

650V/20A Silicon Carbide Power Schottky Barrier Diode

Features

- Rated to 650V at 20 Amps
- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

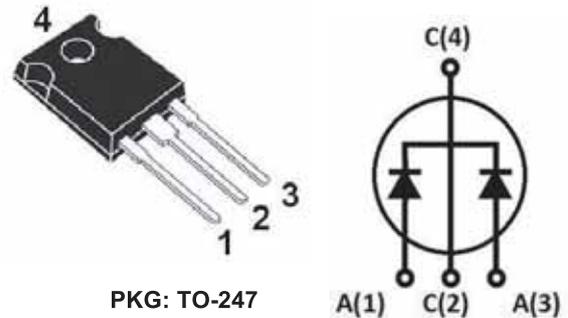
Key Characteristics		
V_{RRM}	650	V
$I_F, T_c \leq 135^\circ\text{C}$	15 (per leg)	A
Q_c	72	nC

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



Part No.	Package Type	Marking
SC3S06520B	TO-247-3 pin	SC06520

Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}		650	V
Surge Peak Reverse Voltage	V_{RSM}		650	
DC Blocking Voltage	V_{DC}		650	
Continuous Forward Current	I_F	$T_C=25^{\circ}C$ $T_C=135^{\circ}C$ $T_C=155^{\circ}C$	33* 15* 10*	A
Repetitive Peak Forward Surge Current	I_{FRM}	$T_C=25^{\circ}C$, $tp=10ms$, Half Sine Wave, $D=0.3$	50*	A
Non-repetitive Peak Forward Surge Current	I_{FSM}	$T_C=25^{\circ}C$, $tp=10ms$, Half Sine Wave	100*	A
Power Dissipation	P_{TOT}	$T_C=25^{\circ}C$	109*	W
		$T_C=110^{\circ}C$	48*	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

* Per leg ; ** Per diode

Thermal Characteristics

Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	R_{thJC}		1.37* 0.69**	$^{\circ}C/W$

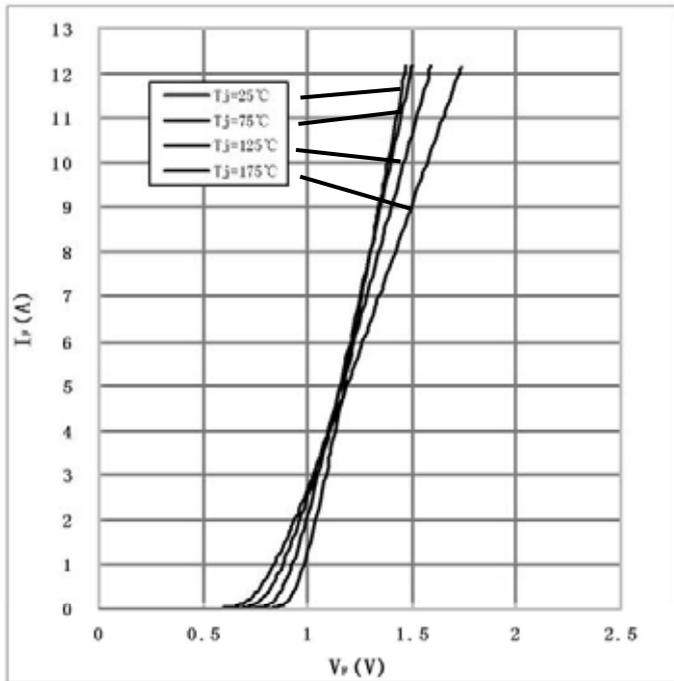
* Per leg ; ** Per diode

Electrical Characteristics

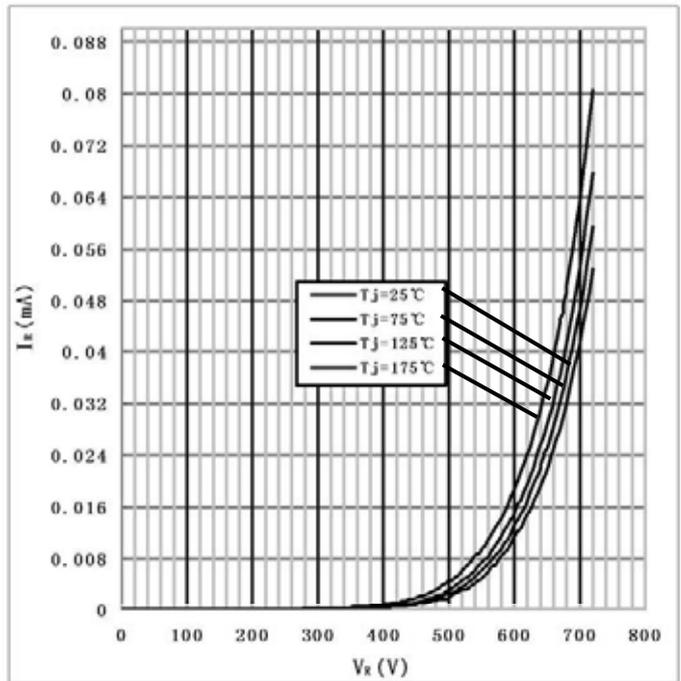
Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	V_F	$I_F=10A$, $T_j=25^{\circ}C$	1.5	1.7	V
		$I_F=10A$, $T_j=175^{\circ}C$	1.7	2.5	
Reverse Current	I_R	$V_R=650V$, $T_j=25^{\circ}C$	20	100	μA
		$V_R=650V$, $T_j=175^{\circ}C$	30	200	
Total Capacitive Charge	Q_C	$V_R=400V$, $T_j=150^{\circ}C$ $Q_C = \int_0^{V_R} C(V)dV$	36	-	nC
Total Capacitance	C	$V_R=0V$, $T_j=25^{\circ}C$, $f=1MHz$	690	730	pF
		$V_R=200V$, $T_j=25^{\circ}C$, $f=1MHz$	72	75	
		$V_R=400V$, $T_j=25^{\circ}C$, $f=1MHz$	71	74	

RATING AND CHARACTERISTICS CURVES (SC3S06520B)

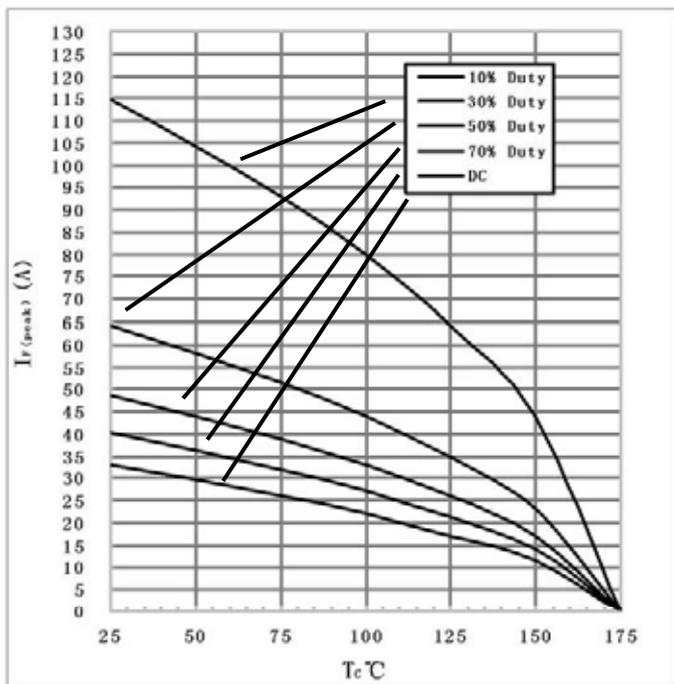
1) Forward IV characteristics as a function of T_j :



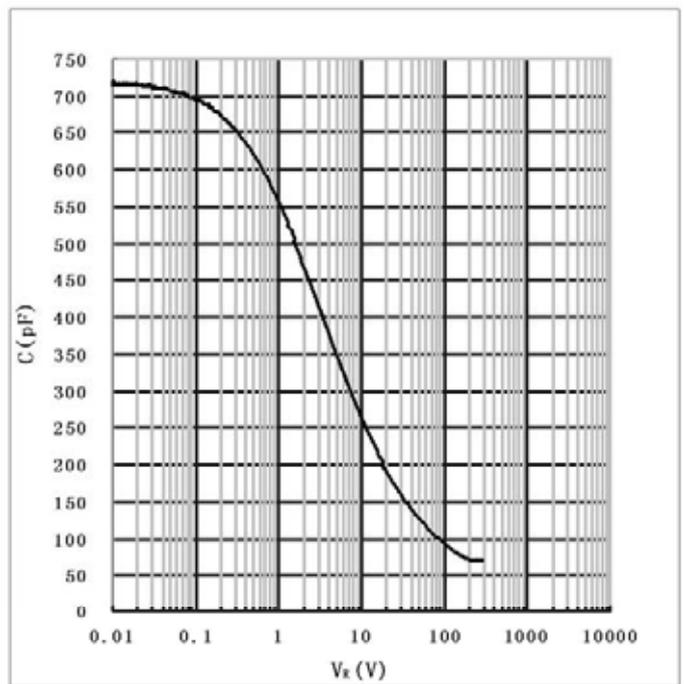
2) Reverse IV characteristics as a function of T_j :



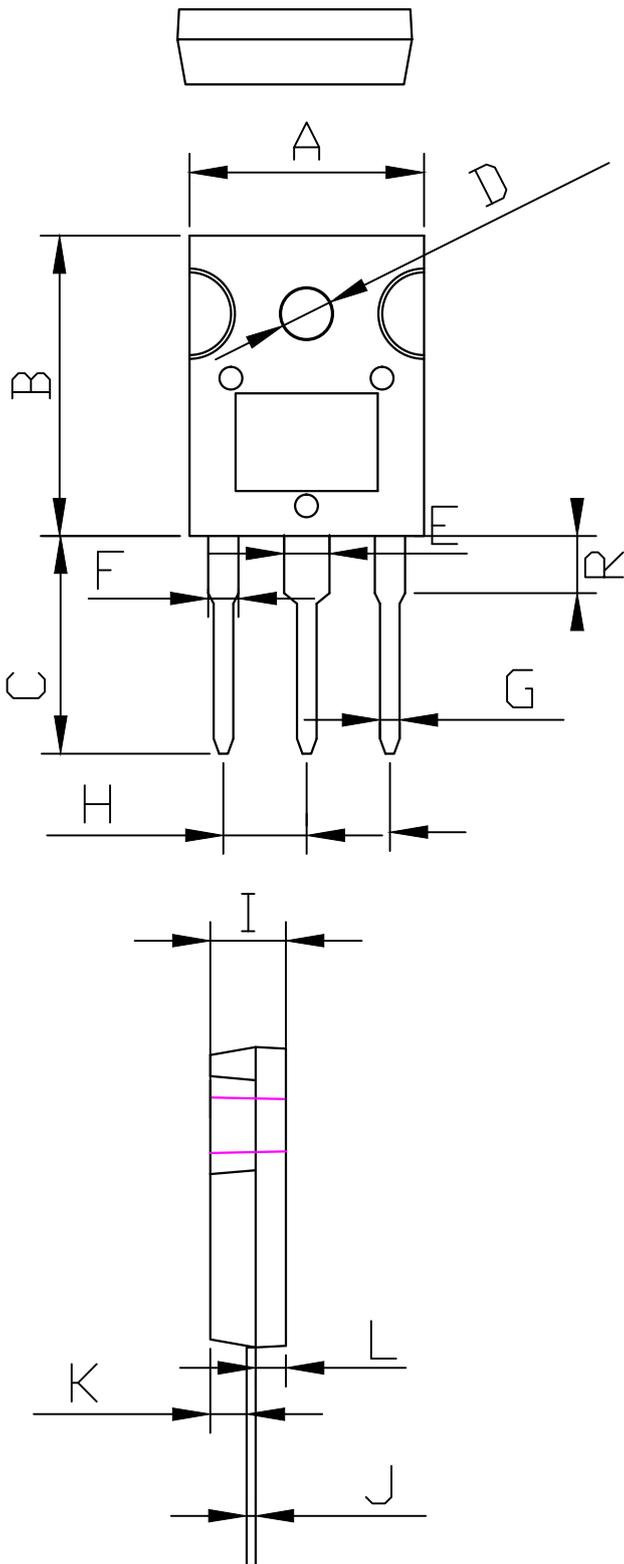
3) Current Derating



4) Capacitance vs. reverse voltage :



TO-247



项目	mm		
	标准值	Min	Max
A	15.5	15.45	15.55
B	20	19.9	20.1
C	14.5	14.4	14.6
D	3.5	3.3	3.6
E	3	2.95	3.05
F	2	1.95	2.05
G	1.3	1.2	1.4
H	5.5	5.4	5.6
I	5	4.95	5.05
J	0.6	0.58	0.62
K	2.4	2.3	2.5
L	2	1.9	2.1
R	3.8	3.6	4