

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

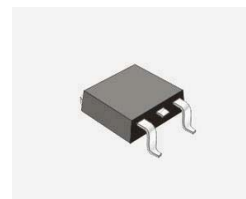
Key Characteristics		
V_{RRM}	650	V
$I_F, T_c \leq 160^\circ\text{C}$	5	A
Q_C	23	nC

Benefits

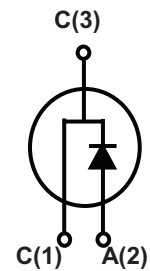
- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

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	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	
Continuous Forward Current	I_F	$T_C=25^{\circ}C$	22.5	A
		$T_C=100^{\circ}C$	15.3	
		$T_C=160^{\circ}C$	5	
Repetitive Peak Forward Surge Current	I_{FRM}	$T_C=25^{\circ}C$, $t_p=10ms$, Half Sine Wave, $D=0.3$	25	A
Non-repetitive Peak Forward Surge Current	I_{FSM}	$T_C=25^{\circ}C$, $t_p=10ms$, Half Sine Wave	78	A
Power Dissipation	P_{TOT}	$T_C=25^{\circ}C$	89	W
		$T_C=110^{\circ}C$	38	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

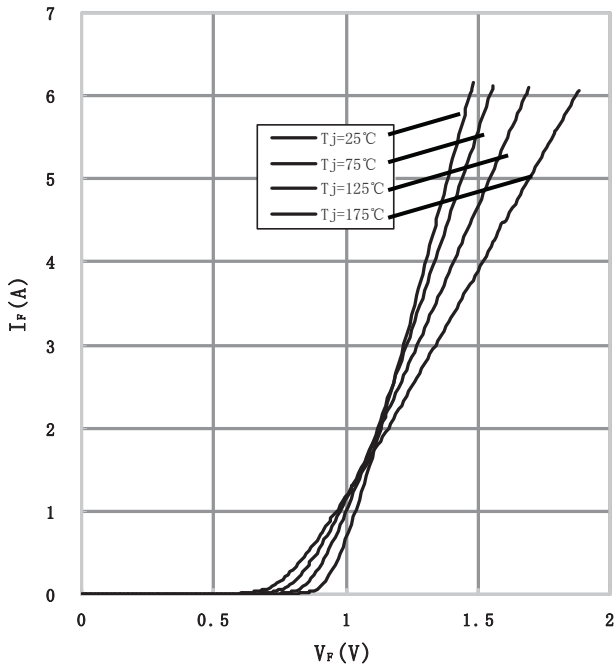
Thermal Characteristics

Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	R_{thJC}		1.69	$^{\circ}C/W$

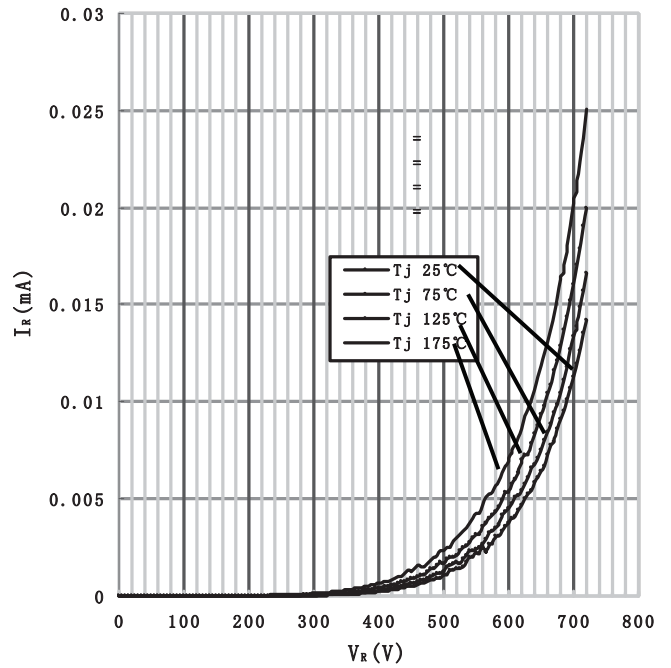
Electrical Characteristics

Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	V_F	$I_F=5A$, $T_j=25^{\circ}C$	1.32	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	50	μA
		$V_R=650V$, $T_j=175^{\circ}C$	20	100	
Total Capacitive Charge	Q_C	$V_R=400V$, $T_j=150^{\circ}C$ $Q_C = \int_0^{V_R} C(V)dV$	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	

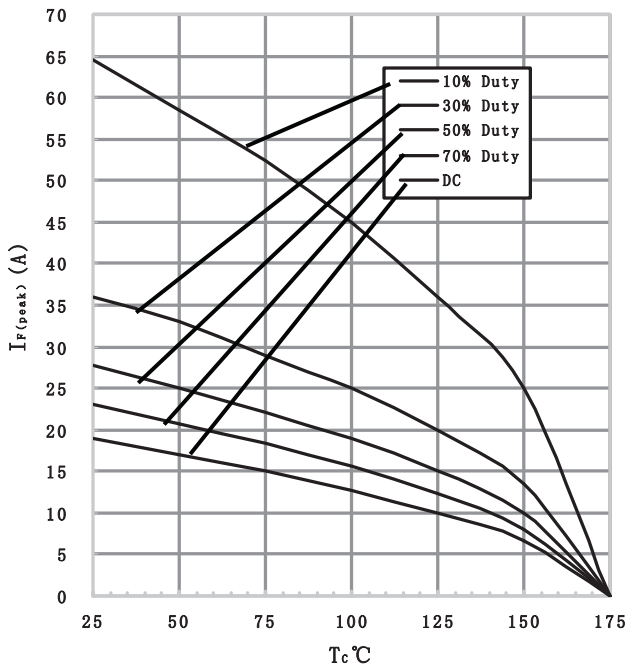
RATING AND CHARACTERISTICS CURVES (SC3S06505C)



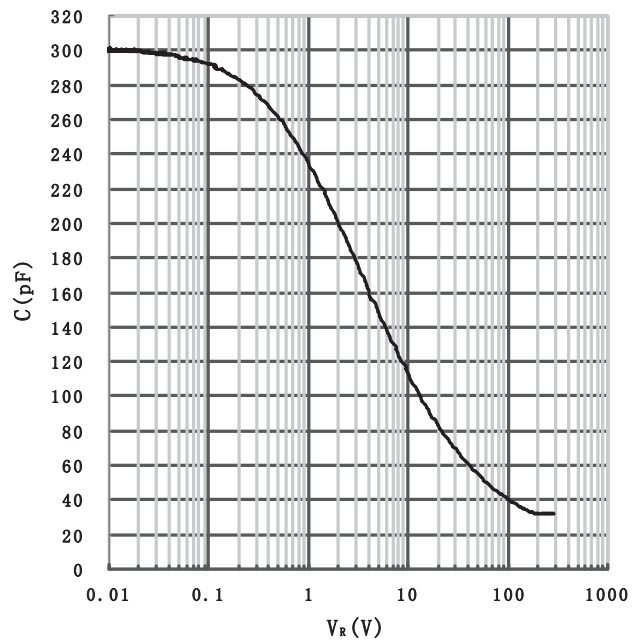
1) Forward IV characteristics as a function of T_j :



2) Reverse IV characteristics as a function of T_j :

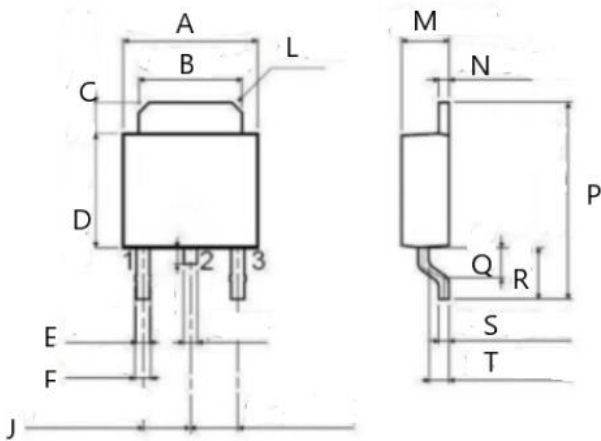


3) Current Derating



4) Capacitance vs. reverse voltage :

Package TO-252



DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.4	6.6	0.251	0.259
B	5.2	5.4	0.204	0.212
C	1.15	1.35	0.045	0.053
D	5.7	6.1	0.224	0.240
E	1.3		0.051	
F	0.75		0.029	
J	2.1	2.5	0.082	0.098
L	0.5		0.019	
M	2.2	2.4	0.086	0.094
N	0.4	0.6	0.015	0.023
P	9.9	10.1	0.389	0.397
Q	1.5		0.059	
R	3.0		0.118	
S	0.4	0.6	0.015	0.023
T	0.9	1.1	0.035	0.043

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