF
Reverse Recovery Charge(per leg)	Q_c	V_R= 1700 V, T_J=25°C	279	-	nC
Capacitance Stored Energy(per leg)	E_C	V_R= 1700 V, T_J=25°C	303	-	μJ

* Pulse width < 300 μs, duty cycle < 2%

Thermal-Mechanical Specifications:

Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T_J	-	-55 to +175	°C
Storage Temperature	T_{stg}	-	-55 to +175	°C
Typical Thermal Resistance Junction to Case(per leg)	$R_{\theta JC}$	DC operation, Tj=25°C	0.57	°C/W

Ratings and Characteristics Curves(per leg)

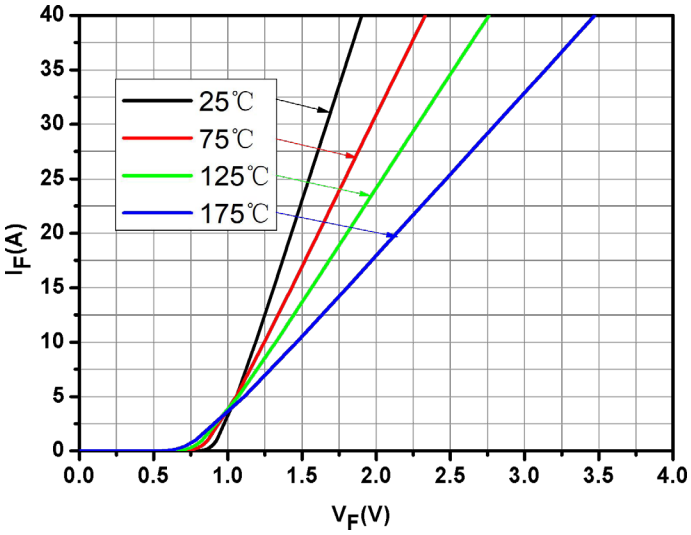


Fig.1-Typical Forward Voltage Characteristics

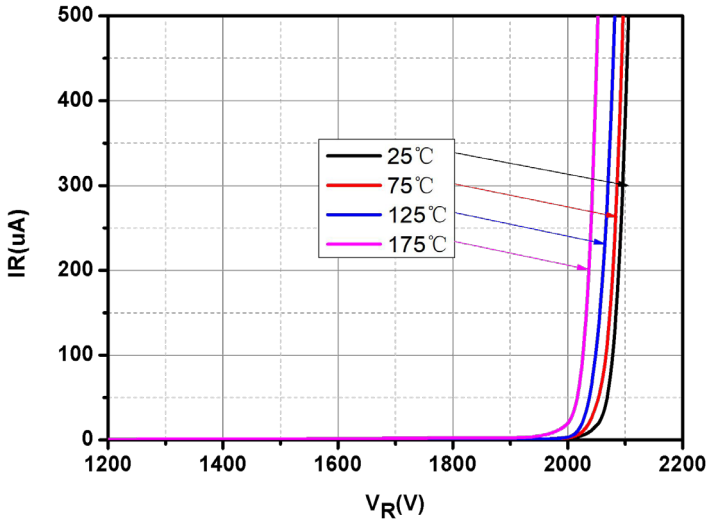


Fig.2-Typical Reverse Characteristics

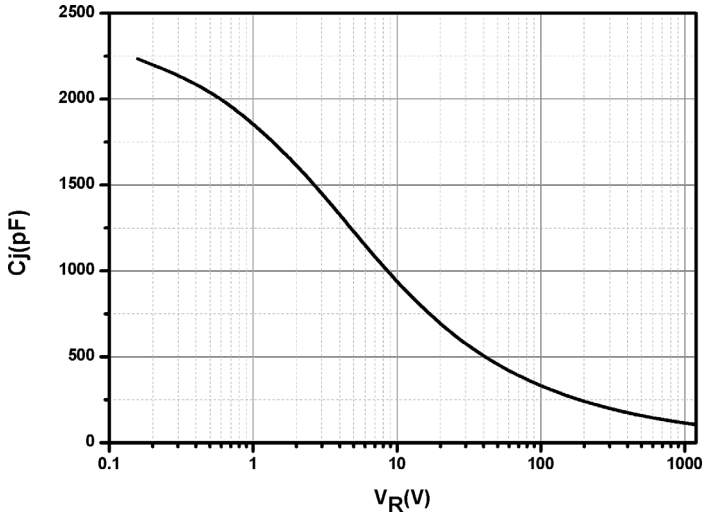


Fig.3-Capacitance vs. Reverse Voltage

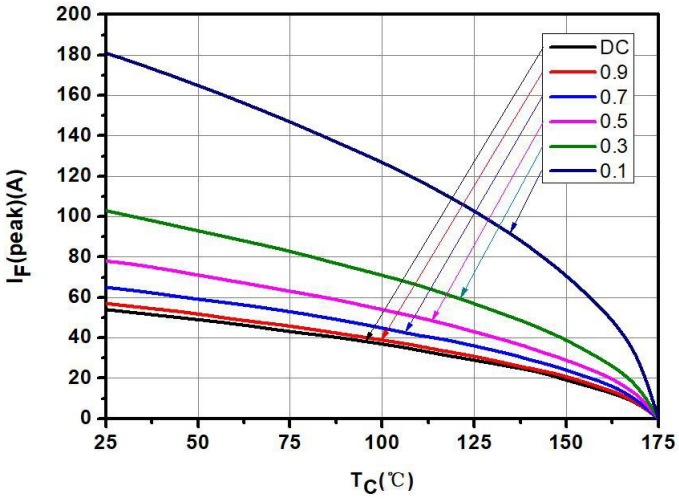


Fig.4-Current Derating

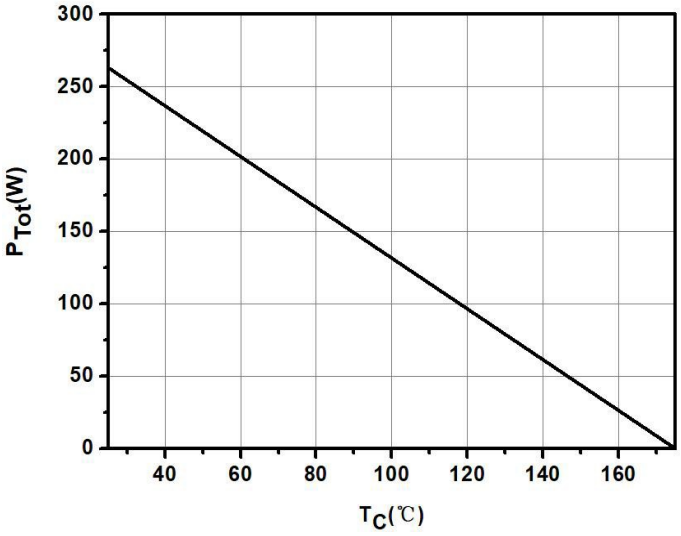


Fig.5-Power Derating

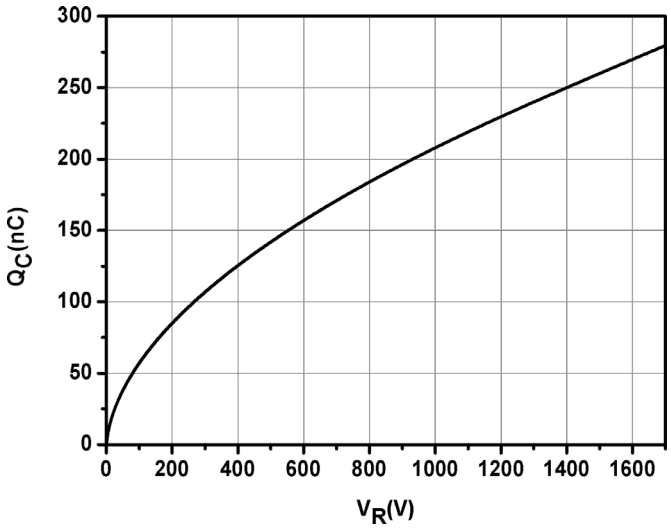


Fig.6-Total Capacitance Charge vs. Reverse Voltage

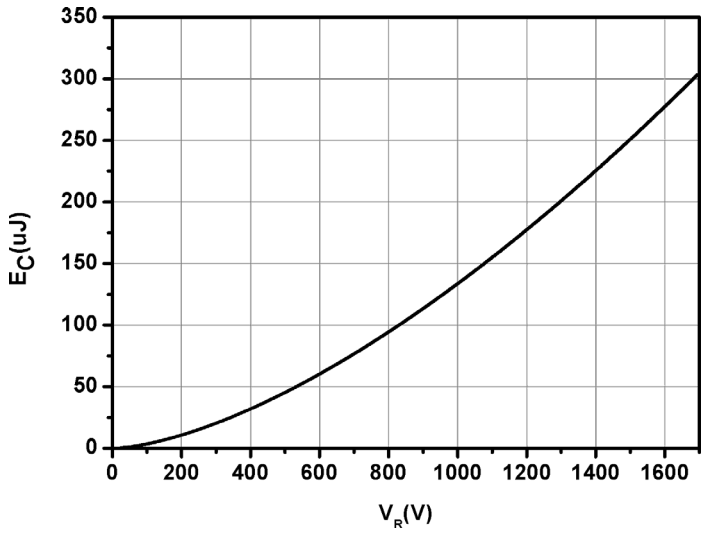
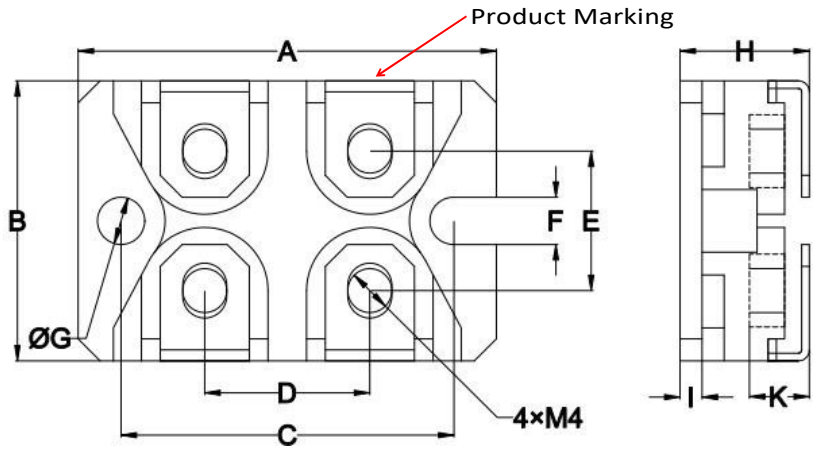


Fig.7-Capacitance Stored Energy

Mechanical Dimensions SOT-227



SYMBOL	Dimensions in millimeters	
	Min.	Max.
A	37.8	38.2
B	24.8	25.2
C	29.9	30.5
D	14.5	15.5
E	12.2	13.2
F	4.1	4.31
G	φ4.1	φ4.31
H	11	12.5
I	1.9	2.1
K	4.3	6.5