

## SiC SBD P3D06020K3 650V SiC Schottky Diode

### Features

- Qualified to AEC-Q101
- Ultra-Fast Switching
- Zero Reverse Recovery Current
- High-Frequency Operation
- Positive Temperature Coefficient on  $V_F$
- High Surge Current
- 100% UIS tested

### Standards Benefits

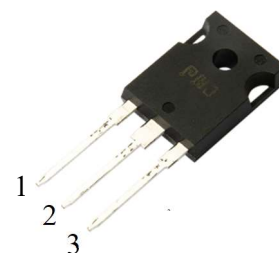
- Improve System Efficiency
- Reduction of Heat Sink Requirement
- Essentially No Switching Losses
- Parallel Devices Without Thermal Runaway

### Application

- Consumer SMPS
- Boost Diodes in PFC or DC/DC Stages
- AC/DC Converters

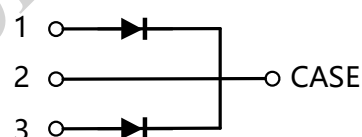
### Order Information

Part Number	Package	Marking
P3D06020K3	TO-247-3	P3D06020K3



TO-247-3

Anode	1
Anode	3
Cathode	2



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## 1. Maximum Ratings

At  $T_J = 25^\circ\text{C}$ , unless specified otherwise

Parameter	Symbol	Value	Unit	Test condition
Repetitive Peak Reverse Voltage	$V_{RRM}$	650	V	$T_C = 25^\circ\text{C}$
Surge Peak Reverse Voltage	$V_{RSM}$	650	V	$T_C = 25^\circ\text{C}$
DC Blocking Voltage	$V_R$	650	V	$T_C = 25^\circ\text{C}$
Forward Current (Per Leg/Device)	$I_F$	36/72 22/44 10/20	A	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ $T_C = 150^\circ\text{C}$
Repetitive Peak Forward Surge Current(Per Leg)	$I_{FRM}$	62 35	A	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$ $T_C = 125^\circ\text{C}, t_p = 10\text{ms}$
Non-Repetitive Forward Surge Current(Per Leg)	$I_{FSM}$	88 73	A	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$ $T_C = 125^\circ\text{C}, t_p = 10\text{ms}$
Non-Repetitive Forward Surge Current (Per Leg)	$I_{F,MAX}$	733 694	A	$T_C = 25^\circ\text{C}, t_p = 10\mu\text{s}$ $T_C = 125^\circ\text{C}, t_p = 10\mu\text{s}$
Power Dissipation (Per Leg)	$P_{tot}$	187	W	$T_C = 25^\circ\text{C}$
Operating Junction and Storage Temperature	$T_J, T_{STG}$	-55 to +175	$^\circ\text{C}$	
TO-247 Mounting Torque M3 Screw	$T_{orq}$	1 8.8	Nm lbf-in	

## 2. Thermal Characteristics

Parameter	Symbol	Values	Unit
Thermal Resistance from Junction to Case (Per Leg)	$R_{\theta JC}$	0.8	$^\circ\text{C}/\text{W}$

### 3. Electrical Characteristics

At  $T_J = 25^\circ\text{C}$ , unless specified otherwise (Per Leg)

Parameter	SymAbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Forward Voltage	$V_F$	/	1.4	1.6	V	$I_F = 10\text{A}, T_J = 25^\circ\text{C}$
			1.7	/		$I_F = 10\text{A}, T_J = 175^\circ\text{C}$
Reverse Current	$I_R$	/	2	38	$\mu\text{A}$	$V_R = 650\text{V}, T_J = 25^\circ\text{C}$
			10	/		$V_R = 650\text{V}, T_J = 175^\circ\text{C}$
Total Capacitance	C	/	550	/	pF	$V_R = 0\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
			60			$V_R = 200\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
			59			$V_R = 400\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
Total Capacitive Charge	$Q_C$	/	30	/	nC	$V_R = 400\text{V}$
Capacitance Stored Energy	$E_C$	/	4.8	/	$\mu\text{J}$	$V_R = 400\text{V}$

## 4. Typical Performance

At  $T_J = 25^\circ\text{C}$ , unless specified otherwise (Per Leg)

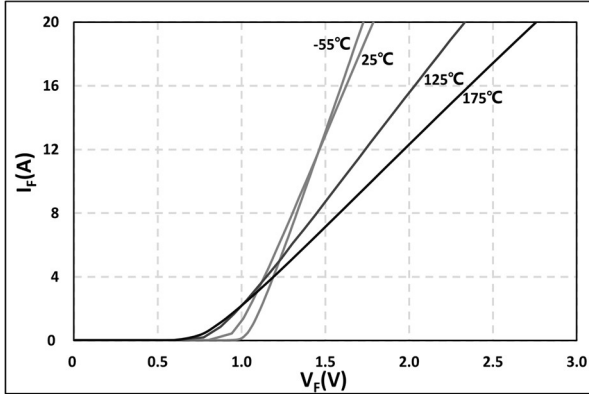


Fig. 1 Typical Forward Characteristics  
 $I_F = f(V_F)$ ;  $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

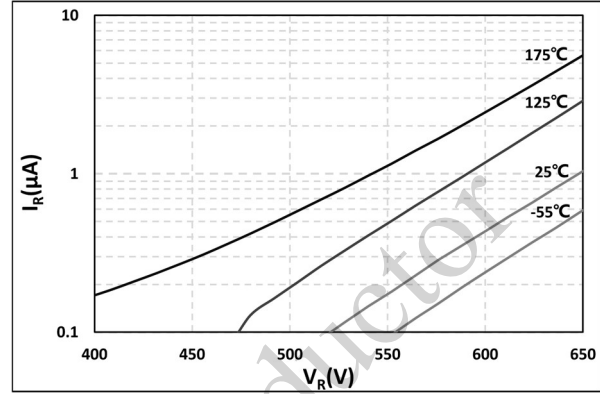


Fig. 2 Reverse Characteristics  
 $I_R = f(V_R)$ ;  $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

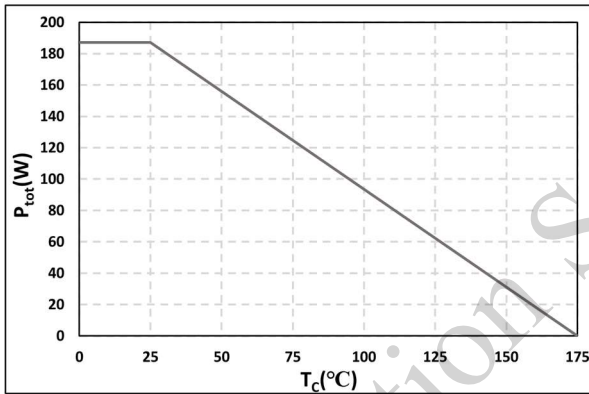


Fig. 3 Typical Power Derating  
 $P_{tot} = f(T_c)$

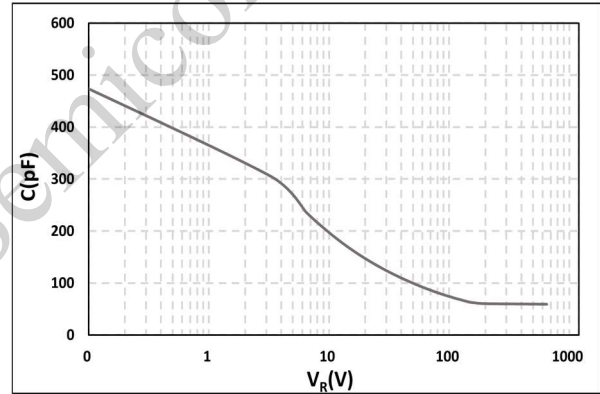


Fig. 4 Typical Total Capacitance  
 $C = f(V_R)$

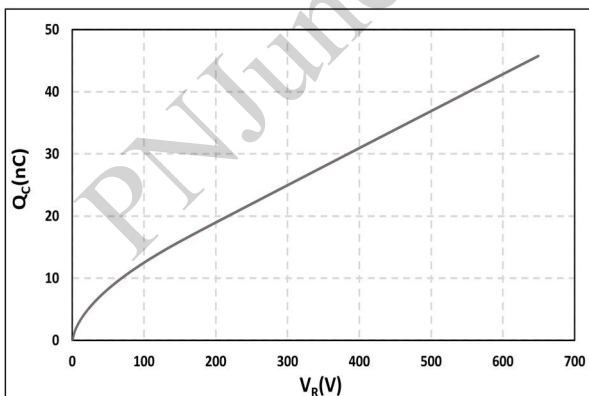


Fig. 5 Typical Total Capacitive Charge  
 $Q_C = f(V_R)$

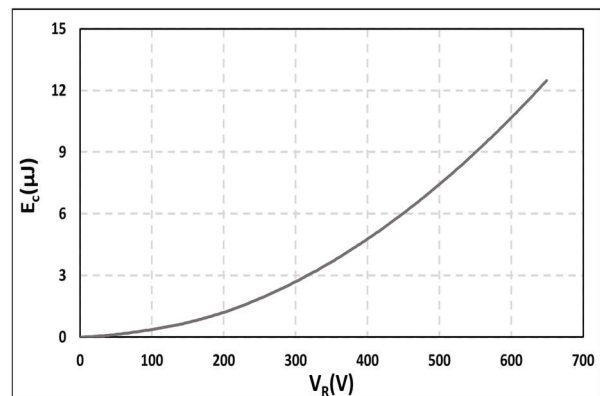


Fig. 6 Capacitance Stored Energy  
 $E_C = f(V_R)$

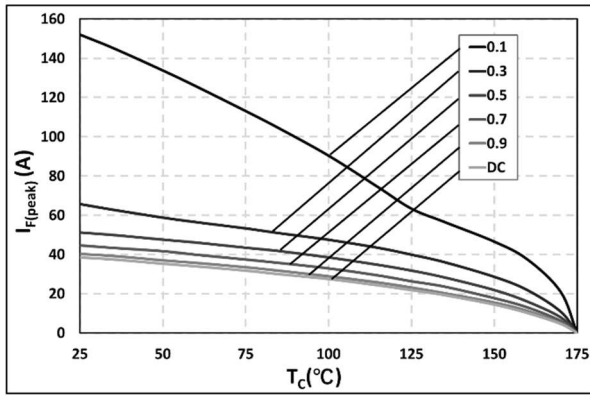


Fig. 7 Current Derating

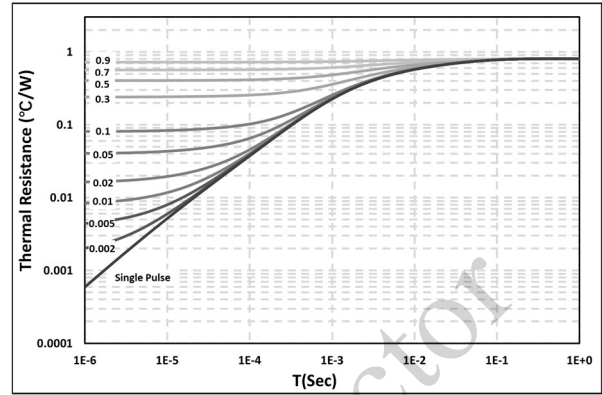


Fig. 8 Transient Thermal Impedance

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