

JP065010D3 Specifications

jPX

3rd Generation 650V/2A SiC Schottky Barrier Diode

1. Basic Information

1.1. General Description

The JP065010D3 SiC Schottky Barrier Diode (SBD) has been developed using JPX's advanced 3rd generation SiC SBD technology with the highest performance and reliability. It registers higher efficiency, higher operation temperature and lower loss and can be operated at higher frequency than Si-based solutions. As to the Schottky structure, it shows no recovery at turn-off and allows a low leakage current with reverse voltage up to 650V. It can contribute to system miniaturization and achieve lightweight system design. Using RoHS compliant components, it is qualified for use in industrial application.

1.2. Features

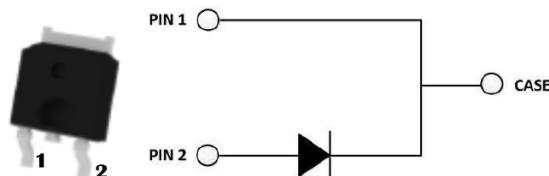
- Revolutionary semiconductor material - Silicon Carbide (SiC)
- No reverse recovery
- Temperature-independent switching behavior
- High-speed switching performance
- System cost / size savings due to reduced cooling requirements
- Junction temperature range from -55°C to 175°C
- RoHS compliant

1.3. Applications

- Industrial power supplies, Industrial UPS
- Battery chargers
- Solar inverters
- Switch mode power supplies

1.4. Specifications

| Device | V _{RRM} | I _F (135°C) | V _F (25°C) | Q _c |
|------------|------------------|------------------------|-----------------------|----------------|
| JP065010D3 | 650V | 14A | 1.30V | 29nC |



Package Type : TO-252-2L

1.5. Electrical Characteristic Diagrams

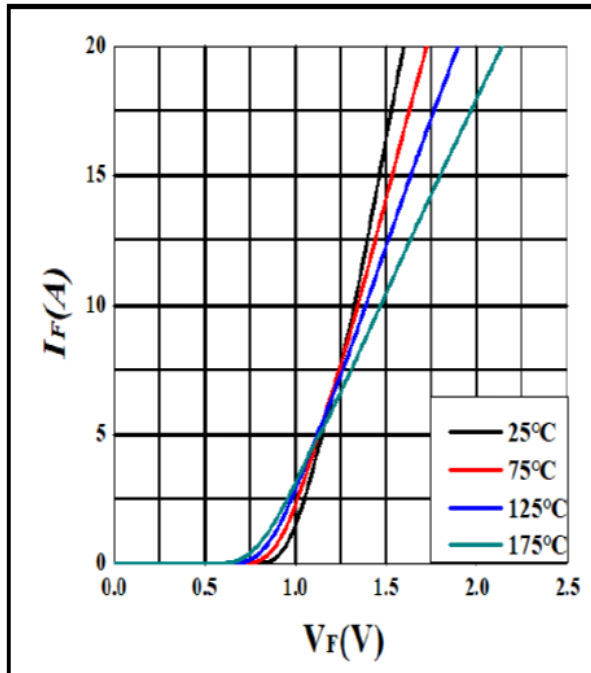


Figure 1. Forward characteristics

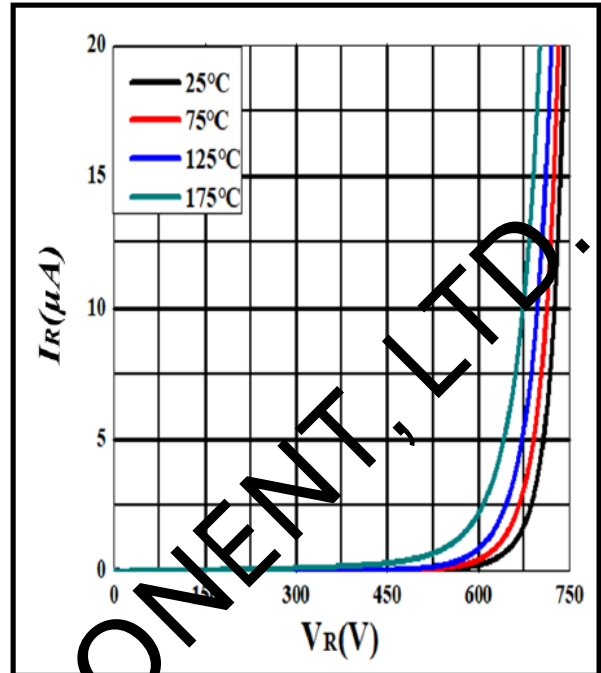


Figure 2. Reverse characteristics

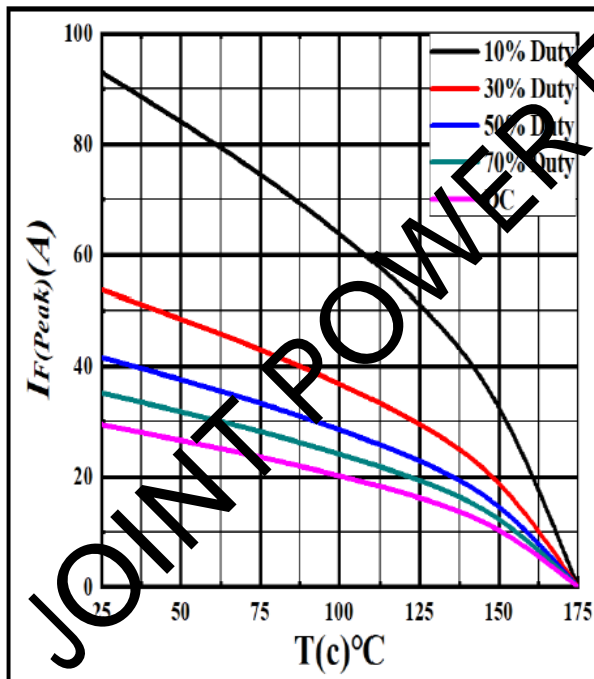


Figure 3. Current derating

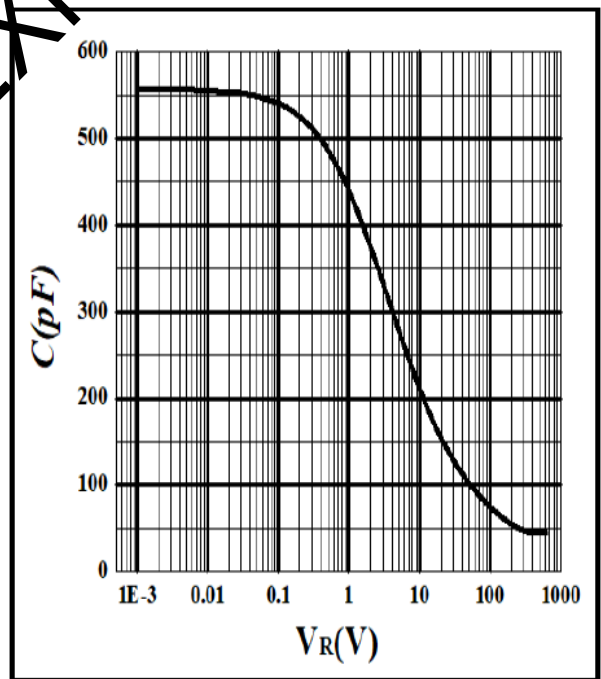


Figure 4. Capacitance vs. reverse voltage

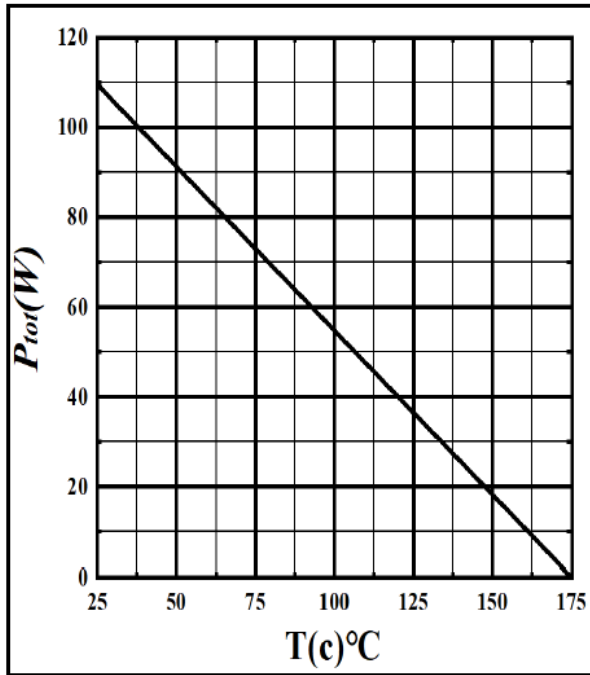


Figure 5. Power derating

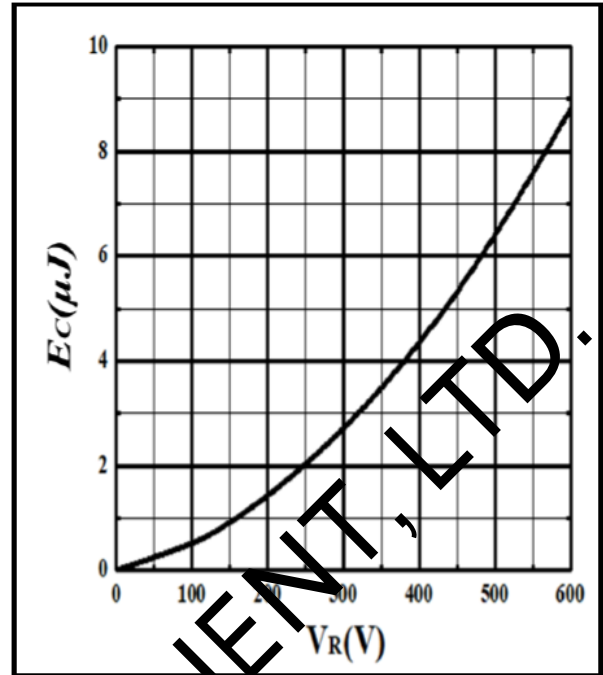


Figure 6. Capacitance stored energy

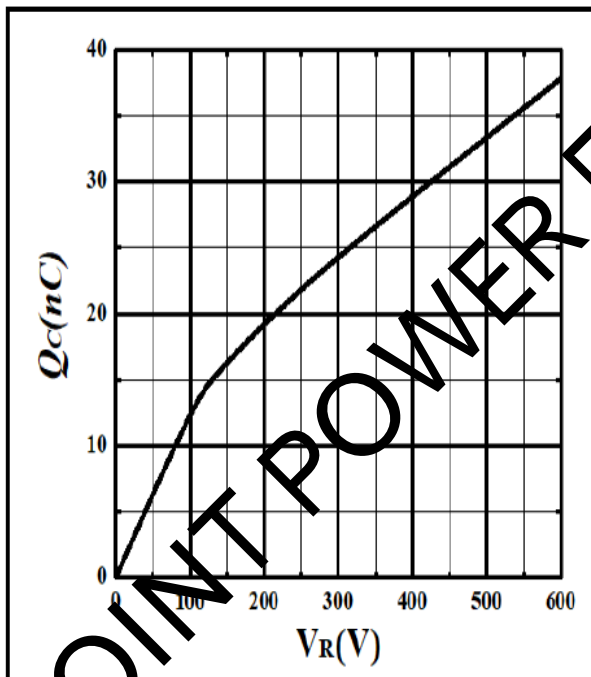


Figure 7. Total capacitance charge vs. reverse voltage

1.6. Absolute Maximum Ratings

($T_C = 25^\circ\text{C}$, unless otherwise specified)

| Parameter | Symbol | Value | Unit | Test conditions |
|--------------------------------------|---------------|---------|----------------------|--|
| 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 reverse voltage | V_{DC} | 650 | V | $T_C = 25^\circ\text{C}$ |
| Continuous forward current | I_F | 29 | A | $T_C = 25^\circ\text{C}$ |
| | | 14 | | $T_C = 135^\circ\text{C}$ |
| | | 10 | | $T_C = 155^\circ\text{C}$ |
| Surge non-repetitive forward current | I_{FSM} | 74 | A | $T_C = 25^\circ\text{C}$, $t_p = 10\text{ms}$, half sine pulse |
| Surge repetitive forward current | I_{FRM} | 41 | A | $T_C = 25^\circ\text{C}$, $t_p = 10\text{ms}$, half sine wave, $D = 0.1$ |
| Power dissipation | P_{tot} | 109 | W | $T_C = 25^\circ\text{C}$ |
| i^2t value | $\int i^2 dt$ | 27 | A^2s | $T_C = 25^\circ\text{C}$, $t_p = 10\text{ms}$ |
| Operating junction temperature | T_j | -55~175 | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | -55~175 | $^\circ\text{C}$ | |

1.7. Thermal Resistance

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---------------|--|-----------------|------|------|------|---------------------------|
| $R_{th(j-c)}$ | Thermal resistance from junction to case | | / | 1.37 | / | $^\circ\text{C}/\text{W}$ |

1.8. Static Electrical Characteristics

($T_j = 25^\circ\text{C}$, unless otherwise specified)

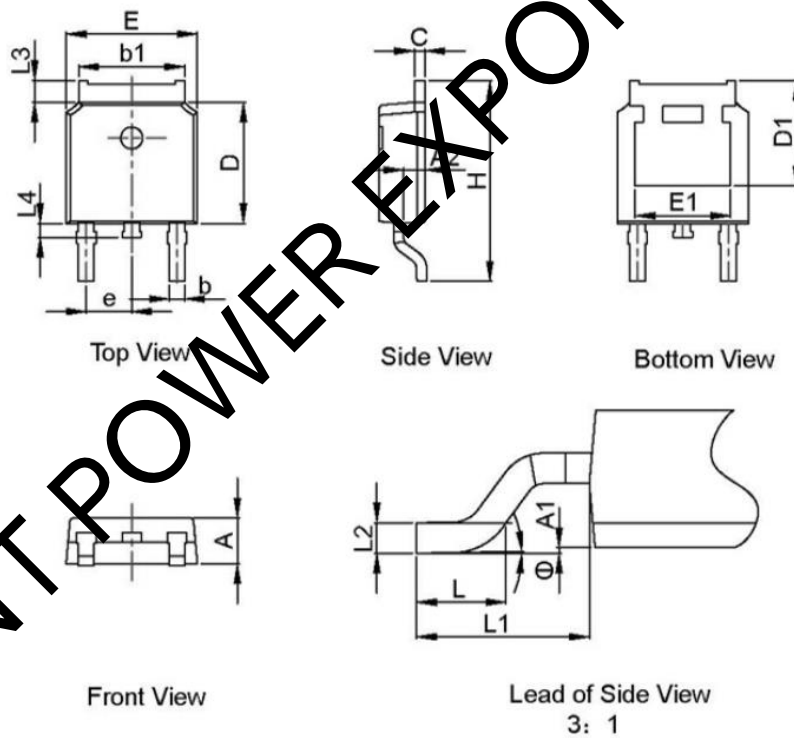
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------|---------------------|---|------|------|------|---------------|
| V_{DC} | DC blocking voltage | $I_R = 100 \mu\text{A}$ | 650 | / | / | V |
| V_F | Forward voltage | $I_F = 10\text{A}$, $T_j = 25^\circ\text{C}$ | / | 1.30 | 1.50 | V |
| | | $I_F = 10\text{A}$, $T_j = 175^\circ\text{C}$ | / | 1.55 | 1.80 | |
| I_R | Reverse current | $V_R = 650\text{V}$, $T_j = 25^\circ\text{C}$ | / | 1 | 30 | μA |
| | | $V_R = 650\text{V}$, $T_j = 175^\circ\text{C}$ | / | 3 | 80 | |

1.9. Dynamic Electrical Characteristics

(T_j = 25°C, unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------|---------------------------|---------------------------------|------|------|------|------|
| C | Total capacitance | V _R = 0V, f = 1MHz | / | 556 | / | pF |
| | | V _R = 200V, f = 1MHz | / | 55 | / | |
| | | V _R = 400V, f = 1MHz | / | 45 | / | |
| Q _C | Total capacitive charge | V _R = 400V | / | 29 | / | nC |
| E _C | Capacitance stored energy | V _R = 400V | / | 4.3 | / | μJ |

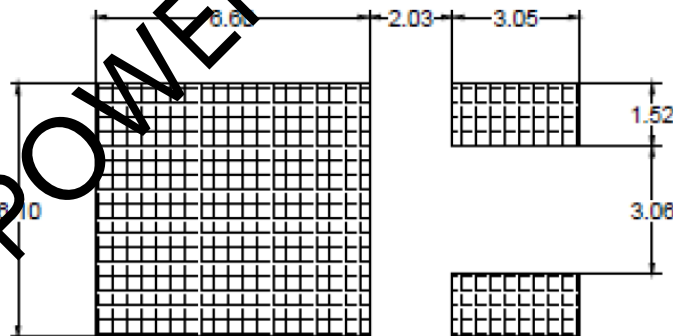
2. Package Information



| Dimension unit: [mm] | | | |
|----------------------|-----------|-------|-------|
| Symbol | Min | Nom | Max |
| A | 2.20 | 2.30 | 2.38 |
| A1 | 0 | - | 0.127 |
| A2 | 0.97 | 1.07 | 1.17 |
| b | 0.68 | 0.78 | 0.90 |
| b1 | 5.20 | 5.33 | 5.46 |
| c | 0.43 | 0.53 | 0.61 |
| D | 5.98 | 6.10 | 6.22 |
| D1 | 5.30 REF | | |
| E | 6.40 | 6.60 | 6.73 |
| E1 | 4.63 | - | - |
| e | 2.286 BSC | | |
| H | 9.40 | 10.10 | 10.50 |
| L | 1.38 | 1.50 | 1.75 |
| L1 | 2.743 REF | | |
| L2 | 0.51 BSC | | |
| L3 | 0.88 | - | 1.28 |
| L4 | 0.50 | - | 1.60 |
| θ | 0° | - | 8° |

3. Recommended Solder Pad Layout

All dimensions are in mm.



4. Ordering Information

| | |
|---------------|-------------|
| Part Number | JP065010D3 |
| Package | TO-252-2L |
| Unit Quantity | 2500 EA |
| Packing Type | Tape & Reel |

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