

P3CD08065C

650V/8A SiC Power Schottky Barrier Diode Product



POWERCUBESEMI, INC.

Potential · Convergence · Smart

Features

- Positive temperature coefficient for easy parallel use
- Switching characteristics that are not affected by temperature
- Maximum operating temperature 175 °C
- Zero reverse recovery current
- Zero forward recovery voltage

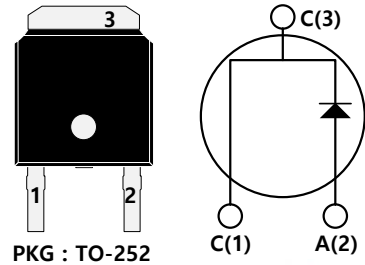
Key Characteristics		
V_{RRM}	650	V
$I_F, T_C \leq 150^\circ\text{C}$	8	A
Q_C	30	nC

Benefits

- Unipolar device
- Greatly reduce switching losses
- No thermal crash in parallel devices
- Reduce system dependence on heat sinks

Applications

- Switch Mode Power Supply (SMPS), Power Factor Correction (PFC)
- Motor drive, photovoltaic inverter, uninterruptible power supply, Wind turbines, train traction systems, electric vehicles.



PKG : TO-252



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Condition	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		650	V
V_{RSM}	Surge Peak Reverse Voltage		650	V
V_{DC}	DC Blocking Voltage		650	V
I_F	Continuous Forward Current	$T_C=25^\circ\text{C}$	25.5	A
		$T_C=135^\circ\text{C}$	11	A
		$T_C=150^\circ\text{C}$	8	A
I_{FRM}	Repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave, $D=0.3$	40	A
I_{FSM}	Non-repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	105	A
P_{TOT}	Power Dissipation	$T_C=25^\circ\text{C}$	102.4	W
		$T_C=110^\circ\text{C}$	45	
T_j	Operating Junction		-55 to 175	$^\circ\text{C}$
T_{stg}	Storage Temperature		-55 to 175	$^\circ\text{C}$



Thermal Characteristics

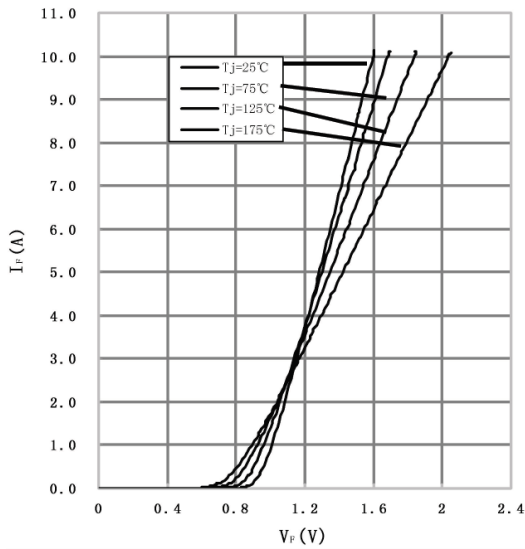
Symbol	Parameter	Test Condition	Value	Unit
			Typ.	
R_{thJc}	Thermal resistance from junction to case		1.465	°C/W

Electrical Characteristics

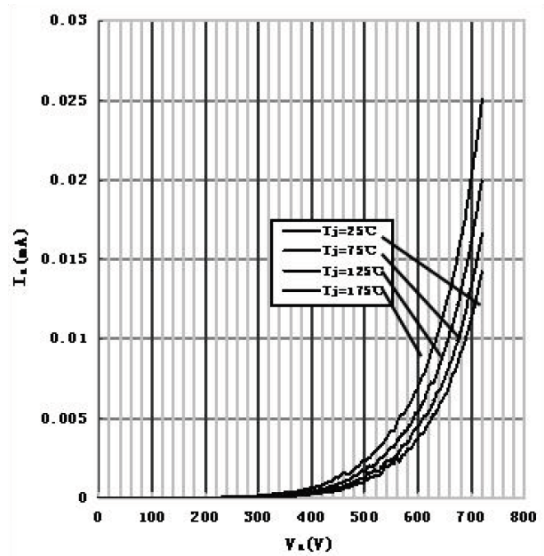
Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
V_F	Forward Voltage	$I_F=8A, T_j=25^{\circ}C$	1.45	1.7	V
		$I_F=8A, T_j=175^{\circ}C$	1.75	2.5	
I_R	Reverse Current	$V_R=650V, T_j=25^{\circ}C$	10	50	μA
		$V_R=650V, T_j=175^{\circ}C$	20	100	
Q_C	Total capacitive Charge	$V_R=400V, T_j=150^{\circ}C$ $Q_C = \int_0^{V_R} C(V)dV$	30	-	nC
C	Total Capacitance	$V_R=0V, T_j=25^{\circ}C, f=1MHZ$	550	588	pF
		$V_R=200V, T_j=25^{\circ}C, f=1MHZ$	56.5	57	
		$V_R=400V, T_j=25^{\circ}C, f=1MHZ$	54	54.5	

Performance Graphs

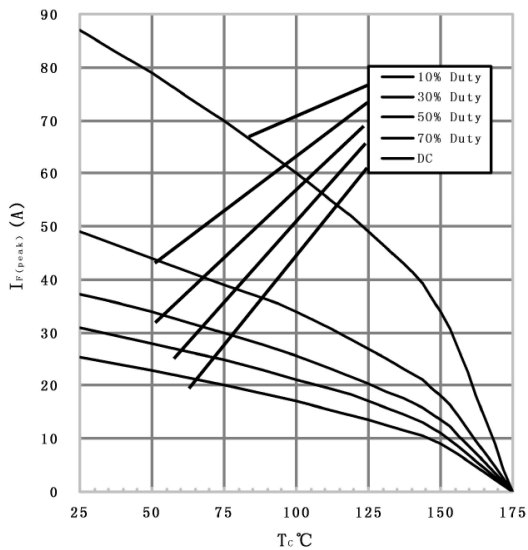
1) Forward IV characteristics as a function of T_j



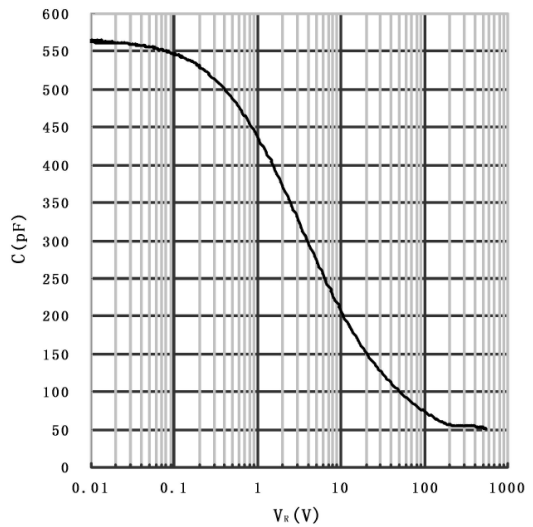
2) Reverse IV characteristics as a function of T_j



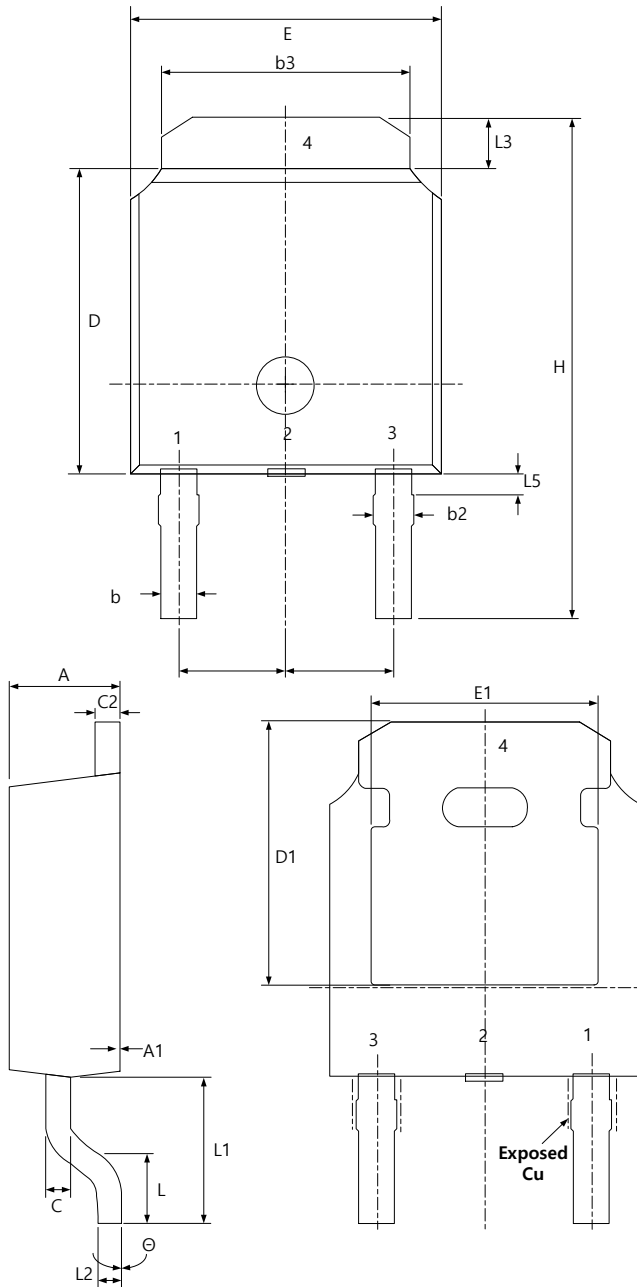
3) Current Derating



4) Capacitance VS. reverse voltage



Package Outline



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
E	6.40	6.60	6.731	
L	1.40	1.52	1.77	
L1	2.743 REF			
L2	0.508 BSC			
L3	0.89	-	1.27	
L5	-	-	-	
D	6.00	6.10	6.223	
H	9.40	10.00	10.40	
b	0.64	0.76	0.88	
b2	0.77	0.84	1.14	
b3	5.21	5.34	5.46	
e	2.286 BSC			
A	2.20	2.30	2.38	
A1	0	-	0.127	
c	0.46	0.50	0.60	
c2	0.46	0.50	0.58	
D1	5.21	-	-	
E1	4.40	-	-	
θ	0°		10°	

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
M_d	Mounting torque	M3 Screw 6-32 Screw	1/8.8	-	Nm/ lbf-in