

1200V/2A 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

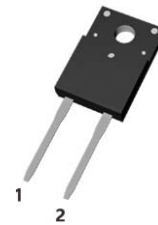
Key Characteristics	
V_{RRM}	1200V
$I_F (T_c = 160.5^\circ\text{C})$	2A
Q_c	12nC

Benefits

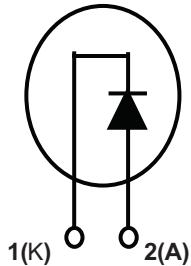
- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

Applications

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



TO-220F



Part No.	Package Type	Marking
SC3S12002F	TO220F	SC12002

Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}		1200	V
Surge Peak Reverse Voltage	V_{RSM}		1200	
Continuous Forward Current	I_F	$T_C=25^{\circ}\text{C}$ $T_C=135^{\circ}\text{C}$ $T_C=160.5^{\circ}\text{C}$	7.9 3.2 2	A
Repetitive Peak Forward Surge Current	I_{FRM}	$T_C=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave, $D=0.3$	10	A
Non-repetitive Peak Forward Surge Current	I_{FSM}	$T_C=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	30	A
Current Squared Time	I^2t		45	A^2s
Power Dissipation	P_{TOT}	$T_C=25^{\circ}\text{C}$	38	W
		$T_C=110^{\circ}\text{C}$	16	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

Thermal Characteristics

Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	R_{thJC}		4	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	V_F	$I_F=2\text{A}$, $T_j=25^{\circ}\text{C}$	1.36	1.7	V
		$I_F=2\text{A}$, $T_j=175^{\circ}\text{C}$	1.78	2.5	
Reverse Current	I_R	$V_R=1200\text{V}$, $T_j=25^{\circ}\text{C}$	1.2	50	μA
		$V_R=1200\text{V}$, $T_j=175^{\circ}\text{C}$	7.6	100	
Total Capacitive Charge	Q_C	$V_R=800\text{V}$, $T_j=25^{\circ}\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$	12	-	nC
Total Capacitance	C	$V_R=0\text{V}$, $T_j=25^{\circ}\text{C}$, $f=1\text{MHZ}$	177		pF
		$V_R=400\text{V}$, $T_j=25^{\circ}\text{C}$, $f=1\text{MHZ}$	12		
		$V_R=800\text{V}$, $T_j=25^{\circ}\text{C}$, $f=1\text{MHZ}$	10		

Typical Performance

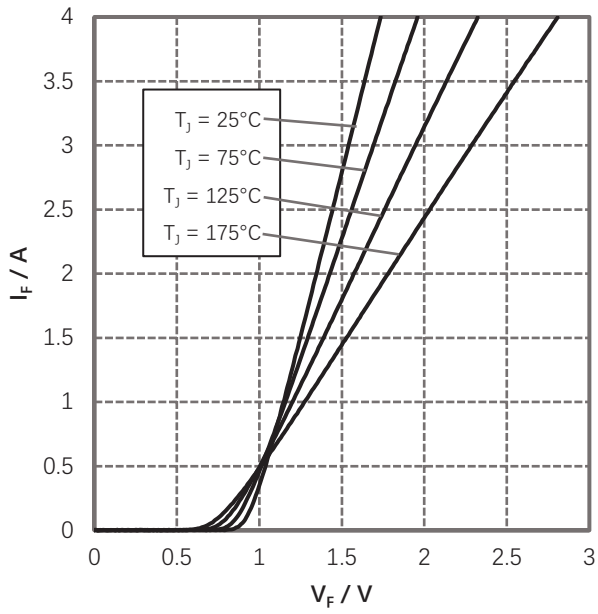


Figure 1. Forward Characteristics

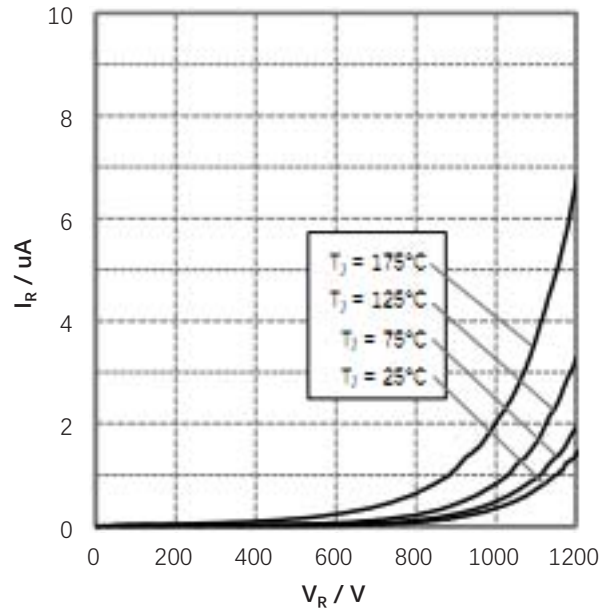


Figure 2. Reverse Characteristics

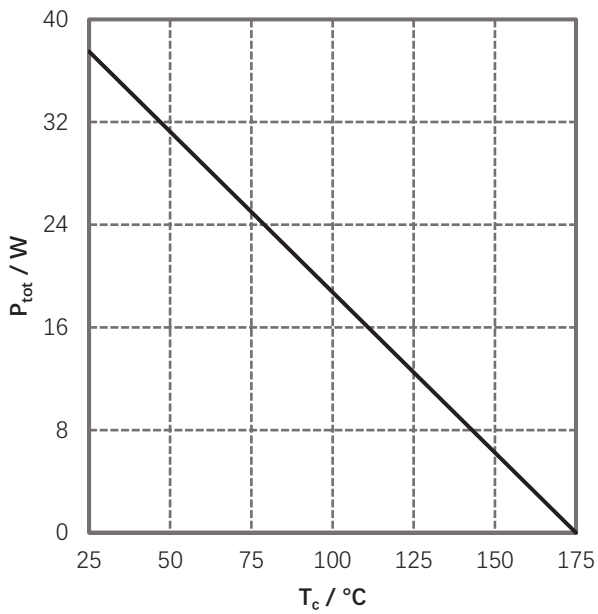


Figure 3. Power Derating

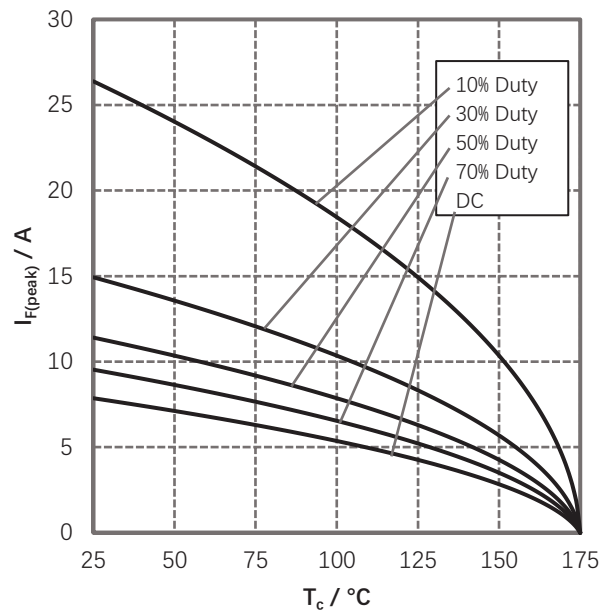


Figure 4. Current Derating

Typical Performance

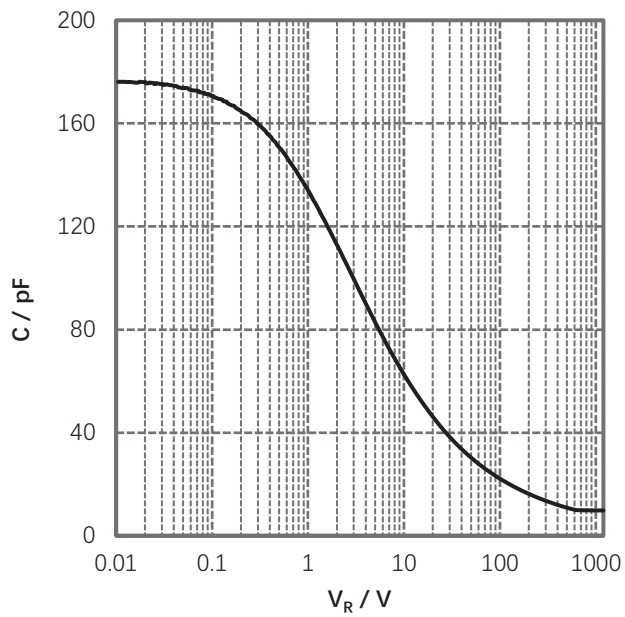


Figure 5. Capacitance - Reverse Voltage

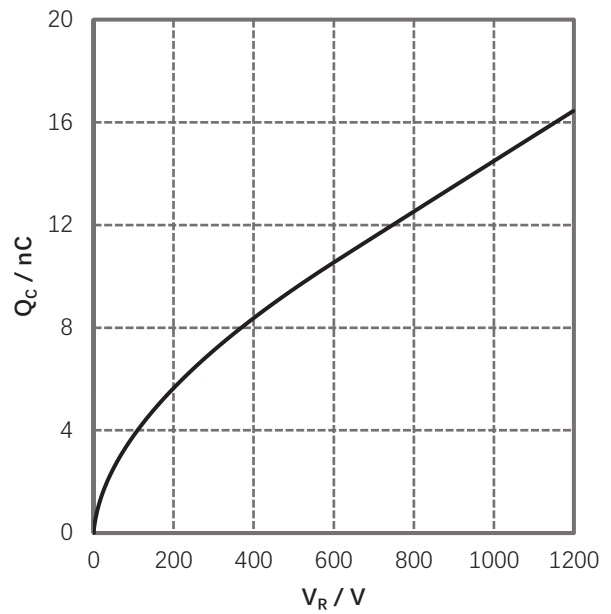


Figure 6 Reverse Charge - Reverse Voltage

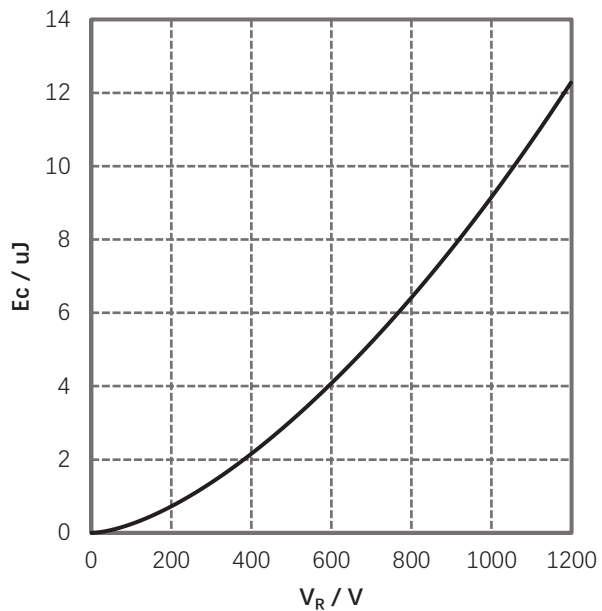


Figure 7. Capacitor Stores Energy

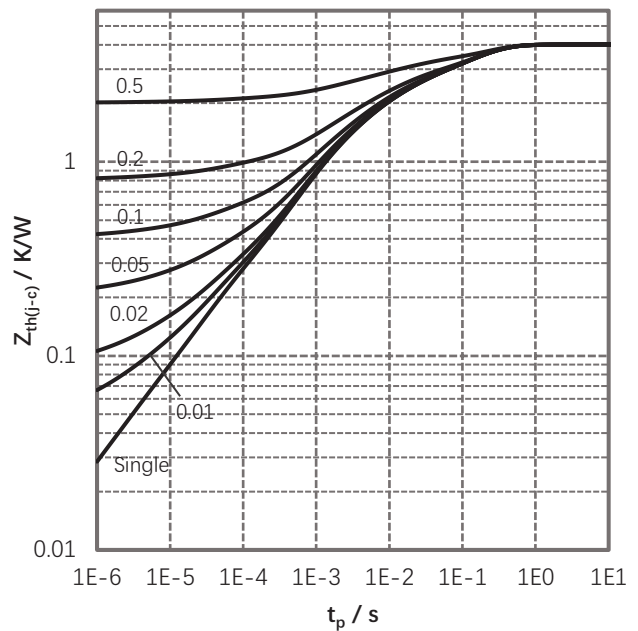
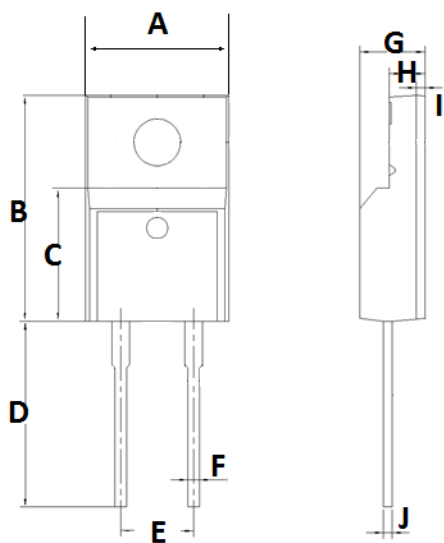


Figure 8. Transient Thermal Impedance

Package TO-220F



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	9.90	10.10	10.30
B	15.80	16.00	16.20
C	9.10	9.30	9.50
D	12.90	13.20	13.50
E	4.70	5.00	5.30
F	0.60	0.80	1.00
G	4.55	4.75	4.95
H	2.40	2.60	2.80
I	0.40	0.60	0.80
J	0.42	0.50	0.58

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