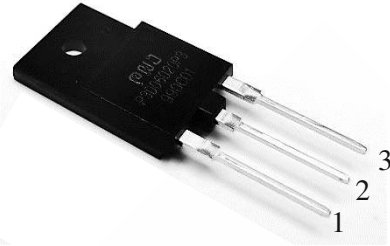


## SiC SBD P3D06020P3 650V SiC Schottky Diode

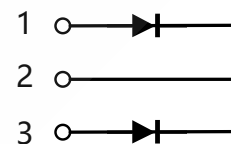


### Features

- Qualified to AEC-Q101
- Ultra-Fast Switching
- Zero Reverse Recovery Current
- High-Frequency Operation
- Positive Temperature Coefficient on  $V_F$
- High Surge Current
- Full Isolated Package for Direct Heat Sinking
- 100% UIS tested

TO-3PF-3

Anode	1
Cathode	2
Anode	3



### 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
P3D06020P3	TO-3PF-3	P3D06020P3



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PN Junction Semiconductor

## 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)	$I_F$	20/40 11/22 10/20	A	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ $T_C = 135^\circ\text{C}$
Repetitive Peak Forward Surge Current (Per Leg)	$I_{FRM}$	37 20	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)	$I_{FSM}$	62 52	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)	$I_{F, MAX}$	490 458	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)	$P_{tot}$	57	W	$T_C = 25^\circ\text{C}$
Operating Junction and Storage Temperature	$T_J, T_{STG}$	-55 to +175	$^\circ\text{C}$	
TO-3PF 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)	$R_{\theta JC}$	2.63	$^\circ\text{C}/\text{W}$

### 3. Electrical Characteristics

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

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Forward Voltage	$V_F$	/	1.39	1.6	V	$I_F = 10\text{A}$ , $T_J = 25^\circ\text{C}$
			1.65	/		$I_F = 10\text{A}$ , $T_J = 175^\circ\text{C}$
Reverse Current	$I_R$	/	12.8	44	$\mu\text{A}$	$V_R = 650\text{V}$ , $T_J = 25^\circ\text{C}$
			424	/		$V_R = 650\text{V}$ , $T_J = 175^\circ\text{C}$
Total Capacitance	C	/	418	/	$\text{pF}$	$V_R = 0\text{V}$ , $T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
			42			$V_R = 200\text{V}$ , $T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
			32			$V_R = 400\text{V}$ , $T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
Total Capacitive Charge	$Q_C$	/	21.8	/	nC	$V_R = 400\text{V}$ , $I_F = 10\text{A}$ $T_J = 25^\circ\text{C}$
Capacitance Stored Energy	$E_C$	/	2.61	/	$\mu\text{J}$	$V_R = 400\text{V}$

## 4. Typical Performance

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

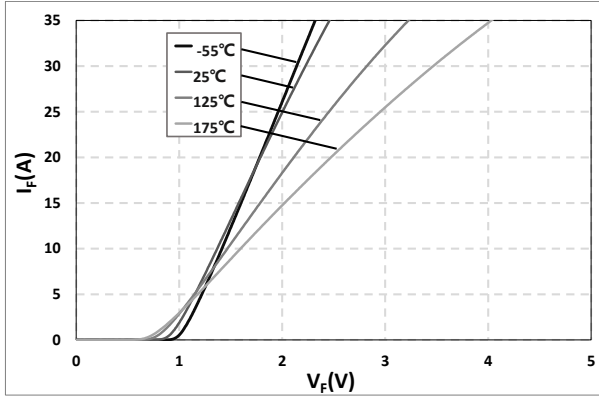


Fig. 1 Typical Forward Characteristics  
 $I_F = f(V_F)$ ;  $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

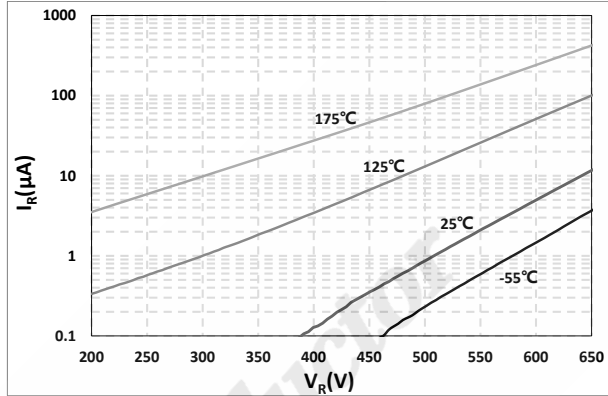


Fig. 2 Reverse Characteristics  
 $I_R = f(V_R)$ ;  $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

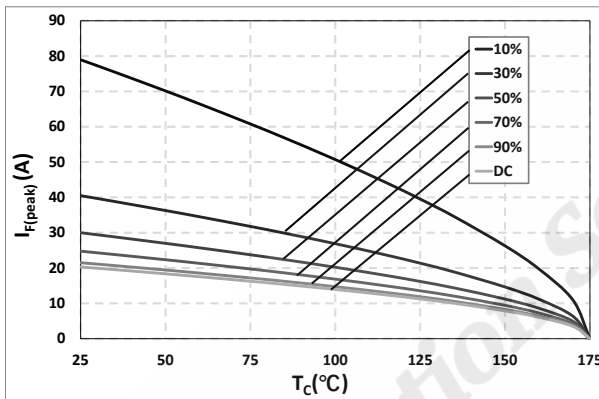


Fig. 3 Current Derating

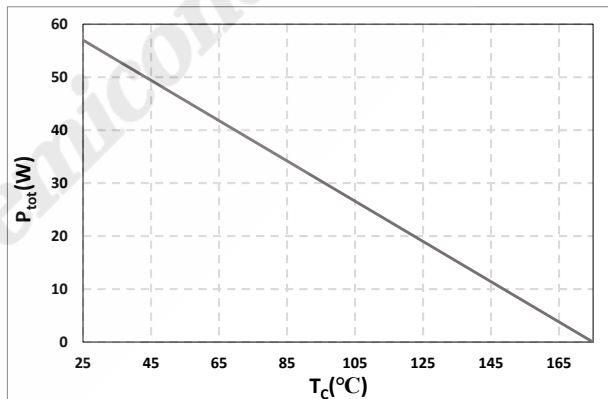


Fig. 4 Typical Power Derating  
 $P_{tot} = f(T_C)$

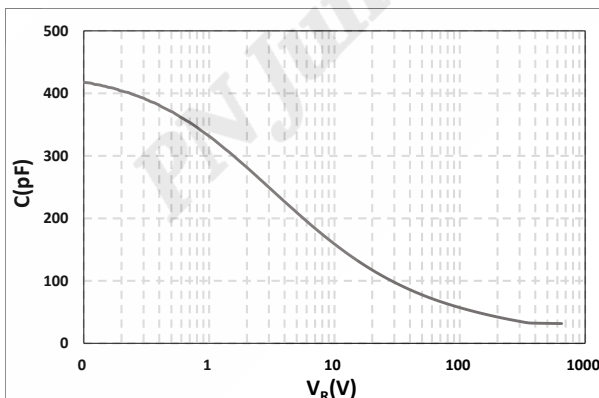


Fig. 5 Typical Total Capacitance  
 $C = f(V_R)$

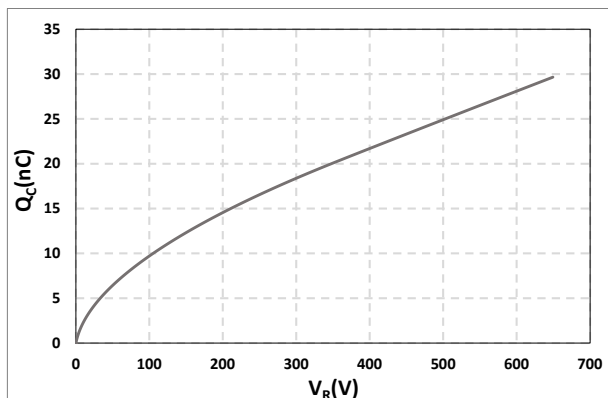


Fig. 6 Typical Total Capacitive Charge  
 $Q_C = f(V_R)$

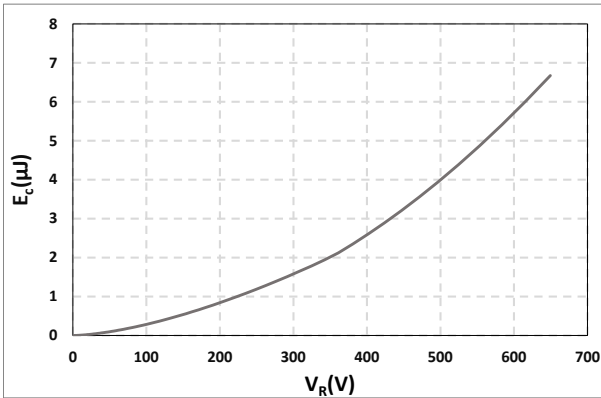


Fig.7 Capacitance Stored Energy  
 $E_C = f(V_R)$

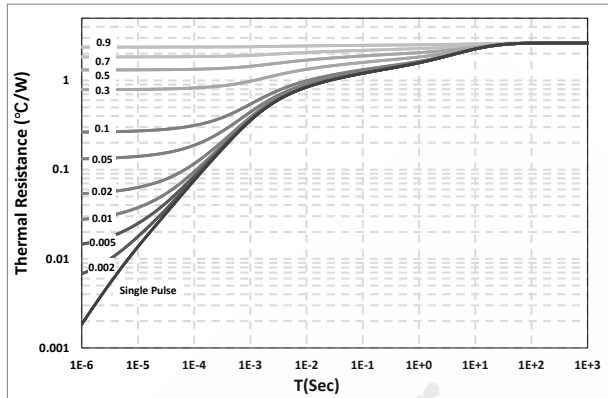
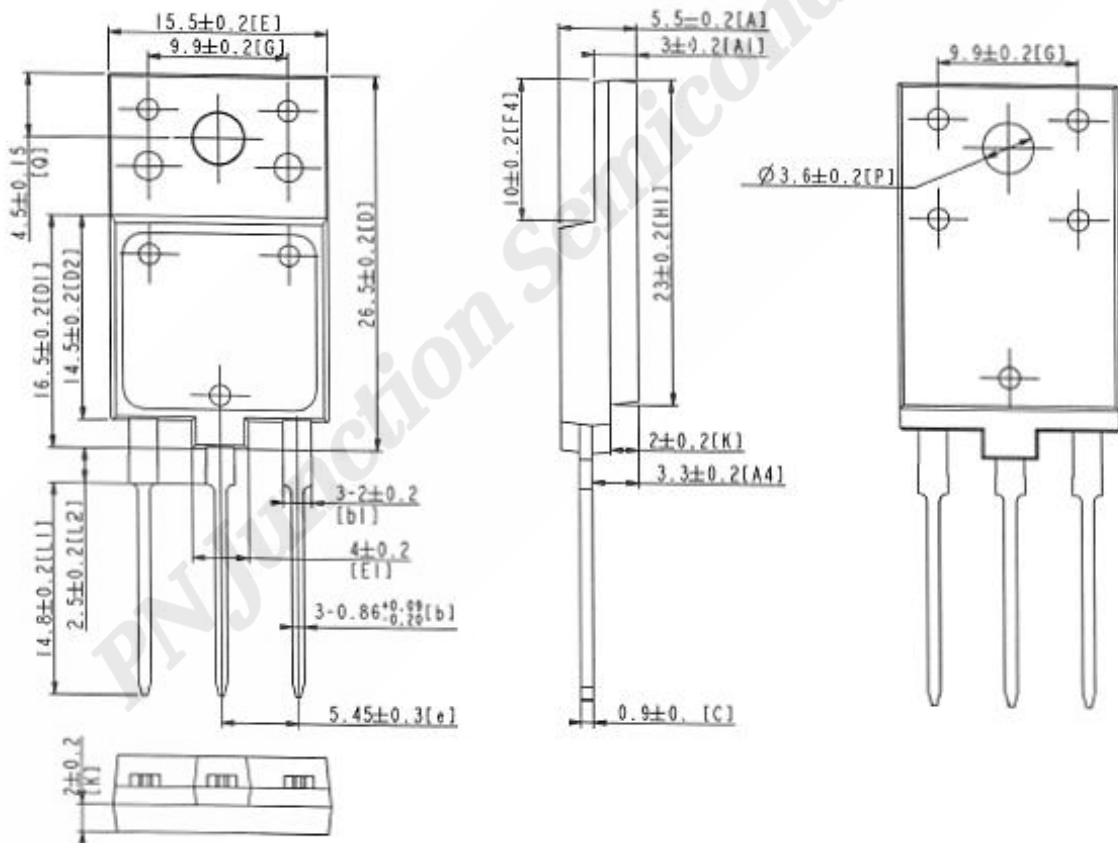


Fig.8 Transient Thermal Impedance

## 5. Package Outlines



Drawing and dimensions