

SiC SBD P3D12040K3 1200V SiC Schottky Diode



Features

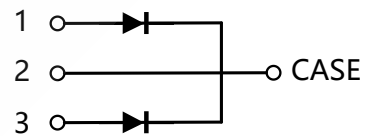
- Qualified to AEC-Q101
- Ultra-Fast Switching
- Zero Reverse Recovery Current
- High-Frequency Operation
- Positive Temperature Coefficient on V_F
- High Surge Current
- 100% UIS tested

TO-247-3

| | |
|---------|---|
| 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 |
|-------------|----------|------------|
| P3D12040K3 | TO-247-3 | P3D12040K3 |



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PNJ Preliminary

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} | 1200 | V | $T_C = 25^\circ\text{C}$ |
| Surge Peak Reverse Voltage | V_{RSM} | 1200 | V | $T_C = 25^\circ\text{C}$ |
| DC Blocking Voltage | V_R | 1200 | V | $T_C = 25^\circ\text{C}$ |
| Forward Current (Per Leg/Device) | I_F | 46/92 27/54 20/40 | A | $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ $T_C = 145^\circ\text{C}$ |
| Repetitive Peak Forward Surge Current (Per Leg) | I_{FRM} | 83 45 | 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} | 150 140 | A | $T_C = 25^\circ\text{C}, t_p = 10\text{ms}$ $T_C = 125^\circ\text{C}, t_p = 10\text{ms}$ |
| Power Dissipation (Per Leg) | P_{tot} | 195 | 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_{torq} | 1 8.8 | Nm lbf-in | |

2. Thermal Characteristics

| Parameter | Symbol | Values | Unit |
|---|-----------------|--------|---------------------------|
| Thermal Resistance from Junction to Case (Per Leg) | $R_{\theta JC}$ | 0.77 | $^\circ\text{C}/\text{W}$ |

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 | / | 1.5 | 1.8 | V | $I_F = 20\text{A}$, $T_J = 25^\circ\text{C}$ |
| | | | 2.1 | / | | $I_F = 20\text{A}$, $T_J = 175^\circ\text{C}$ |
| Reverse Current | I_R | / | 16.5 | 60 | μA | $V_R = 1200\text{V}$, $T_J = 25^\circ\text{C}$ |
| | | | 1363 | / | | $V_R = 1200\text{V}$, $T_J = 175^\circ\text{C}$ |
| Total Capacitance | C | / | 1214 | / | pF | $V_R = 0\text{V}$, $T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$ |
| | | | 82 | | | $V_R = 400\text{V}$, $T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$ |
| | | | 68 | | | $V_R = 800\text{V}$, $T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$ |
| Total Capacitive Charge | Q_C | / | 87 | / | nC | $V_R = 800\text{V}$, $I_F = 20\text{A}$ $di/dt = 200\text{A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$ |
| Capacitance Stored Energy | E_C | / | 22 | / | μJ | $V_R = 800\text{V}$ |

4. Typical Performance

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

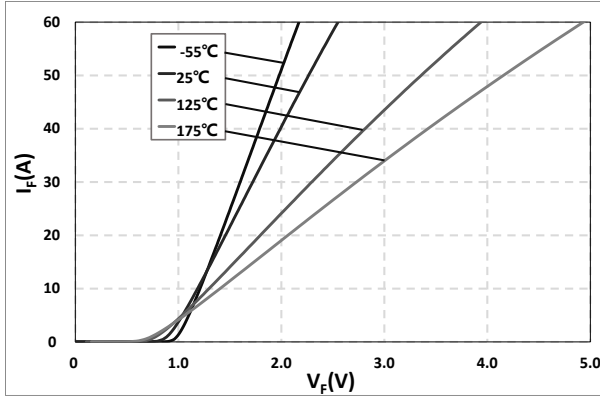


Fig. 1 Typical Forward Characteristics
 $I_F = f(V_F)$; $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

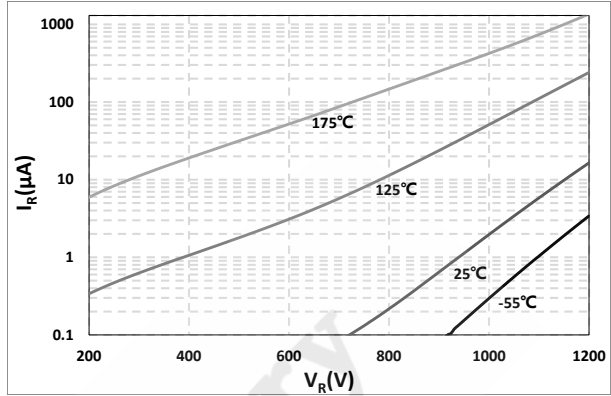


Fig. 2 Reverse Characteristics
 $I_R = f(V_R)$; $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

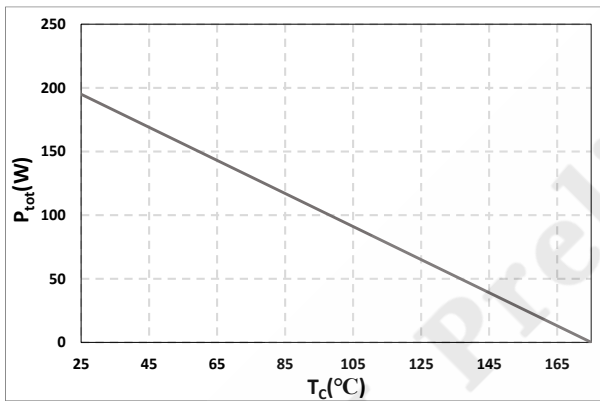


Fig. 3 Typical Power Derating
 $P_{tot} = f(T_c)$

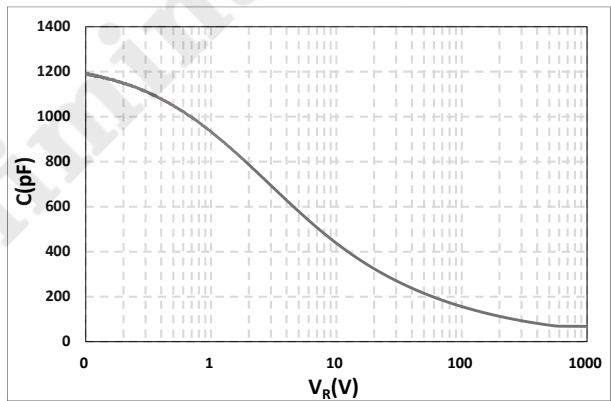


Fig. 4 Typical Total Capacitance
 $C = f(V_R)$

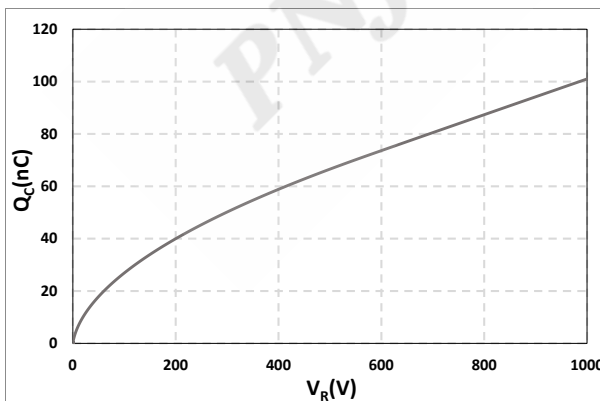


Fig. 5 Typical Total Capacitive Charge
 $Q_C = f(V_R)$

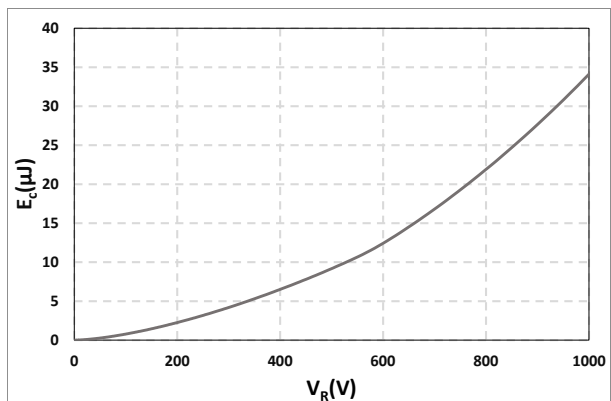


Fig. 6 Capacitance Stored Energy
 $E_C = f(V_R)$

