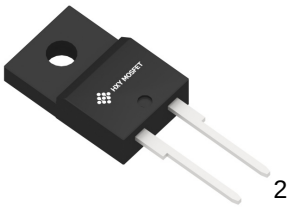
# BYV10EX-600PQ

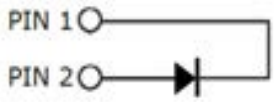
Silicon Carbide Schottky Diode

## Features

- 650-Volt Schottky Rectifier
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on $V_F$




TO-220F-2L




## Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

## Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives

| Part Number | Package | Qty(PCS) |
|---|---|---|
| BYV10EX-600PQ | TO-220F-2L | 50 |

## Maximum Ratings ($T_C$ = 25 ˚C unless otherwise specified)

| Symbol | Parameter | Value | Unit | Test Conditions |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive Peak Reverse Voltage | 650 | V | |
| $V_{RSM}$ | Surge Peak Reverse Voltage | 650 | V | |
| $I_F$ | Continuous Forward Current | 22.2<br>11.4<br>10 | A | $T_C$=25˚C<br>$T_C$=125˚C<br>$T_C$=134.5˚C |
| $I_{FRM}$ | Repetitive Peak Forward Surge Current | 30 | A | $T_C$=25˚C, $t_P$ = 10 ms, Half Sine Wave |
| $I_{FSM}$ | Non-Repetitive Peak Forward Surge Current | 80 | A | $T_C$=25˚C, $t_p$ = 10 ms, Half Sine Wave |
| $P_{tot}$ | Power Dissipation | 63<br>27 | W | $T_C$=25˚C<br>$T_C$=110˚C |
| $T_J$ , $T_{stg}$ | Operating Junction and Storage Temperature | -55 to +175 | ˚C | |
| | Mounting Torque | 1 | Nm | M3 Screw |
| $\int i^2dt$ | i²dt value | 32 | $A^2s$ | $T_C$=25˚C, $t_p$ = 10 ms, Half Sine Wave |

## Electrical Characteristics

| Symbol | Parameter | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| $V_{DC}$ | DC Blocking Voltage | 650 | | | V | |
| $V_F$ | Forward Voltage | | 1.37<br>1.74 | 1.7<br>2.5 | V | $I_F$ = 10A $T_J$=25°C<br>$I_F$ = 10A $T_J$=175°C |
| $I_R$ | Reverse Current | | 0.2<br>2 | 50<br>100 | μA | $V_R$ = 650 V $T_J$=25°C<br>$V_R$ = 650 V $T_J$=175°C |
| $Q_C$ | Total Capacitive Charge | | 28 | | nC | $V_R$ = 400 V $T_J$ = 25°C |
| C | Total Capacitance | | 536<br>55<br>53 | | pF | $V_R$ = 0 V, $T_J$ = 25°C, f = 1 MHz<br>$V_R$ = 200 V, $T_J$ = 25°C, f = 1 MHz<br>$V_R$ = 400 V, $T_J$ = 25°C, f = 1 MHz |
| $E_C$ | Capacitance Stored Energy | | 6.8 | | μJ | $V_R$ = 400 V |

## Thermal Characteristics

| Symbol | Parameter | Typ. | Unit |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | 2.37 | °C/W |

## Typical Performance

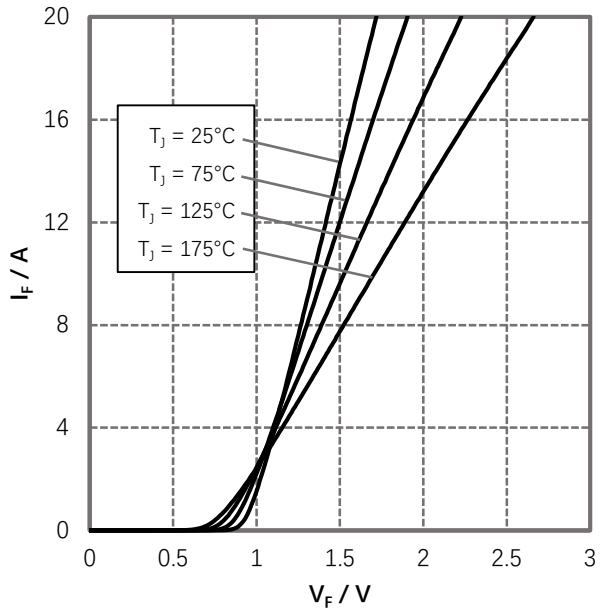



Figure 1. Forward Characteristics

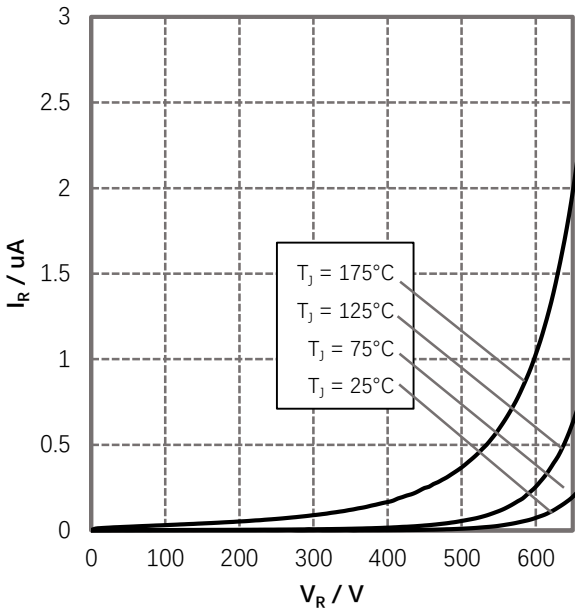



Figure 2. Reverse Characteristics

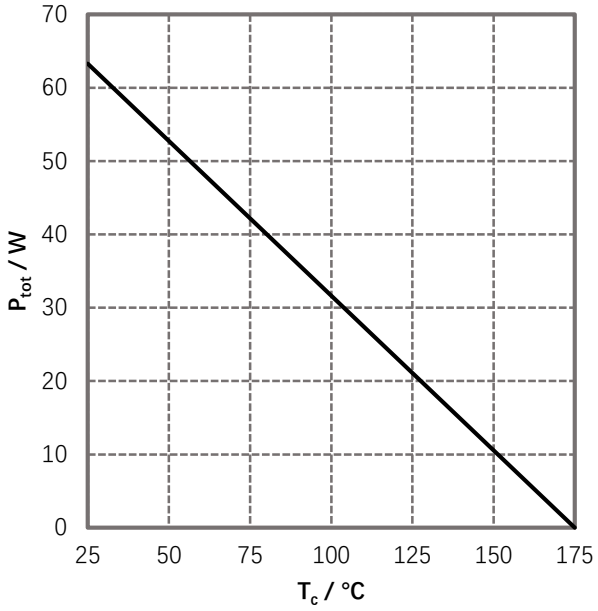



Figure 3. Power Derating

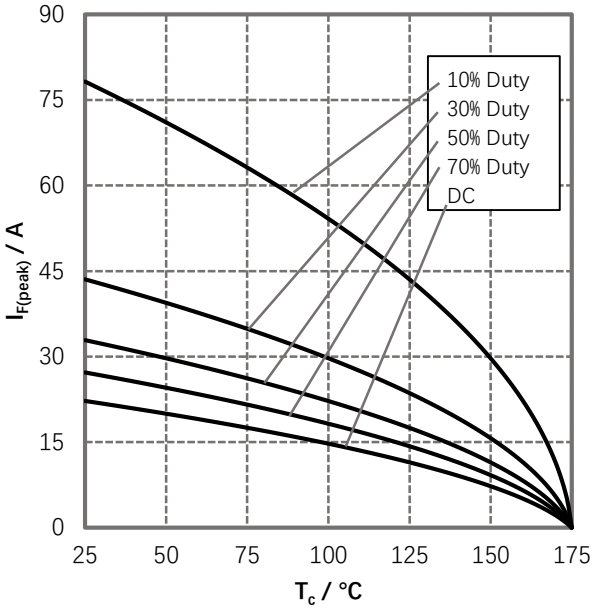



Figure 4. Current Derating

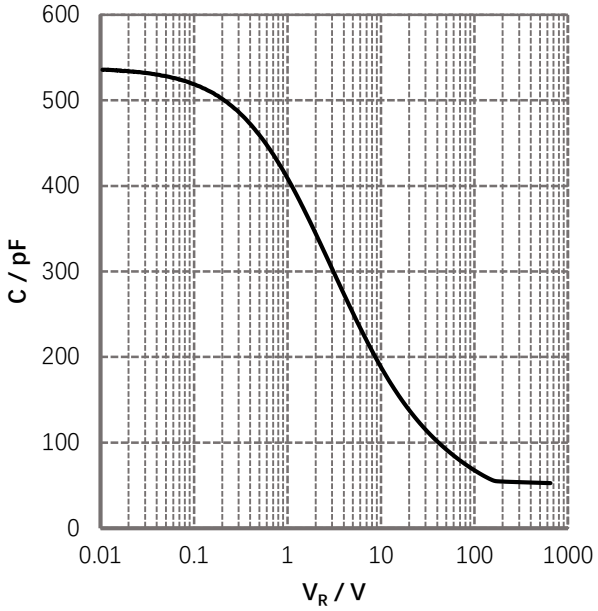



Figure 5. Capacitance vs. Reverse Voltage

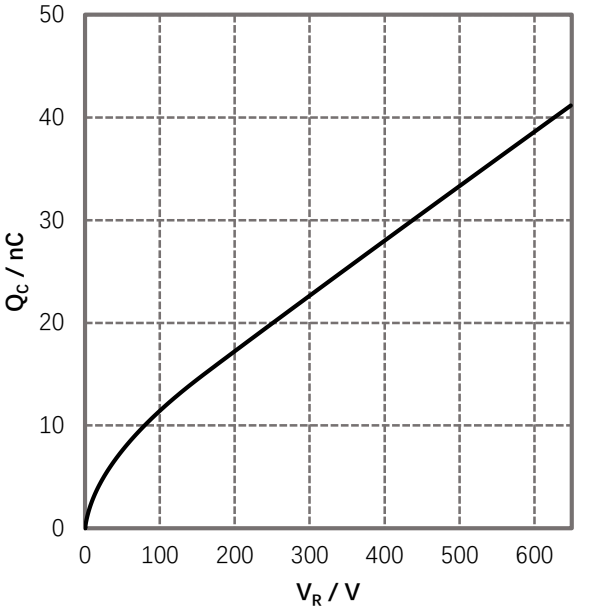



Figure 6. Total Capacitance Charge vs. Reverse Voltage

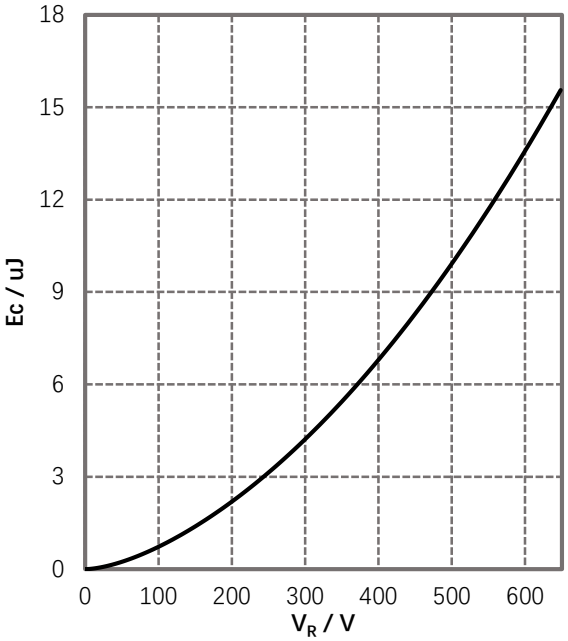



Figure 7. Capacitance Stored Energy

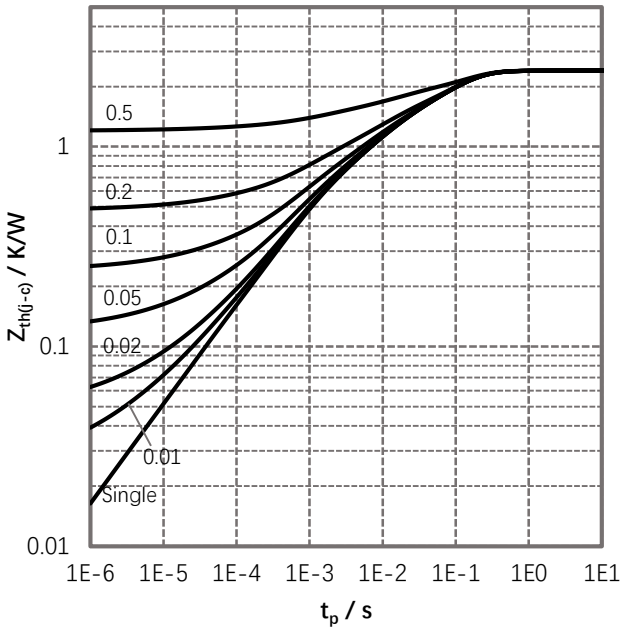
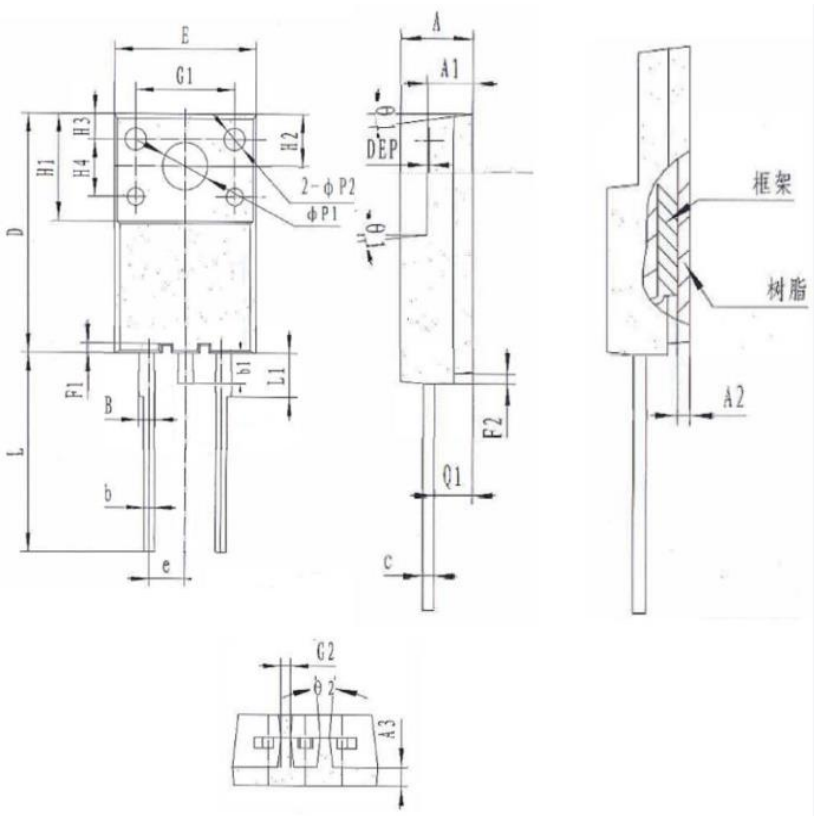



Figure 8. Transient Thermal Impedance

## Package Information
## TO-220F-2L




| 项目 | 规范(mm) | |
|---|---|---|
| | MIN | MAX |
| A | 4.30 | 4.70 |
| A1 | 2.68 | 2.88 |
| A2 | 0.55 | 0.65 |
| A3 | 0.86 | 1.06 |
| b | 0.77 | 0.87 |
| b1 | 0.60 | 0.80 |
| B | 1.07 | 1.25 |
| c | 0.45 | 0.55 |
| D | 15.70 | 16.10 |
| E | 9.90 | 10.22 |
| F1 | 0.40 | 0.60 |
| F2 | 0.50 | 0.70 |
| G1 | 6.90 | 7.10 |
| G2 | 0.60 | 0.70 |
| H1 | 6.80 | 7.20 |
| H2 | 3.25 | 3.45 |
| H3 | 1.50 | 1.90 |
| H4 | 3.65 | 4.05 |
| e | 2.49 | 2.59 |
| L | 13.00 | 13.60 |
| L1 | 3.20 | 3.40 |
| Q1 | 2.20 | 2.40 |
| θ1 | 4° | 10° |
| θ2 | 7° | 13° |
| ϕP1 | 3.06 | 3.26 |
| ϕP2 | 1.40 | 1.60 |
| DEP | 0.05 | 0.20 |

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