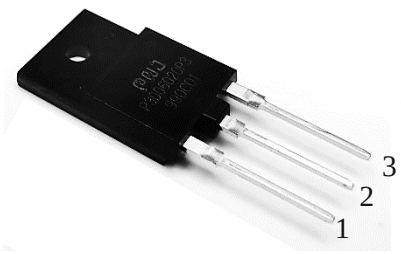
| | | |
|---|---|---|
| $V_{RRM}$ | = 650 | V |
| Qc | = 2×21.8 | nC |
| $I_F$(135≤℃) | = 2×10 | A |
| $V_F$ | = 1.39 | V |

# SiC SBD P3D06020P3

## 650V SiC Schottky Diode

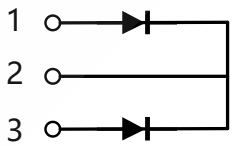



## Features

- 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

RoHS

## Application

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

Halogen

## Order Information

| Part Number | Package | Marking |
|---|---|---|
| P3D06020P3 | TO-3PF-3 | P3D06020P3 |

PN Junction Semiconductor

## Contents

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# 1. Maximum Ratings

At $T_J$= 25℃, unless specified otherwise

| Parameter | Symbol | Value | Unit | Test condition |
|---|---|---|---|---|
| Repetitive Peak Reverse Voltage | $V_{RRM}$ | 650 | V | $T_C$= 25℃ |
| Surge Peak Reverse Voltage | $V_{RSM}$ | 650 | V | $T_C$= 25℃ |
| DC Blocking Voltage | $V_R$ | 650 | V | $T_C$= 25℃ |
| Forward Current (Per Leg/Device) | $I_F$ | 20/40<br>11/22<br>10/20 | A | $T_C$= 25℃<br>$T_C$= 125℃<br>$T_C$= 135℃ |
| Repetitive Peak Forward Surge Current (Per Leg) | $I_{FRM}$ | 37<br>20 | A | $T_C$= 25℃, $t_p$= 10ms<br>$T_C$= 125℃, $t_p$= 10ms |
| Non-Repetitive Forward Surge Current (Per Leg) | $I_{FSM}$ | 62<br>52 | A | $T_C$= 25℃, $t_p$= 10ms<br>$T_C$= 125℃, $t_p$= 10ms |
| Non-Repetitive Forward Surge Current (Per Leg) | $I_{F, MAX}$ | 490<br>458 | A | $T_C$= 25℃, $t_p$= 10μs<br>$T_C$= 125℃, $t_p$= 10μs |
| Power Dissipation (Per Leg) | $P_{tot}$ | 57 | W | $T_C$= 25℃ |
| Operating Junction and Storage Temperature | $T_J$, $T_{STG}$ | -55 to +175 | ℃ | |
| TO-3PF Mounting Torque M3 Screw | $T_{orq}$ | 1<br>8.8 | Nm<br>lbf-in | |

# 2. Thermal Characteristics

| Parameter | Symbol | Values | Unit |
|---|---|---|---|
| Thermal Resistance from Junction to Case (Per Leg) | $R_{\theta JC}$ | 2.63 | ℃/W |

PNJunction semiconductor

## 3. Electrical Characteristics

At $T_J$= 25℃, unless specified otherwise (Per Leg)

| Parameter | Symbol | Values | | | Unit | Test condition |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Forward Voltage | $V_F$ | / | 1.39 | 1.6 | V | $I_F$= 10A, $T_J$= 25℃ |
| | | | 1.65 | / | | $I_F$= 10A, $T_J$= 175℃ |
| Reverse Current | $I_R$ | / | 12.8 | 44 | μA | $V_R$= 650V, $T_J$= 25℃ |
| | | | 424 | / | | $V_R$= 650V, $T_J$= 175℃ |
| Total Capacitance | C | / | 418 | / | pF | $V_R$= 0V, $T_J$= 25℃<br>f= 1MHz |
| | | | 42 | | | $V_R$= 200V, $T_J$= 25℃<br>f= 1MHz |
| | | | 32 | | | $V_R$= 400V, $T_J$= 25℃<br>f= 1MHz |
| Total Capacitive Charge | $Q_C$ | / | 21.8 | / | nC | $V_R$= 400V, $I_F$= 10A<br>$T_J$= 25℃ |
| Capacitance Stored Energy | $E_C$ | / | 2.61 | / | μJ | $V_R$= 400V |

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# 4. Typical Performance

At $T_J$= 25℃, unless specified otherwise (Per Leg)

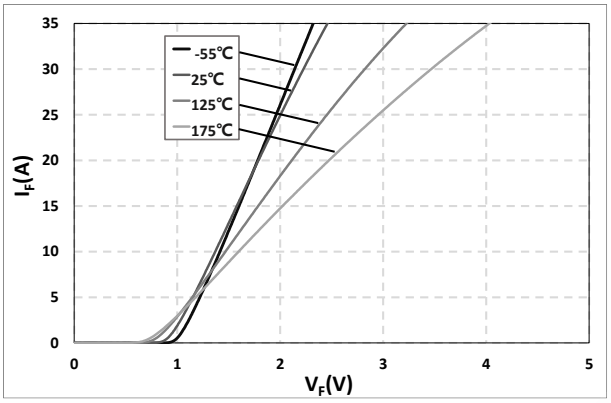


Fig. 1 Typical Forward Characteristics
$I_F = f(V_F)$; $T_J$ = -55℃, 25℃, 125℃, 175℃

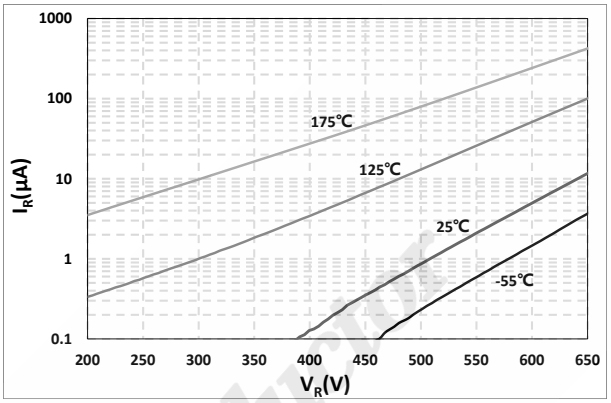


Fig. 2 Reverse Characteristics
$I_R=f(V_R)$; $T_J$ = -55℃, 25℃, 125℃, 175℃

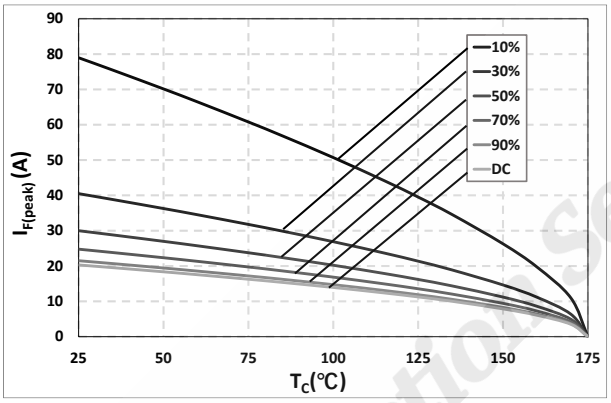


Fig. 3 Current Derating

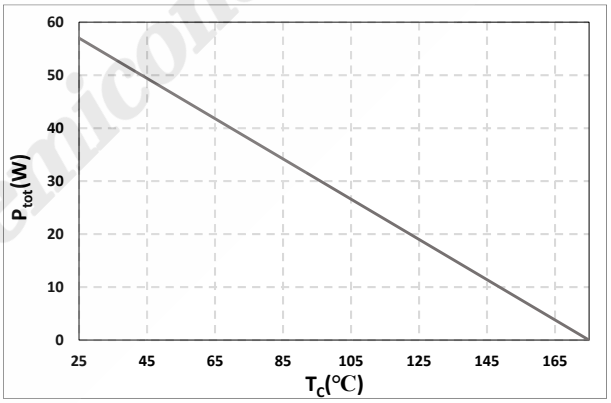


Fig. 4 Typical Power Derating
$P_{tot} = f(T_C)$

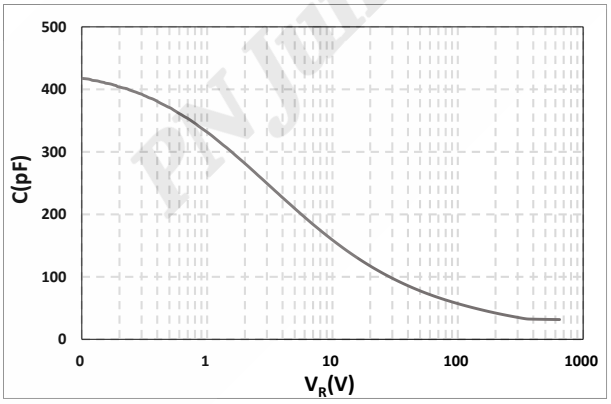


Fig. 5 Typical Total Capacitance
$C=f(V_R)$

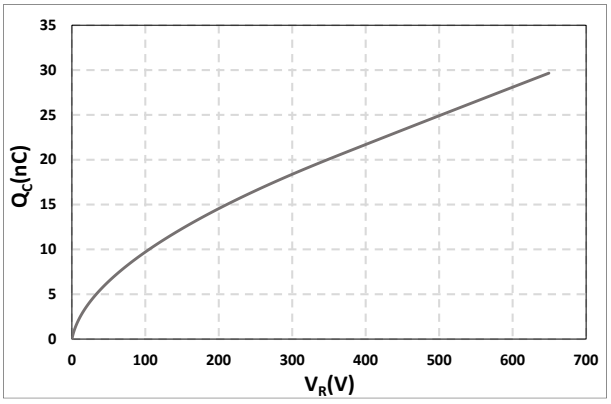


Fig. 6 Typical Total Capacitive Charge
$Q_C = f(V_R)$

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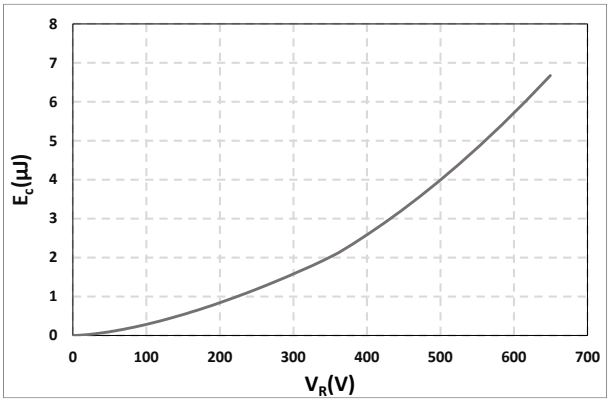



Fig.7 Capacitance Stored Energy
$E_C = f(V_R)$

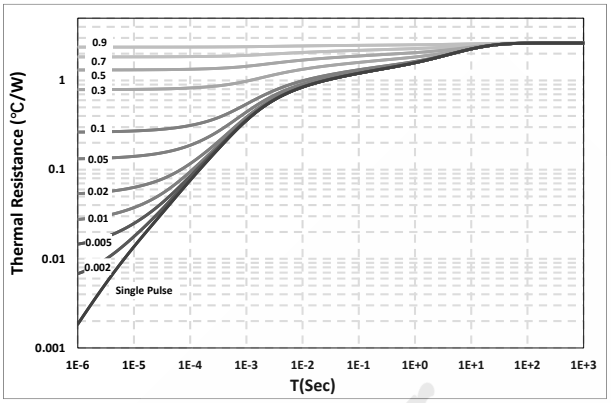
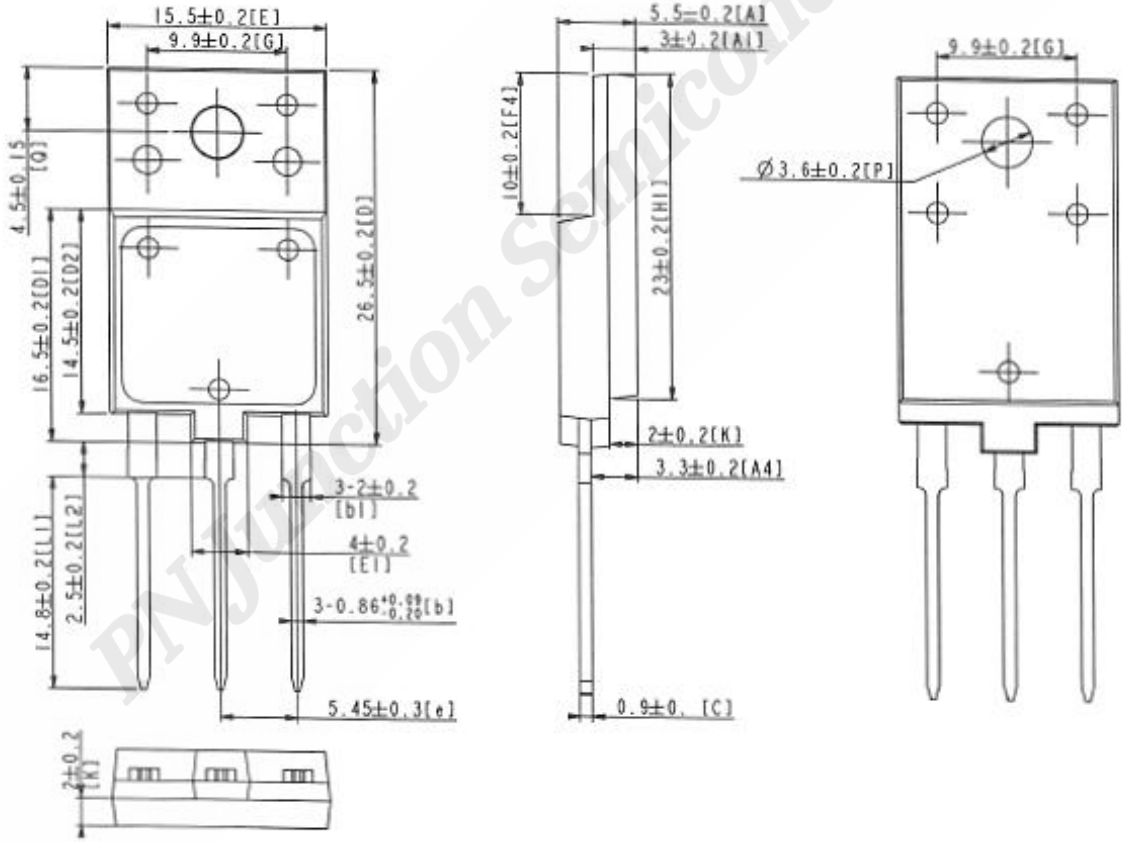



Fig.8 Transient Thermal Impedance

## 5. Package Outlines




Drawing and dimensions

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