

SiC SBD P3D06008E2

650V SiC Schottky Diode



TO-252-2

| | |
|---------|---|
| Cathode | 1 |
| Anode | 2 |

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 |
|-------------|----------|------------|
| P3D06008E2 | TO-252-2 | P3D06008E2 |



Contents

| | |
|-------------------------------------|----------|
| Features..... | 1 |
| Standards Benefits | 1 |
| Application..... | 1 |
| Order Information | 1 |
| Contents..... | 2 |
| 1. Maximum Ratings..... | 3 |
| 2. Thermal Characteristics..... | 3 |
| 3. Electrical Characteristics | 4 |
| 4. Typical Performance | 5 |
| 5. Package Outlines..... | 6 |

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} | 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 | I_F | 22 | A | $T_C = 25^\circ\text{C}$ |
| | | 11 | | $T_C = 125^\circ\text{C}$ |
| | | 8 | | $T_C = 145^\circ\text{C}$ |
| Repetitive Peak Forward Surge Current | I_{FRM} | 43 | A | $T_C = 25^\circ\text{C}, t_p = 10\text{ms}$ |
| | | 21 | | $T_C = 125^\circ\text{C}, t_p = 10\text{ms}$ |
| Non-Repetitive Forward Surge Current | I_{FSM} | 60 | A | $T_C = 25^\circ\text{C}, t_p = 10\text{ms}$ |
| | | 52 | | $T_C = 125^\circ\text{C}, t_p = 10\text{ms}$ |
| Power Dissipation | P_{tot} | 85 | W | $T_C = 25^\circ\text{C}$ |
| Operating Junction and Storage Temperature | T_J, T_{STG} | -55 to +175 | $^\circ\text{C}$ | |
| TO-220 Mounting Torque M3 Screw | T_{orq} | 1 | Nm lbf-in | |
| | | 8.8 | | |

2. Thermal Characteristics

| Parameter | Symbol | Values | Unit |
|--|-----------------|--------|---------------------------|
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ | 1.77 | $^\circ\text{C}/\text{W}$ |

3. Electrical Characteristics

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

| Parameter | Symbol | Values | | | Unit | Test condition |
|---------------------------|--------|--------|------|------|---------------|--|
| | | Min. | Typ. | Max. | | |
| Forward Voltage | V_F | / | 1.39 | 1.6 | V | $I_F = 8\text{A}, T_J = 25^\circ\text{C}$ |
| | | | 1.65 | / | | $I_F = 8\text{A}, T_J = 175^\circ\text{C}$ |
| Reverse Current | I_R | / | 10.2 | 36 | μA | $V_R = 650\text{V}, T_J = 25^\circ\text{C}$ |
| | | | 301 | / | | $V_R = 650\text{V}, T_J = 175^\circ\text{C}$ |
| Total Capacitance | C | / | 346 | / | pF | $V_R = 0\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$ |
| | | | 39 | | | $V_R = 200\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$ |
| | | | 30 | | | $V_R = 400\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$ |
| Total Capacitive Charge | Q_C | / | 19.6 | / | nC | $V_R = 400\text{V}, I_F = 8\text{A}$ $T_J = 25^\circ\text{C}$ |
| Capacitance Stored Energy | E_C | / | 2.42 | / | μJ | $V_R = 400\text{V}$ |

4. Typical Performance

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

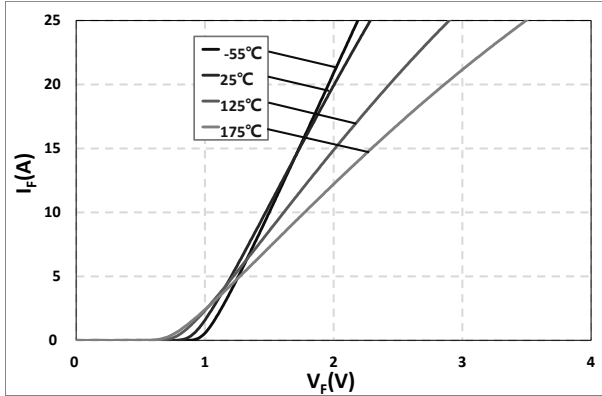


Fig. 1 Typical Forward Characteristics
 $I_F = f(V_F)$; $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

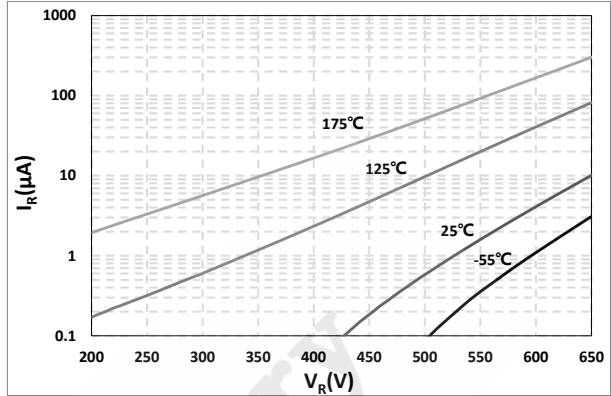


Fig. 2 Reverse Characteristics
 $I_R = f(V_R)$; $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

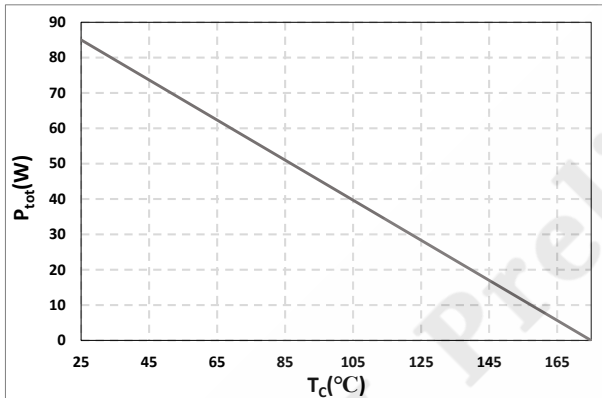


Fig. 3 Typical Power Derating
 $P_{\text{Tot}} = f(T_C)$

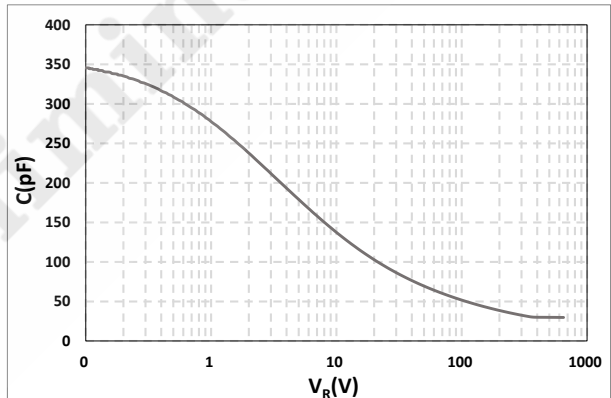


Fig. 4 Typical Total Capacitance
 $C = f(V_R)$

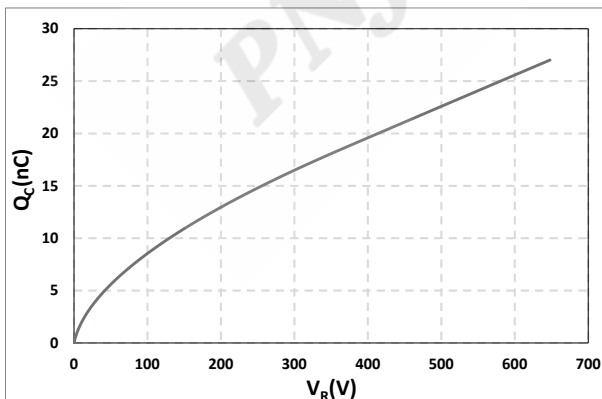


Fig. 5 Typical Total Capacitive Charge
 $Q_C = f(V_R)$

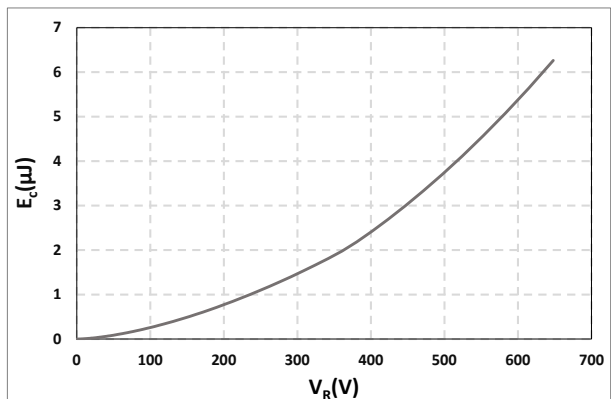
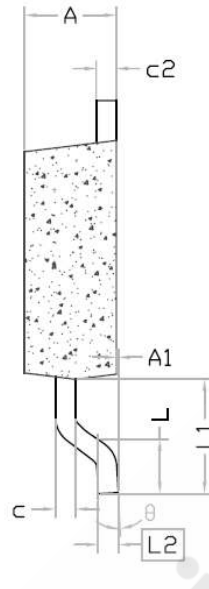
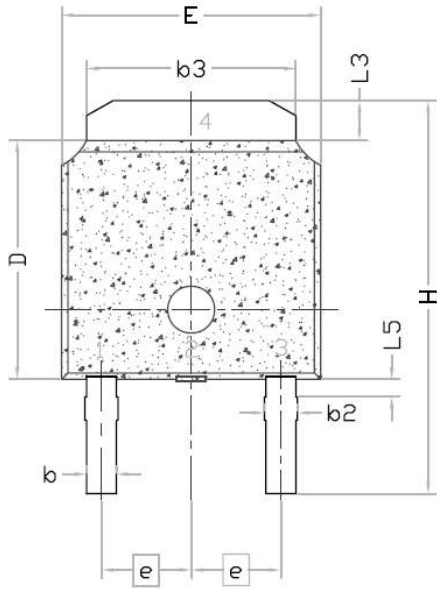


Fig. 6 Capacitance Stored Energy
 $E_C = f(V_R)$

5. Package Outlines



| SYMBOL | DIMENSIONAL REQMTS | | |
|--------|--------------------|-------|-------|
| | MIN | NOM | MAX |
| E | 6.40 | 6.60 | 6.731 |
| L | 1.40 | 1.52 | 1.77 |
| L1 | 2.743 REF | | |
| L2 | 0.508 BSC | | |
| L3 | 0.89 | -- | 1.27 |
| L5 | -- | -- | -- |
| D | 6.00 | 6.10 | 6.223 |
| H | 9.40 | 10.00 | 10.40 |
| b | 0.64 | 0.76 | 0.88 |
| b2 | 0.77 | 0.84 | 1.14 |
| b3 | 5.21 | 5.34 | 5.46 |
| e | 2.286 BSC | | |
| A | 2.20 | 2.30 | 2.38 |
| A1 | 0 | -- | 0.127 |
| c | 0.46 | 0.50 | 0.60 |
| c2 | 0.46 | 0.50 | 0.58 |
| D1 | 5.21 | -- | -- |
| E1 | 4.40 | -- | -- |
| F | -- | -- | 0.45 |
| θ | 0° | -- | 10° |

Drawing and dimensions

PNJ Preliminary