

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

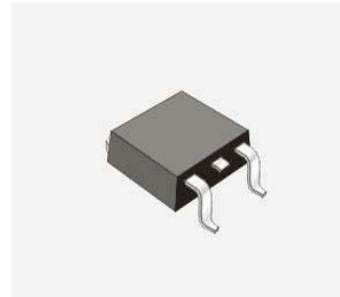
V_{RRM}	650	V
$I_F, T_c \leq 135^\circ\text{C}$	10	A
Q_C	23	nC

Benefits

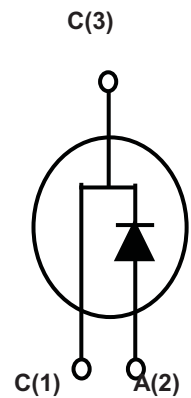
- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

Applications

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



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	$T_C=25^{\circ}\text{C}$ $T_C=135^{\circ}\text{C}$ $T_C=160^{\circ}\text{C}$	21.5 10 5	A
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	60	A
Power Dissipation	P_{TOT}	$T_C=25^{\circ}\text{C}$	85.8	W
		$T_C=110^{\circ}\text{C}$	37.2	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 6-32 Screw		Nm lbf-in

Thermal Characteristics

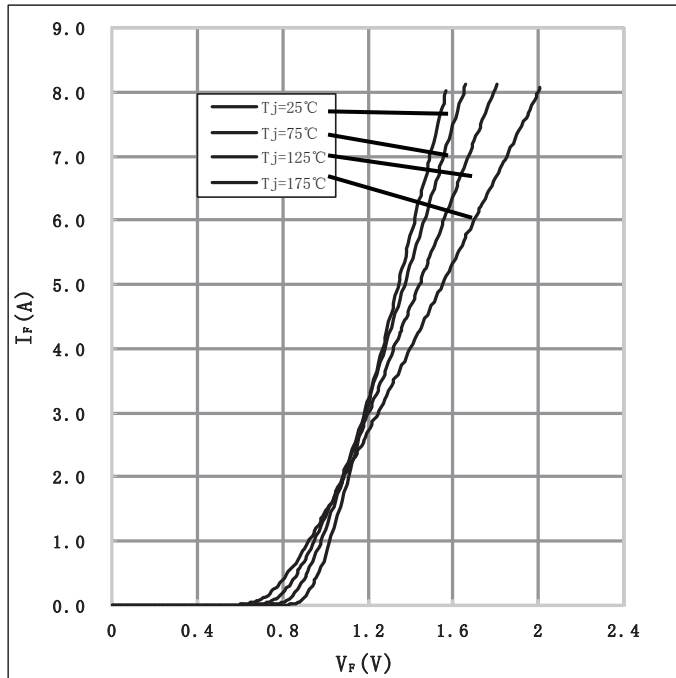
Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	$R_{th\text{ JC}}$		1.748	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

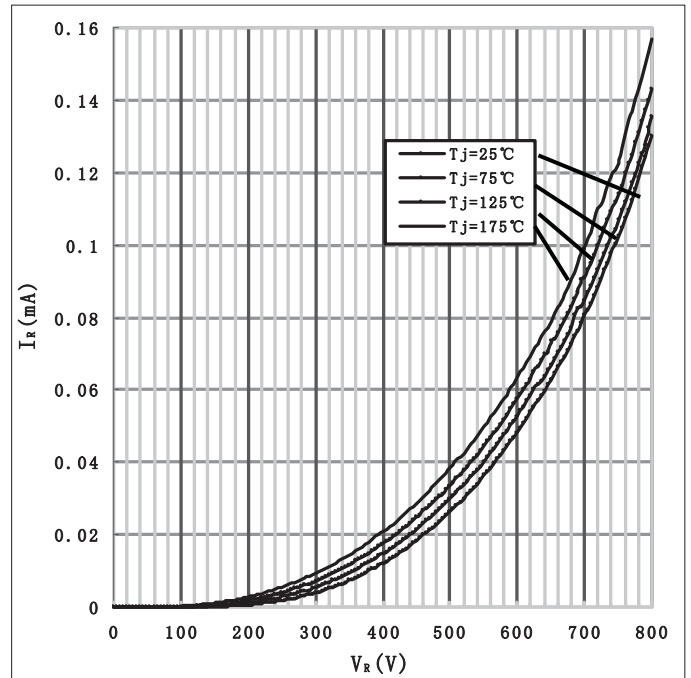
Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	V_F	$I_F=5\text{A}$, $T_j=25^{\circ}\text{C}$	1.35	1.7	V
		$I_F=5\text{A}$, $T_j=175^{\circ}\text{C}$	1.55	2.5	
Reverse Current	I_R	$V_R=650\text{V}$, $T_j=25^{\circ}\text{C}$	10	100	μA
		$V_R=650\text{V}$, $T_j=175^{\circ}\text{C}$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

RATING AND CHARACTERISTICS CURVES (SC3S06505C)

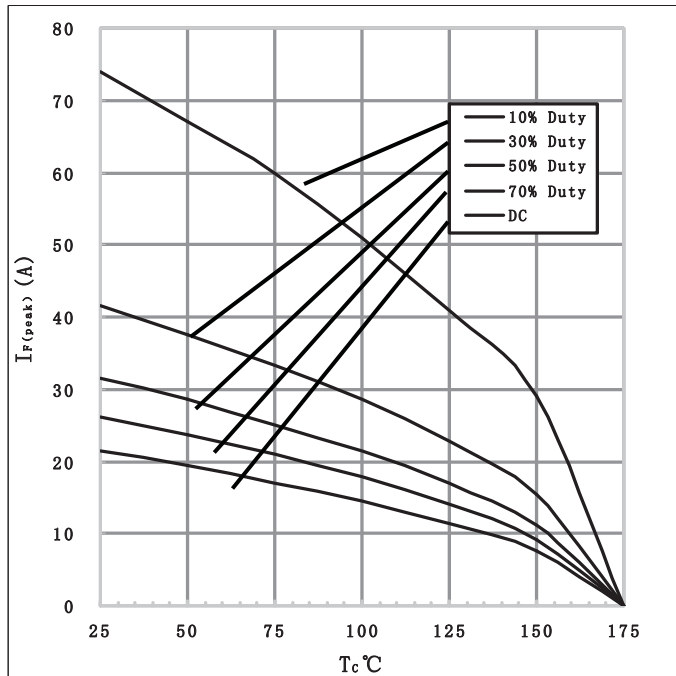
1) Forward IV characteristics as a function of T_j :



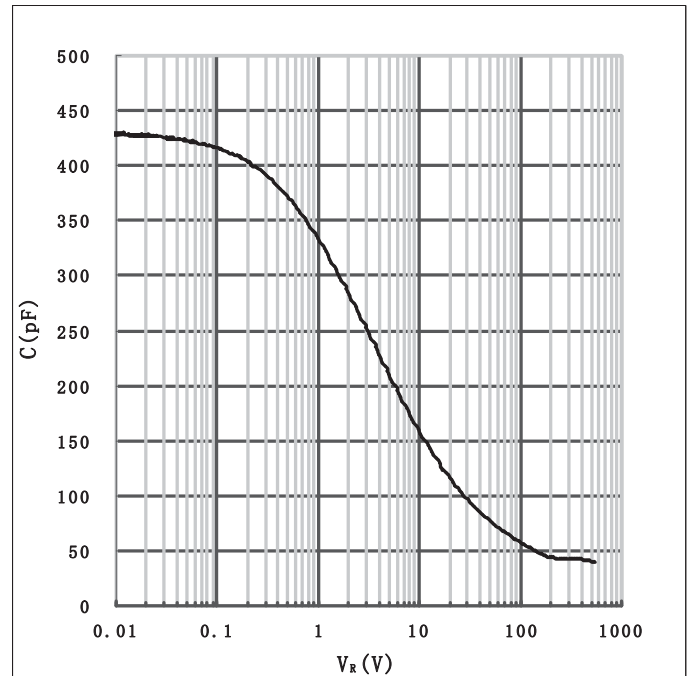
2) Reverse IV characteristics as a function of T_j :



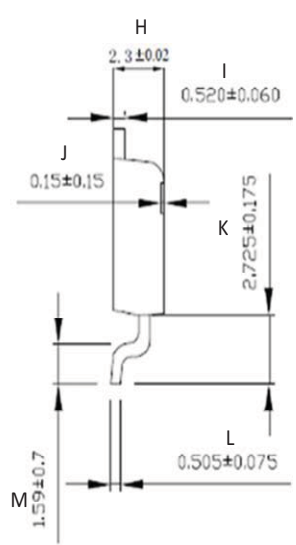
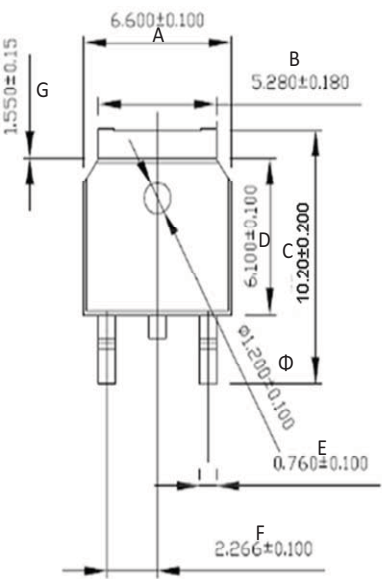
3) Current Derating
(10%, 30%, 50%, 70%, DC)



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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