

SILICON CARBIDE SCHOTTKY DIODE

Voltage

650 V

Current

4 A

Features

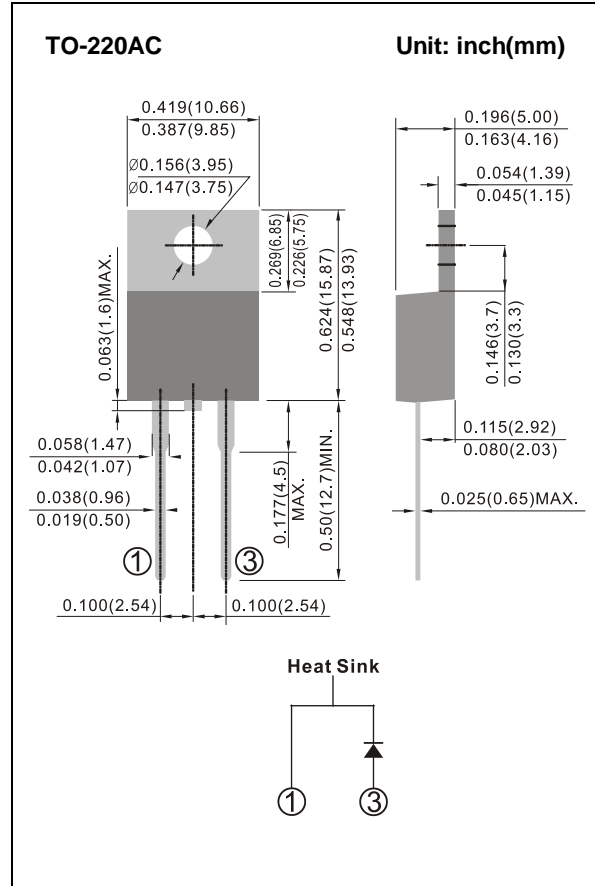
- Temperature Independent Switching Behavior
 - Low Conduction and Switching Loss
 - High Surge Current Capability
 - Positive Temperature Coefficient on V_F
 - Fast Reverse Recovery
- AEC-Q101 qualified

Mechanical Data

- Case: Molded plastic, TO-220AC
- Marking: 04A650F

Benefits

- High Frequency Operation
- Higher System Efficiency
- Environmental Protection
- Parallel Device Convenience
- Hard Switching & High Reliability
- High Temperature Application



Maximum Ratings

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNITS
Maximum Repetitive Peak Reverse Voltage	V_{RRM}	$T_J=25^{\circ}\text{C}$	650	V
Maximum RMS Voltage	V_{RSM}	$T_J=25^{\circ}\text{C}$	650	V
Maximum DC Blocking Voltage	V_R	$T_J=25^{\circ}\text{C}$	650	V
Continuous Forward Current	$I_{F(AV)}$	$T_C=25^{\circ}\text{C}$	11	A
		$T_C=125^{\circ}\text{C}$	6	A
		$T_C=150^{\circ}\text{C}$	4	A
Repetitive Peak Forward Surge Current ($T_P=10\text{ms}$, Half Sine Wave, $D=0.1$)	I_{FRM}	$T_C=25^{\circ}\text{C}$	26	A
		$T_C=125^{\circ}\text{C}$	23	A



SiCSK4A650F

Maximum Ratings

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNITS
Non-Repetitive Peak Forward Surge Current ($T_P=10\text{mS}$, Half Sine Wave)	I_{FSM}	$T_C=25^\circ\text{C}$	29	A
		$T_C=125^\circ\text{C}$	24	A
Non-Repetitive Peak Forward Surge Current ($T_P=10\mu\text{S}$, Pulse)		$T_C=25^\circ\text{C}$	127	A
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	75	W
		$T_C=125^\circ\text{C}$	25	W
Operating Junction Temperature	T_J		175	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55 to 175	$^\circ\text{C}$
Thermal Resistance Junction to Case	$R_{\theta JC}$		2	$^\circ\text{C/W}$

Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
DC Blanking Voltage	V_{DC}	$I_R=100\mu\text{A}$, $T_J=25^\circ\text{C}$	650	770	-	V
Forward Voltage	V_F	$I_F=4\text{A}$, $T_J=25^\circ\text{C}$	-	1.5	1.8	V
		$I_F=4\text{A}$, $T_J=175^\circ\text{C}$	-	1.9	2.2	V
Reverse Current	I_R	$V_R=650\text{V}$, $T_J=25^\circ\text{C}$	-	1	50	μA
		$V_R=650\text{V}$, $T_J=175^\circ\text{C}$	-	6	190	μA
Total Capacitive Charge	Q_C	$I_F=4\text{A}$, $di/dt=300\text{A}/\mu\text{S}$, $V_R=400\text{V}$, $T_J=25^\circ\text{C}$	-	11	-	nC
Total Capacitance	C	$V_R=1\text{V}$, $T_J=25^\circ\text{C}$, $f=1\text{MHz}$	-	155	-	pF
		$V_R=200\text{V}$, $T_J=25^\circ\text{C}$, $f=1\text{MHz}$	-	25	-	pF
		$V_R=400\text{V}$, $T_J=25^\circ\text{C}$, $f=1\text{MHz}$	-	25	-	pF

TYPICAL CHARACTERISTIC CURVES

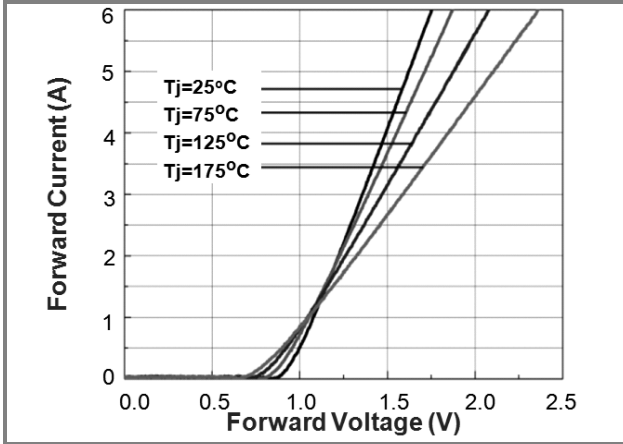


Fig.1 Forward Characteristics

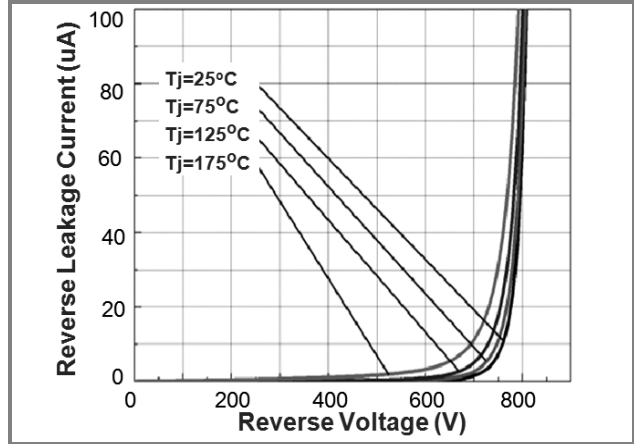


Fig.2 Reverse Characteristics

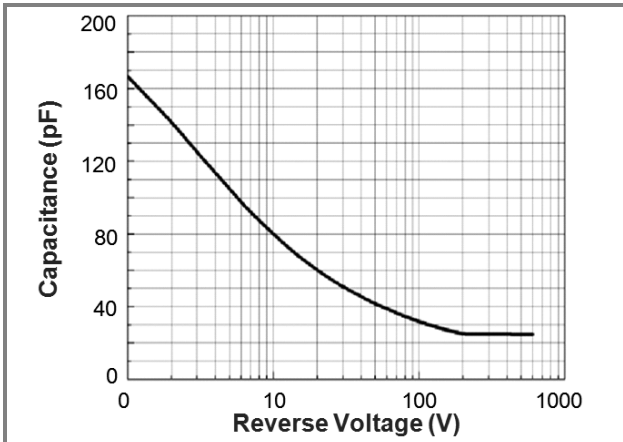


Fig.3 Capacitance vs. Reverse Voltage

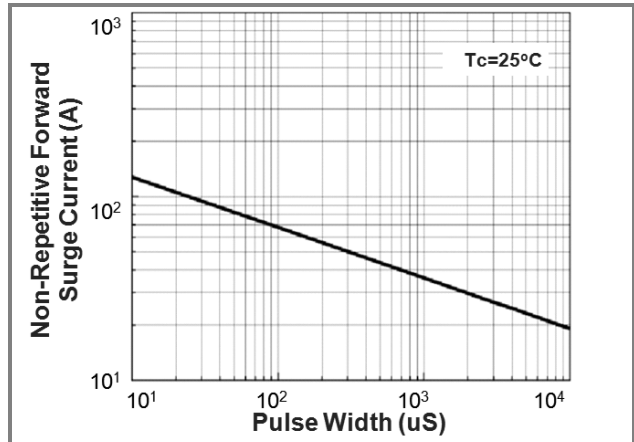


Fig.4 Non-Repetitive Peak Forward Surge Current (Pulse Mode)

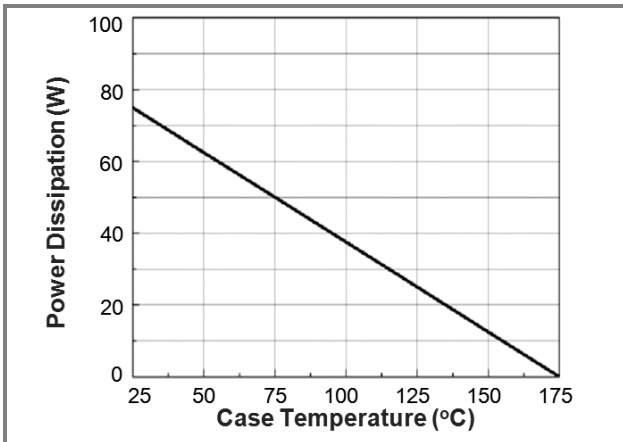


Fig.5 Power Derating

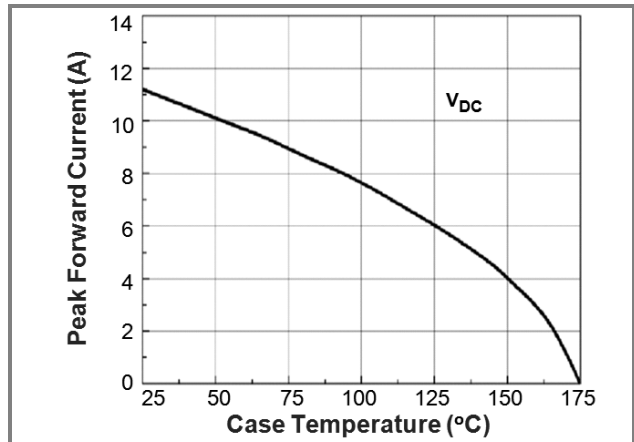


Fig.6 Current Derating