

## 650V/4A Silicon Carbide Power Schottky Barrier Diode

### Features

- Rated to 650V at 4 Amps
- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

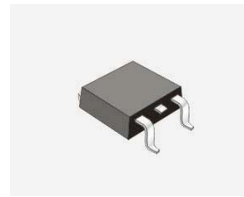
Key Characteristics		
$V_{RRM}$	<b>650</b>	<b>V</b>
$I_F, T_c \leq 135^\circ\text{C}$	<b>5</b>	<b>A</b>
$Q_C$	<b>11</b>	<b>nC</b>

### Benefits

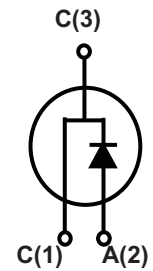
- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

### Applications

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



封装: TO-252



Part No.	Package Type	Marking
SC3S06504C	TO-252	SC06504

## Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$		650	V
Surge Peak Reverse Voltage	$V_{RSM}$		650	
DC Blocking Voltage	$V_{DC}$		650	
Continuous Forward Current	$I_F$	$T_C=25^{\circ}C$	11	A
		$T_C=135^{\circ}C$	5	
		$T_C=150^{\circ}C$	4	
Repetitive Peak Forward Surge Current	$I_{FRM}$	$T_C=25^{\circ}C$ , $t_p=10ms$ , Half Sine Wave, $D=0.3$	15	A
Non-repetitive Peak Forward Surge Current	$I_{FSM}$	$T_C=25^{\circ}C$ , $t_p=10ms$ , Half Sine Wave	30	A
Power Dissipation	$P_{TOT}$	$T_C=25^{\circ}C$	53.2	W
		$T_C=110^{\circ}C$	23	W
Operating Junction	$T_j$		$-55^{\circ}C$ to $175^{\circ}C$	$^{\circ}C$
Storage Temperature	$T_{stg}$		$-55^{\circ}C$ to $175^{\circ}C$	$^{\circ}C$
Mounting Torque		M3 Screw	1	Nm
		6-32 Screw	8.8	lbf-in

## Thermal Characteristics

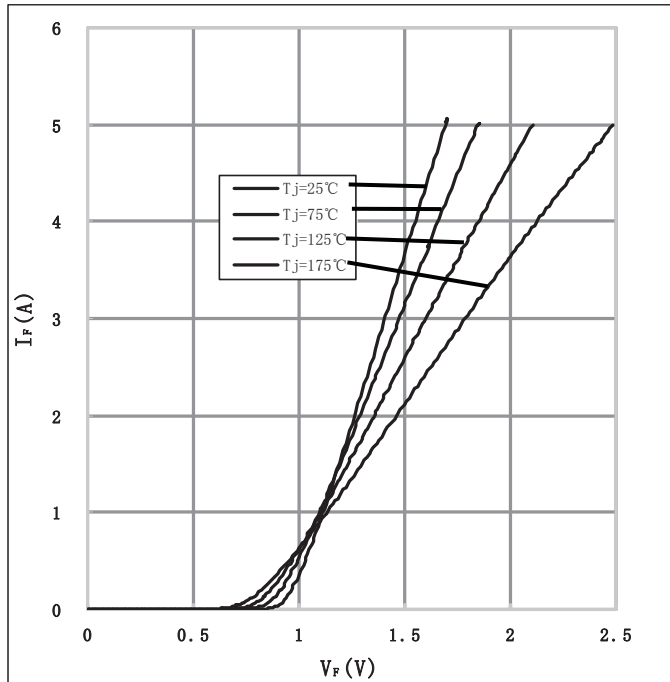
Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	$R_{th\ JC}$		2.82	$^{\circ}C/W$

## Electrical Characteristics

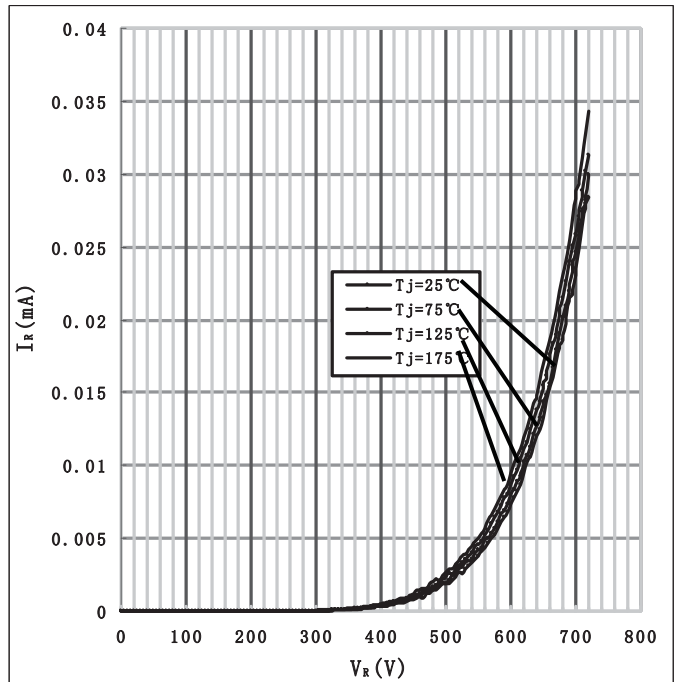
Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	$V_F$	$I_F=4A$ , $T_j=25^{\circ}C$	1.55	1.7	V
		$I_F=4A$ , $T_j=175^{\circ}C$	2.2	2.5	
Reverse Current	$I_R$	$V_R=650V$ , $T_j=25^{\circ}C$	10	100	$\mu A$
		$V_R=650V$ , $T_j=175^{\circ}C$	20	200	
Total Capacitive Charge	$Q_C$	$V_R=400V$ , $T_j=150^{\circ}C$ $Q_C = \int_b^{VR} C(V)dV$	11	-	nC
Total Capacitance	C	$V_R=0V$ , $T_j=25^{\circ}C$ , $f=1MHz$	181	220	pF
		$V_R=200V$ , $T_j=25^{\circ}C$ , $f=1MHz$	22.5	25	
		$V_R=400V$ , $T_j=25^{\circ}C$ , $f=1MHz$	20.5	21	

# RATING AND CHARACTERISTICS CURVES (SC3S06504C)

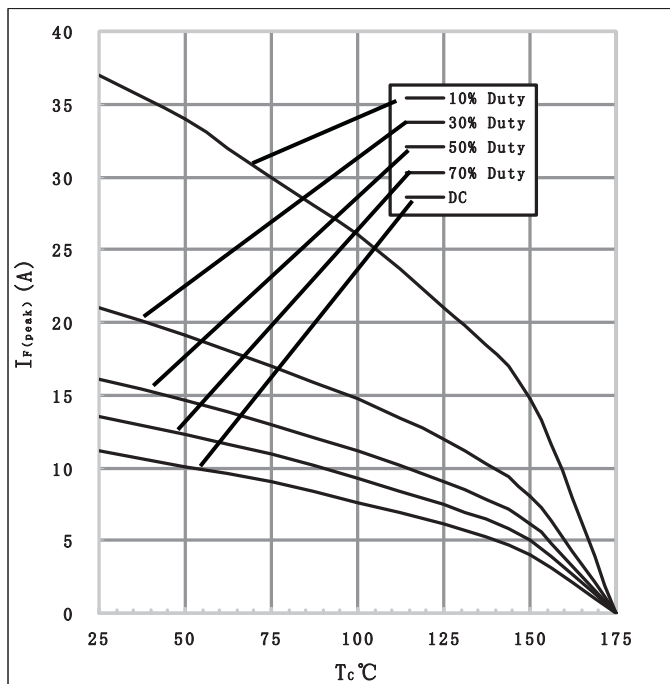
1) Forward IV characteristics as a function of  $T_j$  :



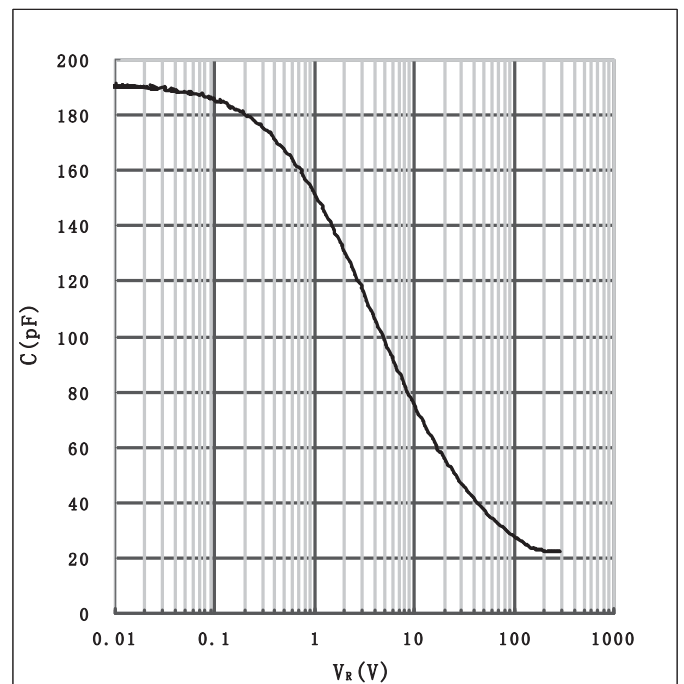
2) Reverse IV characteristics as a function of  $T_j$  :



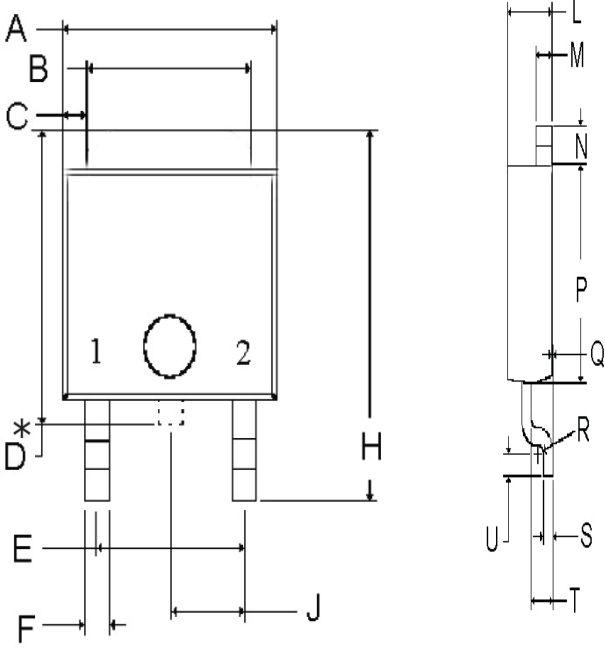
3) Current Derating



4) Capacitance vs. reverse voltage :



**Package TO-252**



DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.477	6.731	0.255	0.265
B	5.004	5.207	0.197	0.205
C	0.686	0.838	0.027	0.033
D*	6.858	8.179	0.270	0.322
E	4.521	4.623	0.178	0.182
F	0.635	0.889	0.025	0.035
H	9.703	10.084	0.382	0.397
J	2.286		0.090	
L	2.184	2.388	0.086	0.094
M	0.762	0.864	0.030	0.034
N	1.016	1.118	0.040	0.044
P	5.969	6.223	0.235	0.245
Q	0.000	0.102	0.000	0.004
R	R0.31		R0.01	
S	0.428	0.588	0.017	0.023
T	1.016	1.118	0.040	0.044
U	0.534	1.118	0.021	0.027



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