

# P3CD04065C

650V/4A 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

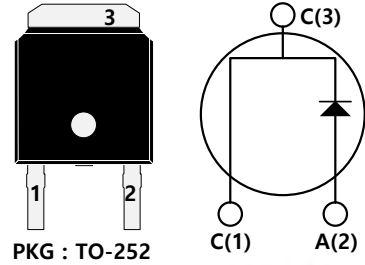
Key Characteristics		
$V_{RRM}$	650	V
$I_F, T_C \leq 150^\circ\text{C}$	4	A
$Q_C$	11	nC

## 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	$T_C=25^\circ\text{C}$	11	A
		$T_C=135^\circ\text{C}$	5	A
		$T_C=150^\circ\text{C}$	4	A
$I_{FRM}$	Repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave, $D=0.3$	15	A
$I_{FSM}$	Non-repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave	35	A
$P_{TOT}$	Power Dissipation	$T_C=25^\circ\text{C}$	53.2	W
		$T_C=110^\circ\text{C}$	23	
$T_j$	Operating Junction		-55 to 175	$^\circ\text{C}$
$T_{stg}$	Storage Temperature		-55 to 175	$^\circ\text{C}$

**Thermal Characteristics**

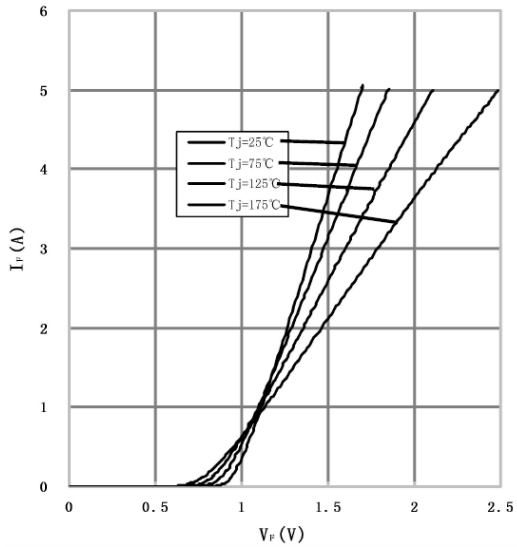
Symbol	Parameter	Test Condition	Value	Unit
			Typ.	
$R_{thJc}$	Thermal resistance from junction to case		2.82	°C/W

**Electrical Characteristics, Nomination temperature T<sub>j</sub>=25°C**

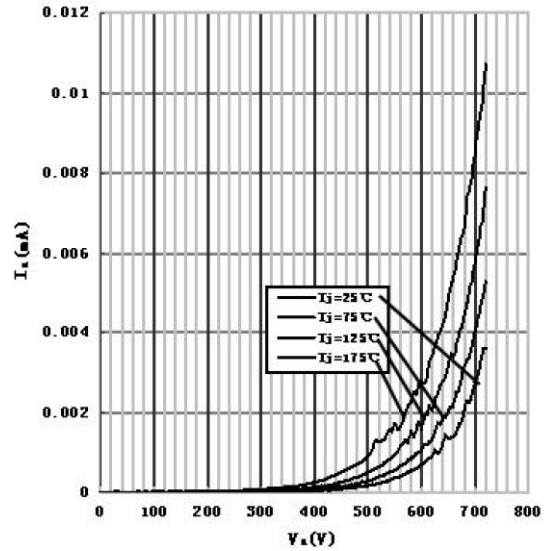
Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$V_F$	Forward Voltage	$I_F=4A, T_j=25^\circ C$	1.57	1.7	V
		$I_F=4A, T_j=175^\circ C$	1.8	2.5	
$I_R$	Reverse Current	$V_R=650V, T_j=25^\circ C$	10	50	$\mu A$
		$V_R=650V, T_j=175^\circ C$	20	100	
$Q_C$	Total capacitive Charge	$V_R=400V, T_j=150^\circ C$ $Q_C = \int_0^{V_R} C(V)dV$	11	-	nC
C	Total Capacitance	$V_R=0V, T_j=25^\circ C, f=1MHZ$	181	220	pF
		$V_R=200V, T_j=25^\circ C, f=1MHZ$	22.5	25	
		$V_R=400V, T_j=25^\circ C, f=1MHZ$	20.5	21	

## Performance Graphs

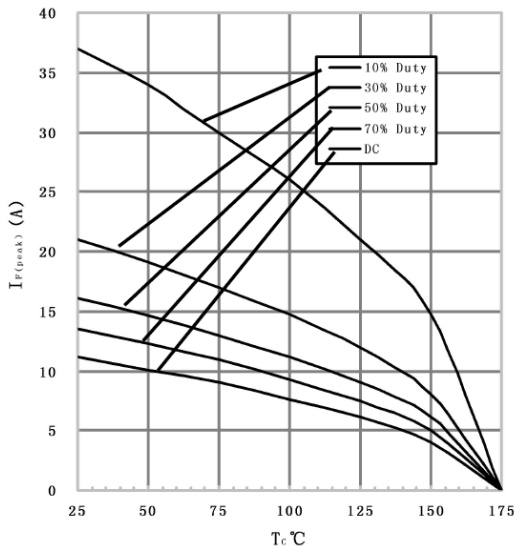
1) Forward IV characteristics as a function of  $T_j$



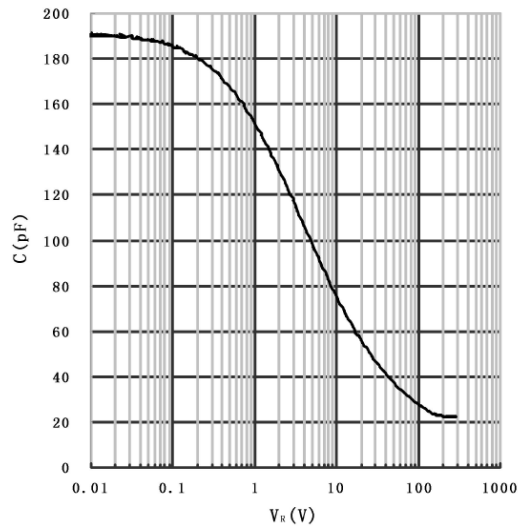
2) Reverse IV characteristics as a function of  $T_j$



3) Current Derating

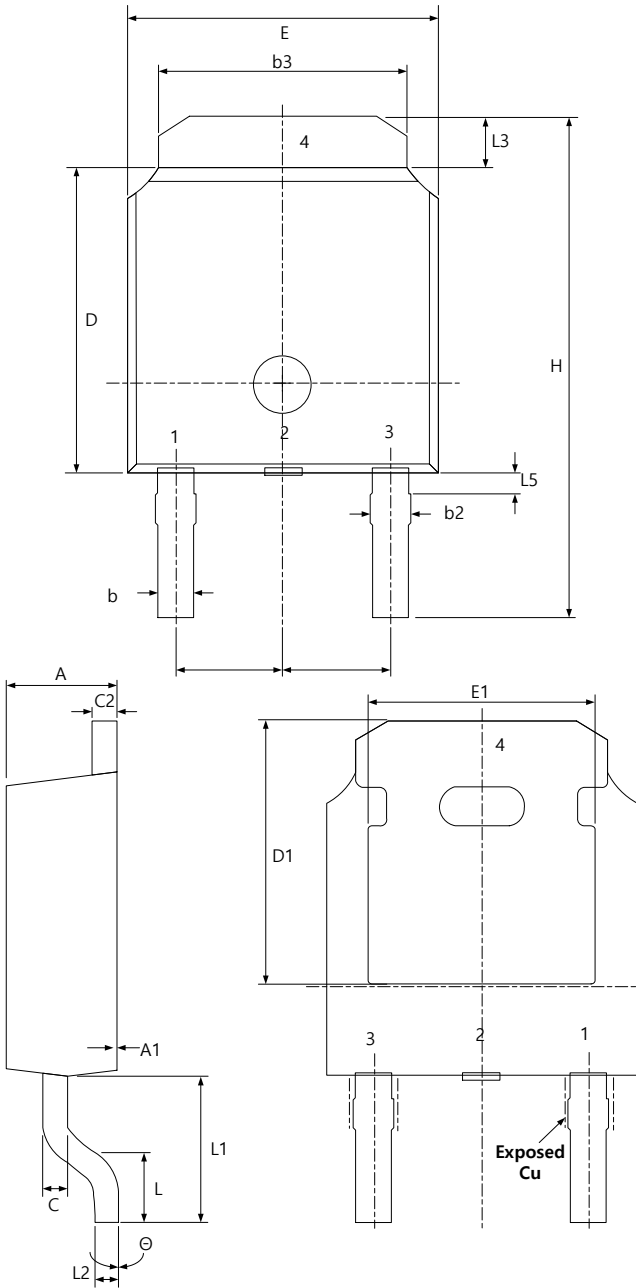


4) Capacitance VS. reverse voltage





**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 <sub>d</sub>	Mounting torque	M3 Screw 6-32 Screw	1/8.8	-	Nm/ lbf-in