

## 650V/5A Silicon Carbide Power Schottky Barrier Diode

### Features

- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

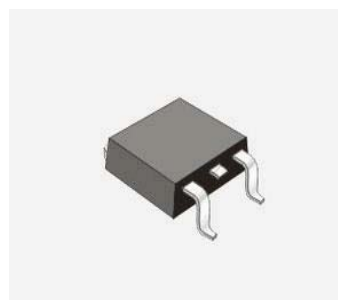
Key Characteristics		
$V_{RRM}$	<b>650</b>	<b>V</b>
$I_F, T_c \leq 135^\circ\text{C}$	<b>10</b>	<b>A</b>
$Q_c$	<b>23</b>	<b>nC</b>

### Benefits

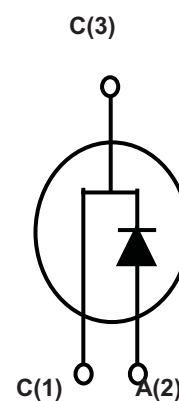
- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

### Applications

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



Package: TO-252



Part No.	Package Type	Marking
SC3S06505C	TO-252	06505

## 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	$I_F$	$T_C=25^{\circ}C$ $T_C=135^{\circ}C$ $T_C=160^{\circ}C$	21.5 10 5	A
Repetitive Peak Forward Surge Current	$I_{FRM}$	$T_C=25^{\circ}C$ , $t_p=10ms$ , Half Sine Wave, $D=0.3$	30	A
Non-repetitive Peak Forward Surge Current	$I_{FSM}$	$T_C=25^{\circ}C$ , $t_p=10ms$ , Half Sine Wave	60	A
Power Dissipation	$P_{TOT}$	$T_C=25^{\circ}C$	85.8	W
		$T_C=110^{\circ}C$	37.2	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 6-32 Screw		Nm lbf-in

## Thermal Characteristics

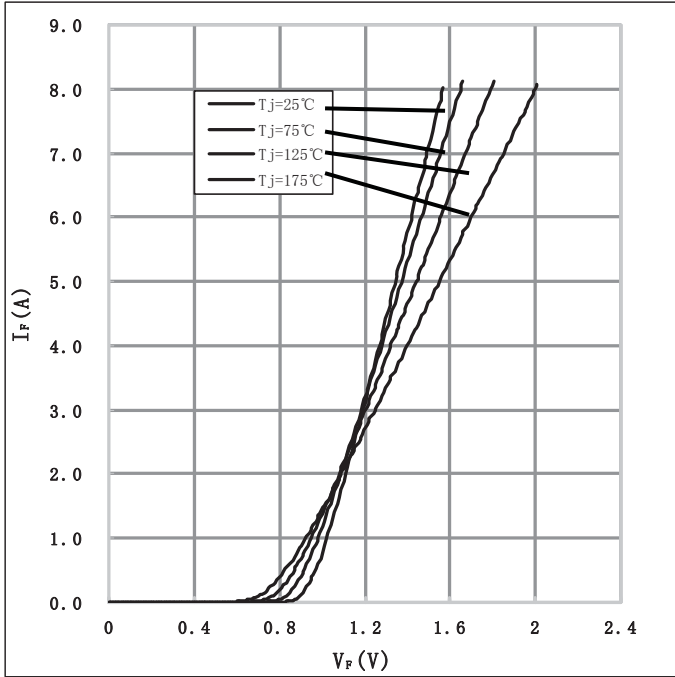
Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	$R_{th\ JC}$		1.748	$^{\circ}C/W$

## Electrical Characteristics

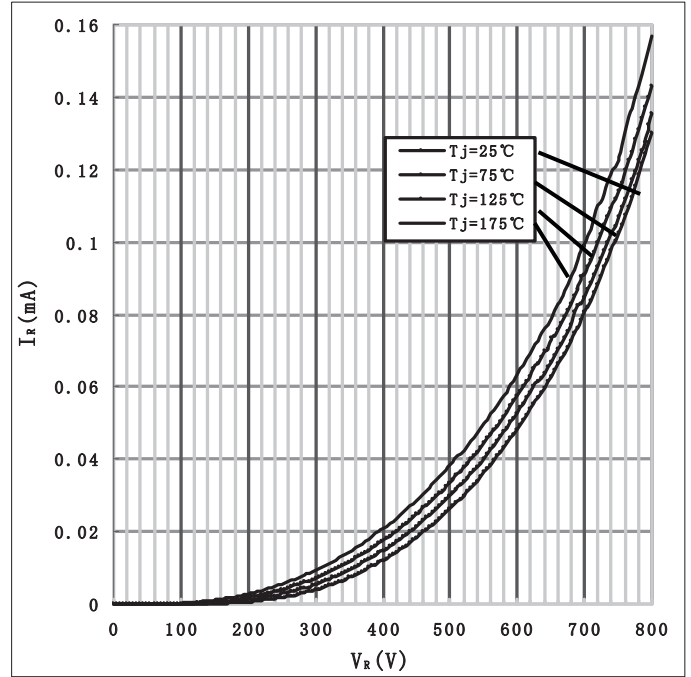
Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	$V_F$	$I_F=5A$ , $T_j=25^{\circ}C$	1.35	1.7	V
		$I_F=5A$ , $T_j=175^{\circ}C$	1.55	2.5	
Reverse Current	$I_R$	$V_R=650V$ , $T_j=25^{\circ}C$	10	100	$\mu A$
		$V_R=650V$ , $T_j=175^{\circ}C$	15	200	
Total Capacitive Charge	$Q_C$	$V_R=400V$ , $T_j=150^{\circ}C$ $Q_C = \int_b^{RR} C(V)dV$	23	-	nC
Total Capacitance	C	$V_R=0V$ , $T_j=25^{\circ}C$ , $f=1MHz$	424	434	pF
		$V_R=200V$ , $T_j=25^{\circ}C$ , $f=1MHz$	44	45	
		$V_R=400V$ , $T_j=25^{\circ}C$ , $f=1MHz$	42.5	43	

## RATING AND CHARACTERISTICS CURVES (SC3S06505C)

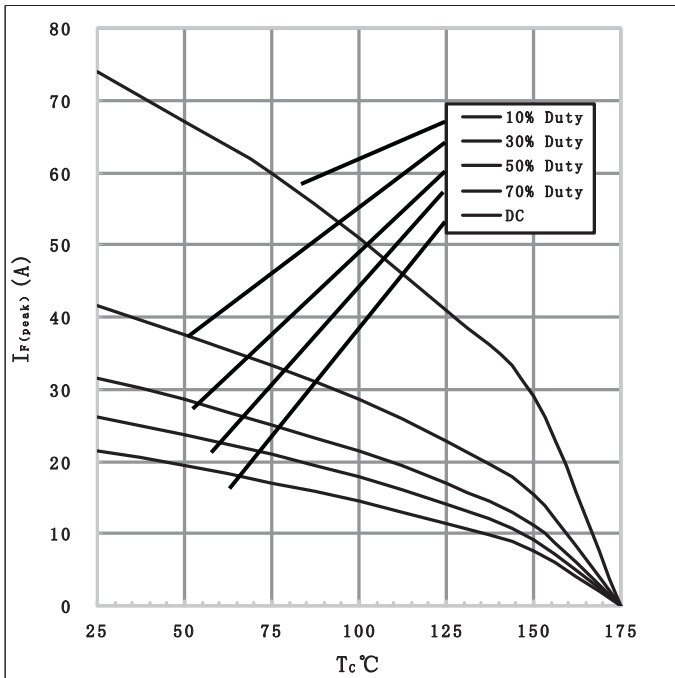
1) Forward IV characteristics as a function of Tj :



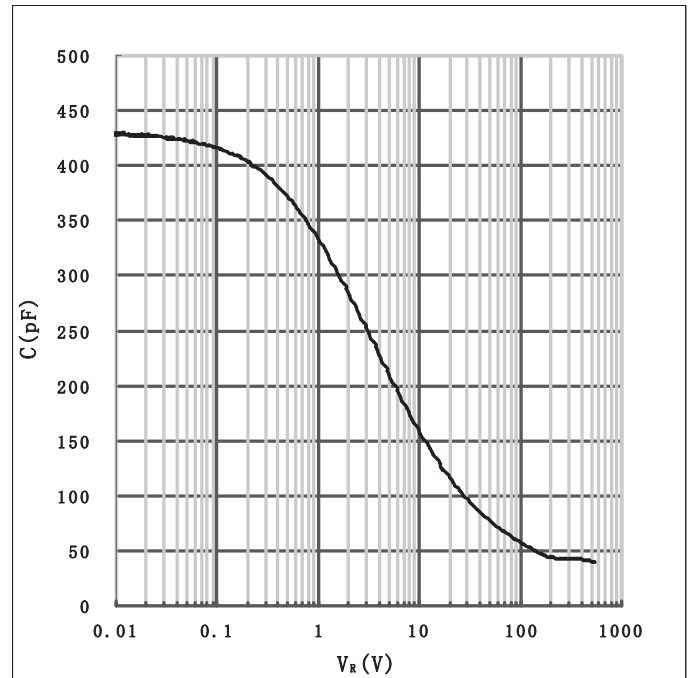
2) Reverse IV characteristics as a function of Tj :



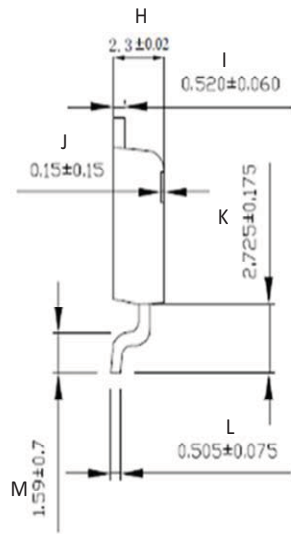
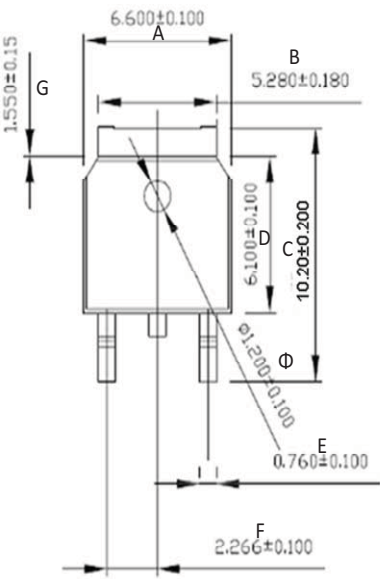
3) Current Derating  
(10%, 30%, 50%, 70%, DC)



4) Capacitance vs. reverse voltage



**Package: TO-252**



DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.5	6.7	0.256	0.264
B	5.1	5.46	0.201	0.215
C	10	10.4	0.394	0.409
D	6	6.2	0.236	0.244
E	7.5	7.7	0.295	0.303
F	2.166	2.366	0.085	0.093
G	1.4	1.6	0.055	0.063
H	2.298	2.302	0.090	0.091
I	0.46	0.58	0.018	0.023
J	0	0.3	0.000	0.012
K	2.55	2.9	0.100	0.114
L	0.43	0.58	0.017	0.023
M	0.89	2.29	0.035	0.090
Φ	1.1	1.3	0.043	0.051

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