

650V/5A Silicon Carbide Power Schottky Barrier Diode

Features

- Rated to 650V at 5 Amps
- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

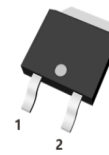
Key Characteristics		
V_{RRM}	650	V
$I_F, T_c \leq 160^\circ\text{C}$	5	A
Q_C	22	nC

Benefits

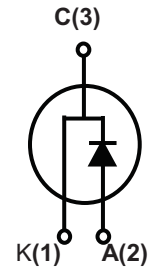
- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

Applications

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



TO-252



Part No.	Package Type	Marking
SC3S06505C	TO-252	SC06505

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	
Continuous Forward Current	I_F	$T_C=25^{\circ}\text{C}$	21.4	A
		$T_C=135^{\circ}\text{C}$	9.9	
Repetitive Peak Forward Surge Current	I_{FRM}	$T_C=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave, $D=0.3$	30	A
Non-repetitive Peak Forward Surge Current	I_{FSM}	$T_C=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	66	A
Power Dissipation	P_{TOT}	$T_C=25^{\circ}\text{C}$	82	W
		$T_C=110^{\circ}\text{C}$	35	W
Operating Junction	T_j		-55°C to 175°C	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-55°C to 175°C	$^{\circ}\text{C}$
Mounting Torque		M3 Screw	1	Nm lbf-in
		6-32 Screw	8.8	

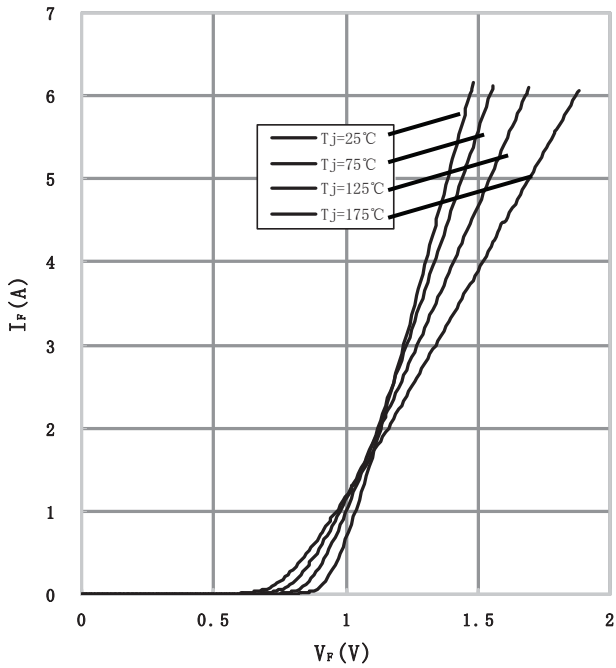
Thermal Characteristics

Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	R_{thJC}		1.84	$^{\circ}\text{C}/\text{W}$

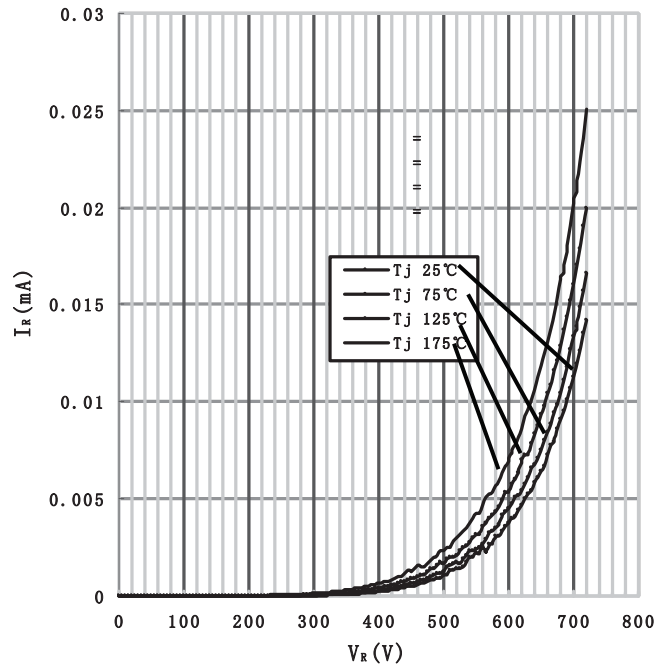
Electrical Characteristics

Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	V_F	$I_F=6\text{A}$, $T_j=25^{\circ}\text{C}$	1.36	1.7	V
		$I_F=6\text{A}$, $T_j=175^{\circ}\text{C}$	1.64	2	
Reverse Current	I_R	$V_R=650\text{V}$, $T_j=25^{\circ}\text{C}$	0.12	50	μA
		$V_R=650\text{V}$, $T_j=175^{\circ}\text{C}$	0.91	100	
Total Capacitive Charge	Q_C	$V_R=400\text{V}$, $T_j=25^{\circ}\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$	22	-	nC
Total Capacitance	C	$V_R=0\text{V}$, $T_j=25^{\circ}\text{C}$, $f=1\text{MHZ}$	440	-	pF
		$V_R=200\text{V}$, $T_j=25^{\circ}\text{C}$, $f=1\text{MHZ}$	42	-	
		$V_R=400\text{V}$, $T_j=25^{\circ}\text{C}$, $f=1\text{MHZ}$	41	-	

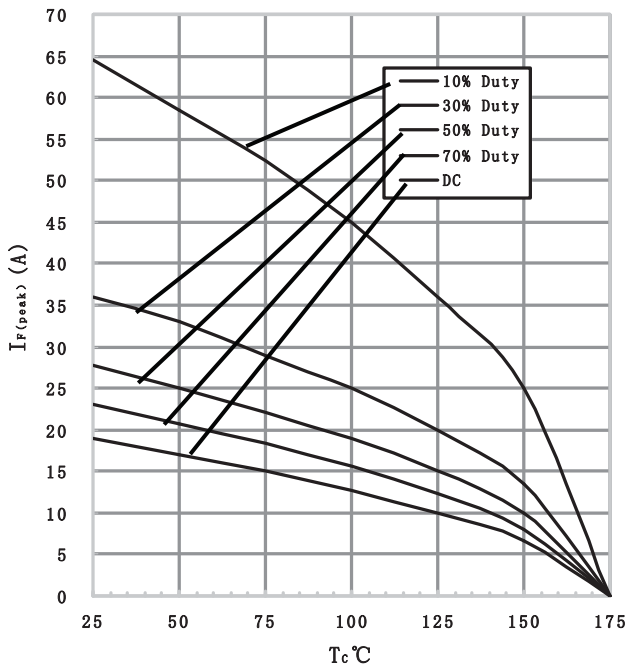
RATING AND CHARACTERISTICS CURVES (SC3S06505C)



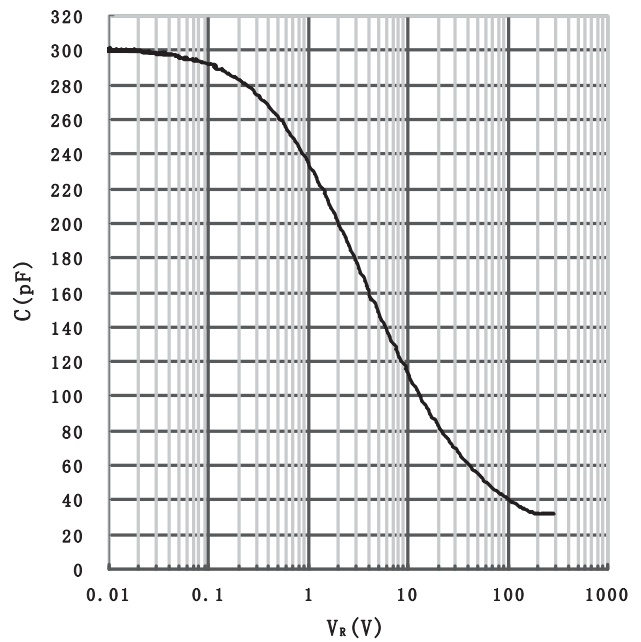
1) Forward IV characteristics as a function of T_j :



2) Reverse IV characteristics as a function of T_j :

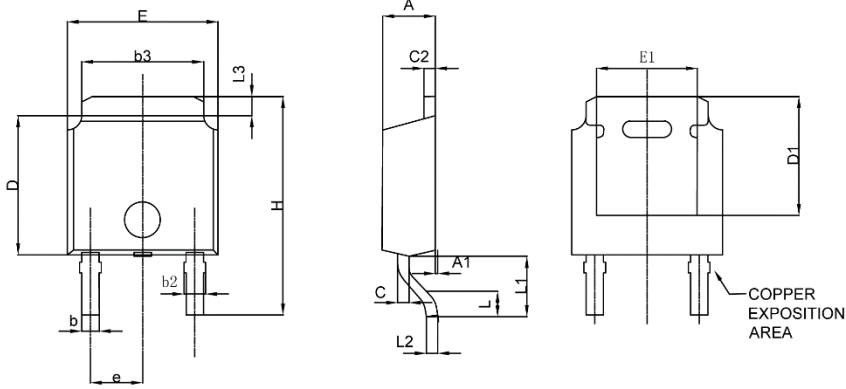


3) Current Derating



4) Capacitance vs. reverse voltage :

Package TO-252



Symbol	DIMENSIONAL REQMTS		
	Min	Nom	Max
E	6.35	6.60	6.73
L	1.40	1.52	1.78
L1	2.743REF		
L2	0.508BSC		
L3	0.89	---	1.27
D	5.97	6.10	6.22
H	9.40	10.00	10.40
b	0.64	0.76	0.89
b2	0.76	0.84	1.14
b3	4.95	5.34	5.46
e	2.286BSC		
A	2.18	2.30	2.39
A1	0.00	---	0.13
c	0.46	0.50	0.61
c2	0.46	0.50	0.60
D1	5.21	---	---
E1	4.32	---	---

Note:
1. All Dimension Are In mm