

# P3CD10170A

1700V/10A 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

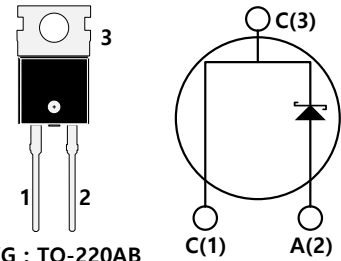
Key Characteristics		
$V_{RRM}$	1700	V
$I_F, T_C \leq 140^\circ\text{C}$	10	A
$Q_C$	120	nC

## 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-220AB



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

Symbol	Parameter	Test Condition	Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage		1700	V
$V_{RSM}$	Surge Peak Reverse Voltage		1700	V
$V_{DC}$	DC Blocking Voltage		1700	V
$I_F$	Continuous Forward Current	$T_C=25^\circ\text{C}$	24	A
		$T_C=75^\circ\text{C}$	19	A
		$T_C=140^\circ\text{C}$	10	A
$I_{FRM}$	Repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave, $D=0.3$	50	A
$I_{FSM}$	Non-repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave	100	A
$P_{TOT}$	Power Dissipation	$T_C=25^\circ\text{C}$	192	W
		$T_C=110^\circ\text{C}$	83	
$T_j$	Operating Junction		-55 to 175	$^\circ\text{C}$
$T_{stg}$	Storage Temperature		-55 to 175	$^\circ\text{C}$



**Thermal Characteristics**

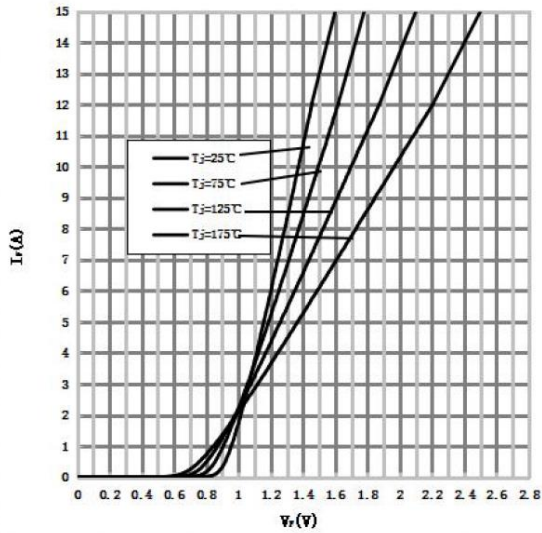
Symbol	Parameter	Test Condition	Value	Unit
			Typ.	
$R_{thJc}$	Thermal resistance from junction to case		0.78	°C/W

**Electrical Characteristics, Nomination temperature  $T_j=25^{\circ}\text{C}$**

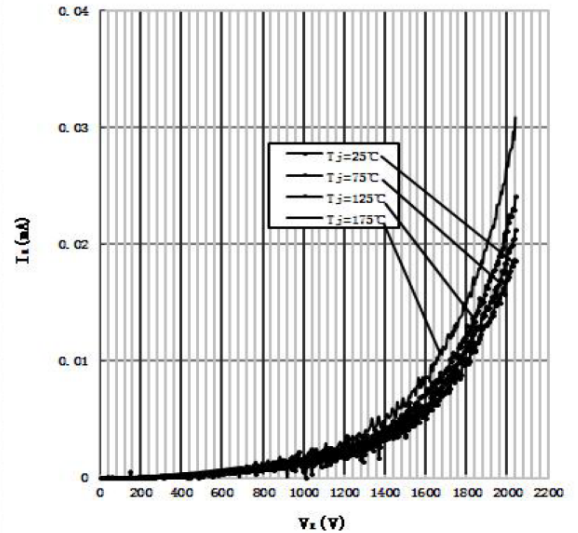
Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$V_F$	Forward Voltage	$I_F=10\text{A}, T_j=25^{\circ}\text{C}$	1.34	1.7	V
		$I_F=10\text{A}, T_j=175^{\circ}\text{C}$	2	2.5	
$I_R$	Reverse Current	$V_R=1700\text{V}, T_j=25^{\circ}\text{C}$	10	100	$\mu\text{A}$
		$V_R=1700\text{V}, T_j=175^{\circ}\text{C}$	20	200	
$Q_C$	Total capacitive Charge	$V_R=1200\text{V}, T_j=150^{\circ}\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$	120	-	nC
C	Total Capacitance	$V_R=0\text{V}, T_j=25^{\circ}\text{C}, f=1\text{MHZ}$	1500	1600	pF
		$V_R=400\text{V}, T_j=25^{\circ}\text{C}, f=1\text{MHZ}$	87	95	
		$V_R=800\text{V}, T_j=25^{\circ}\text{C}, f=1\text{MHZ}$	63	70	

## Performance Graphs

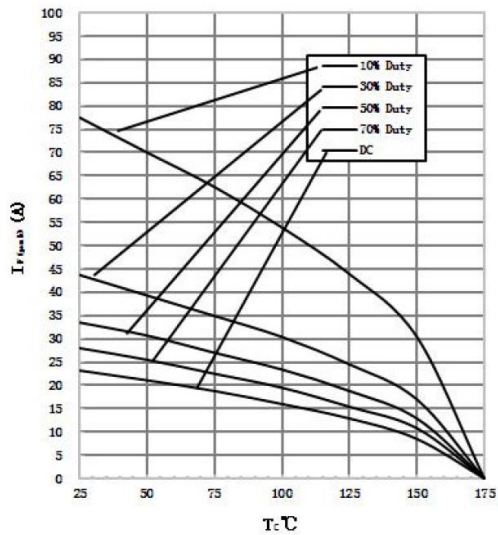
1) Forward IV characteristics as a function of  $T_j$



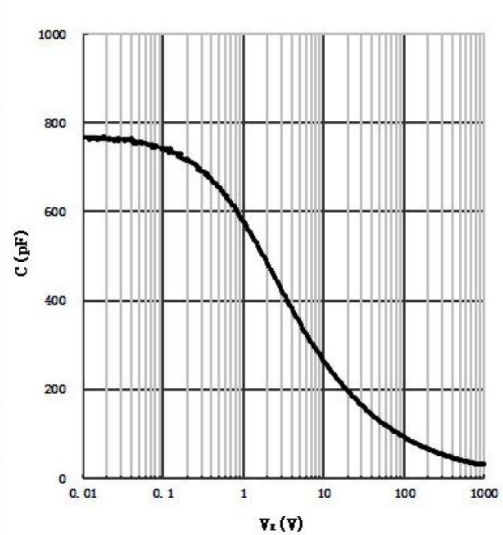
2) Reverse IV characteristics as a function of  $T_j$



3) Current Derating

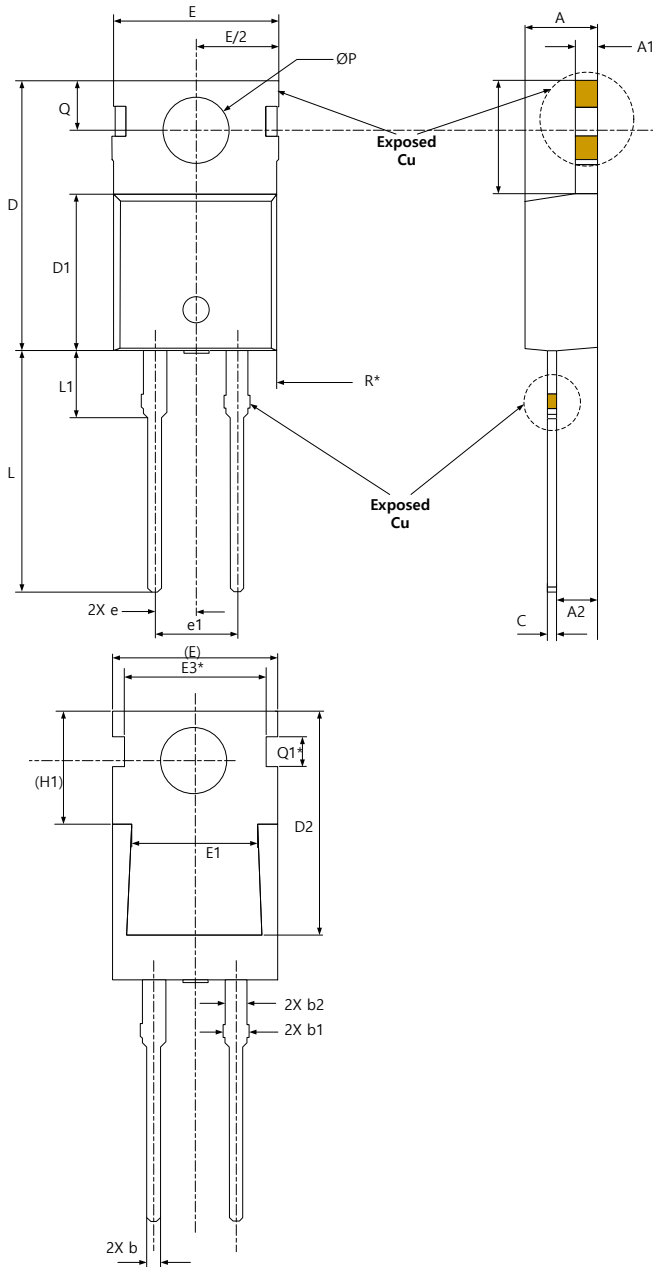


4) Capacitance VS. reverse voltage





### Package Outline



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
<b>A</b>	4.24	4.44	4.64	
<b>A1</b>	1.15	1.27	1.40	
<b>A2</b>	2.30	2.48	2.70	
<b>b</b>	0.70	0.80	0.90	
<b>b1</b>	1.20	1.55	1.75	
<b>b2</b>	1.20	1.45	1.70	
<b>c</b>	0.40	0.50	0.60	
<b>D</b>	14.70	15.37	16.00	4
<b>D1</b>	8.82	8.92	9.02	
<b>D2</b>	12.63	12.73	12.83	5
<b>E</b>	9.96	10.16	10.36	4, 5
<b>E1</b>	6.86	7.77	8.89	5
<b>E3*</b>	8.70 REF			
<b>e</b>	2.54 BSC			
<b>e1</b>	5.08 BSC			
<b>H1</b>	6.30	6.45	6.60	5.6
<b>L</b>	13.47	13.72	13.97	
<b>L1</b>	3.60	3.80	4.00	
<b><math>\phi P</math></b>	3.75	3.84	3.93	
<b>Q</b>	2.60	2.80	3.00	
<b>Q1*</b>	1.73 REF			
<b>R*</b>	1.82 REF			

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$M_d$	Mounting torque	TO-220AC M3 Screw 6-32 Screw	1/8.8	-	Nm/lbf.in.