RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

SC3S06508A

650V/8A Silicon Carbide Power Schottky Barrier Diode

Features

- Rated to 650V at 8 Amps
- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

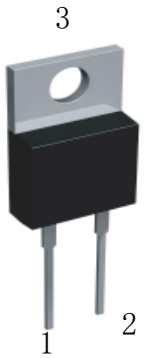
Key Characteristics		
V_{RRM}	650	V
$I_{F,}$ $T_c \leqslant 135℃$	11	A
Q_C	30	nC

Benefits

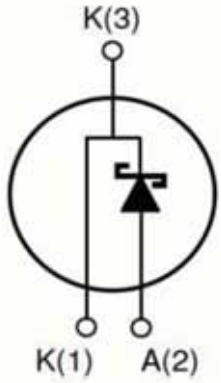
- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

Applications

- SMPS, e.g., CCM PFC;
- Motor drives, Solar application, UPS, Wind turbine, Rail traction, EV/HEV



TO-220



Internal Schematic

Part No.	Package Type	Marking
SC3S06508A	TO-220-2 pin	SC06508

2023-07/26
REV:B

Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}		650	V
Surge Peak Reverse Voltage	V_{RSM}		650	V
DC Blocking Voltage	V_{DC}		650	V
Continuous Forward Current	I_F	T_C=25℃ T_C=135℃ T_C=151℃	25.5 11 8	A
Repetitive Peak Forward Surge Current	I_{FRM}	T_C=25℃, tp=10ms, Half Sine Wave, D=0.3	40	A
Non-repetitive Peak Forward Surge Current	I_{FSM}	T_C=25℃, tp=10ms, Half Sine Wave	80	A
Power Dissipation	P_{TOT}	T_C=25℃	102.4	W
		T_C=110℃	45	W
Operating Junction	T_j		-55℃ to 175℃	℃
Storage Temperature	T_{stg}		-55℃ to 175℃	℃
Mounting Torque		M3 Screw 6-32 Screw	1 8.8	Nm lbf-in

Thermal Characteristics

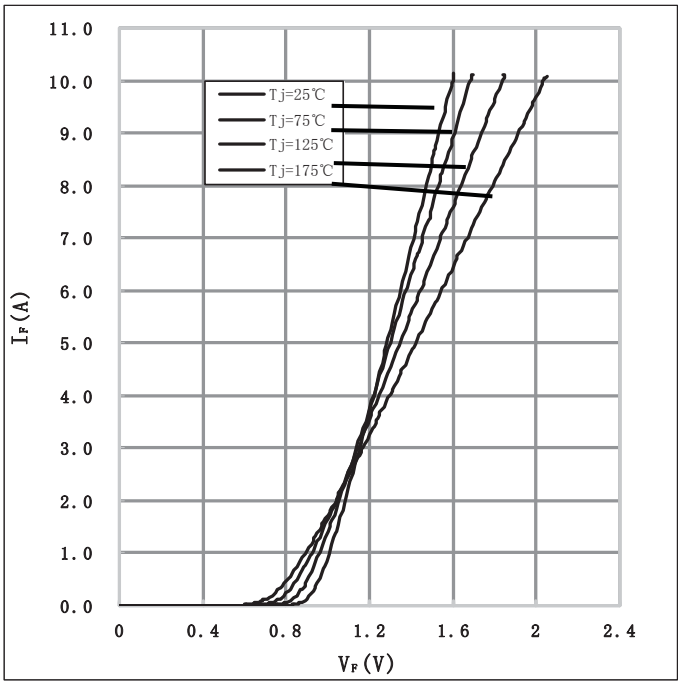
Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	$R_{th\ JC}$		1.465	℃/W

Electrical Characteristics

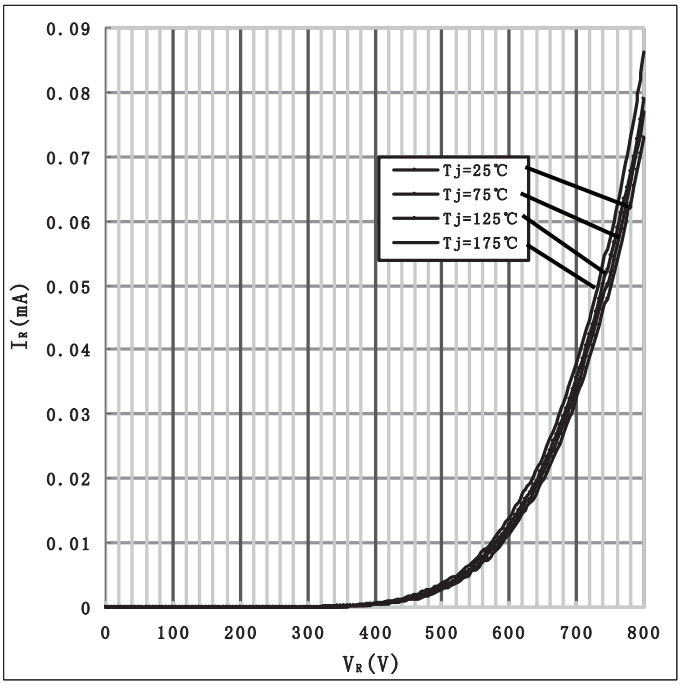
Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	V_F	I_F=8A, T_j=25℃	1.47	1.7	V
		I_F=8A, T_j=175℃	1.78	2.5	
Reverse Current	I_R	V_R=650V, T_j=25℃	10	100	μA
		V_R=650V, T_j=175℃	15	200	
Total Capacitive Charge	Q_C	V_R=400V, T_j=150℃ $Qc = \int_0^{VR} C(V)dV$	30	-	nC
Total Capacitance	C	V_R=0V, T_j=25℃, f=1MHZ	550	588	pF
		V_R=200V, T_j=25℃, f=1MHZ	56.5	57	
		V_R=400V, T_j=25℃, f=1MHZ	54	54.5	

RATING AND CHARACTERISTICS CURVES(SC3S06508A)

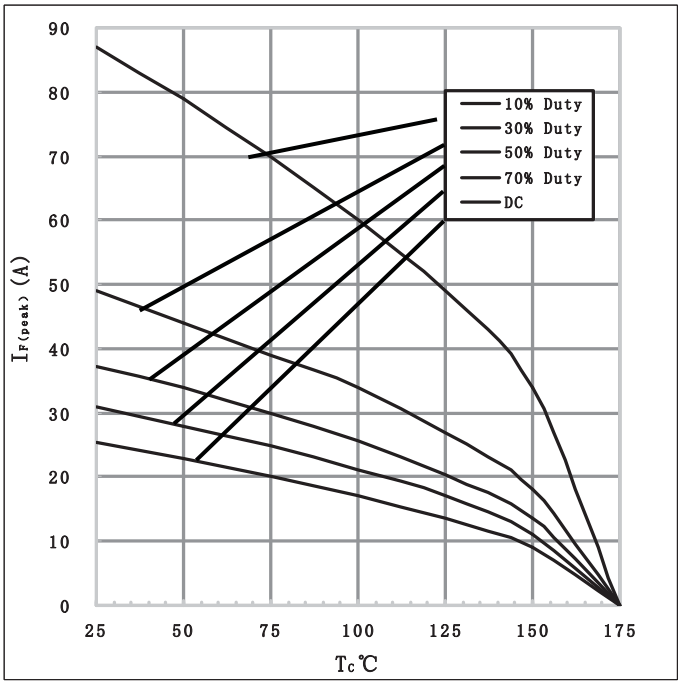
1) Forward IV characteristics as a function of Tj :



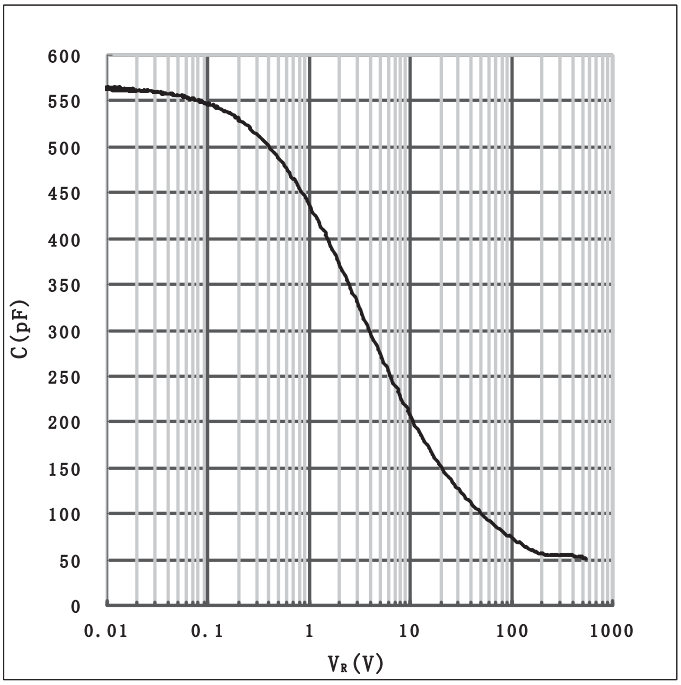
2) Reverse IV characteristics as a function of Tj :



3) Current Derating



4)Capacitance vs. reverse voltage :



Package TO-220

Unit:mm