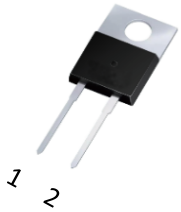
CLASSIC CHIP

# CC3D05120A

## Silicon Carbide Schottky Diode

| | | |
|---|---|---|
| $V_{RRM}$ | = | 1200 V |
| $I_F$ ( Tc=158 ℃) | = | 5 A |
| $Q_c$ | = | 37 nC |




TO-220-2


## Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

## Benefits

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

## Applications

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

## Maximum Ratings （Tc = 25 ℃ unless otherwise specified）

| Symbol | Parameter | Value | Unit | Test Conditions | Note |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive Peak Reverse Voltage | 1200 | V | | |
| $V_{RSM}$ | Surge Peak Reverse Voltage | 1300 | V | | |
| $V_R$ | DC Peak Reverse Voltage | 1200 | V | | |
| $I_F$ | Continuous Forward Current | 20<br>9.7<br>5 | A | Tc=25 ℃<br>Tc=135 ℃<br>Tc=158 ℃ | Fig. 3 |
| $I_{FSM}$ | Non-Repetitive Forward Surge Current | 55 | A | Tc=25 ℃，tp=10 ms，Half Sine Pulse | |
| $P_{tot}$ | Power Dissipation | 117<br>51 | W | Tc=25 ℃<br>Tc=110 ℃ | Fig. 4 |
| $T_J$ | Operating Junction Range | -55 to +175 | ℃ | | |
| $T_{stg}$ | Storage Temperature Range | -55 to +175 | ℃ | | |

## Electrical Characteristics

| Symbol | Parameter | Typ. | Max. | Unit | Test Conditions | Note |
|---|---|---|---|---|---|---|
| $V_F$ | Forward Voltage | 1.38<br>2 | 1.65<br>2.5 | V | $I_F$ = 5 A， $T_J$ = 25 ℃<br>$I_F$ = 5 A， $T_J$ = 175 ℃ | Fig. 1 |
| $I_R$ | Reverse Current | 2<br>11 | 50<br>200 | μA | $V_R$ = 1200 V， $T_J$ = 25 ℃<br>$V_R$ = 1200 V， $T_J$ = 175 ℃ | Fig. 2 |
| $Q_c$ | Total Capacitive Charge | 37 | | nC | $V_R$ = 800 V， $I_F$ = 5 A，<br>$T_J$ = 25 ℃ | Fig. 6 |
| C | Total Capacitance | 410<br>36<br>26 | | pF | $V_R$ = 0 V， $T_J$ = 25 ℃， f = 1 MHz<br>$V_R$ = 400 V， $T_J$ = 25 ℃， f = 1 MHz<br>$V_R$ = 800 V， $T_J$ = 25 ℃， f = 1 MHz | Fig. 5 |
| $E_C$ | Capacitance Stored Energy | 9.5 | | μJ | $V_R$ = 800 V | Fig. 7 |

Note：This is a majority carrier diode, so there is no reverse recovery charge.

## Thermal Characteristics

| Symbol | Parameter | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | | 1.28 | | ℃/W | Fig. 8 |

## Typical Performance

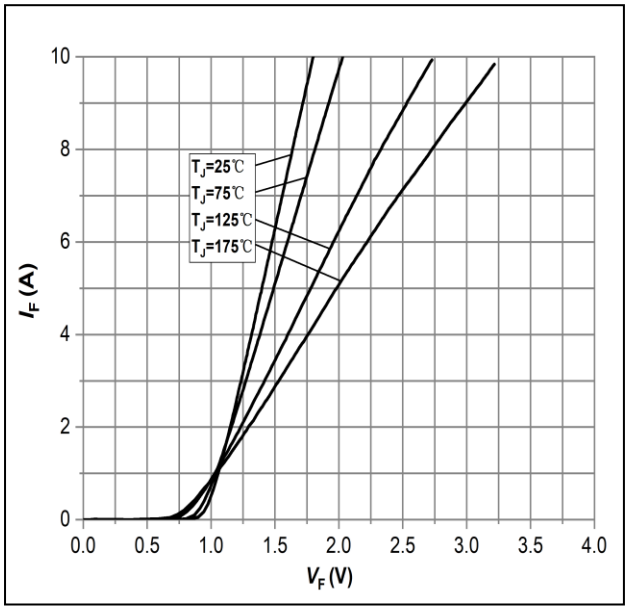



Figure 1: Forward Characteristics

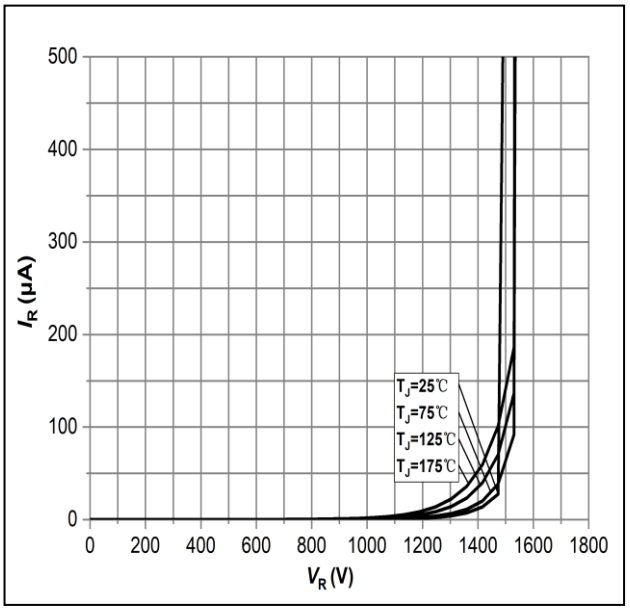



Figure 2: Reverse Characteristics

## Typical Performance

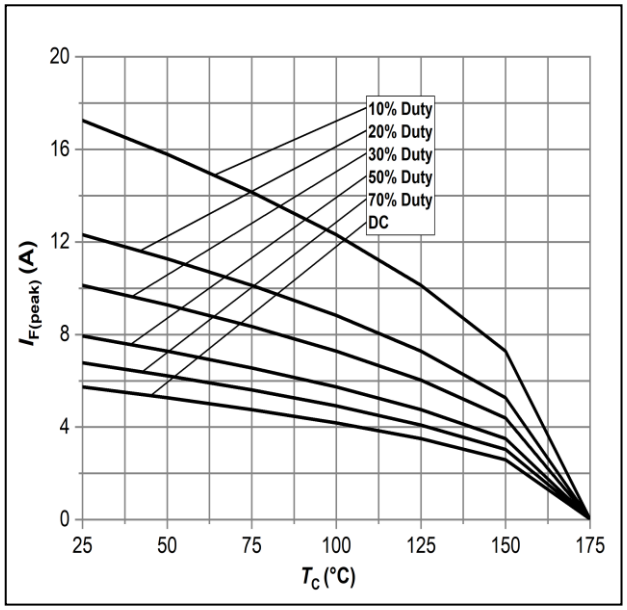



Figure 3: Current Derating

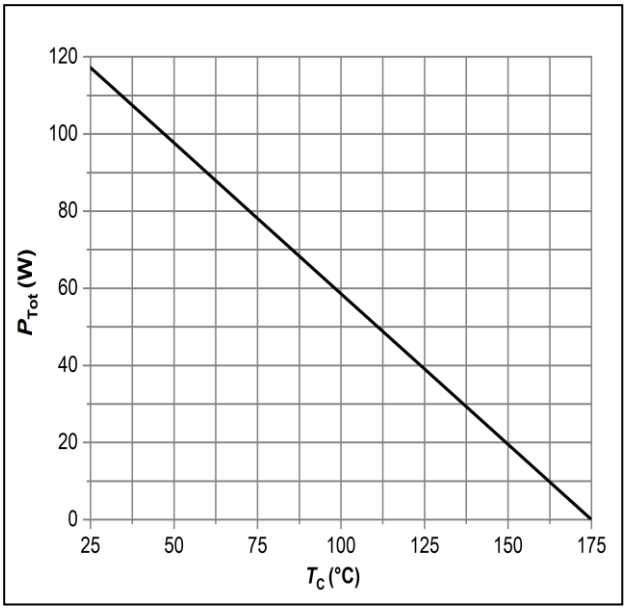



Figure 4: Power Derating

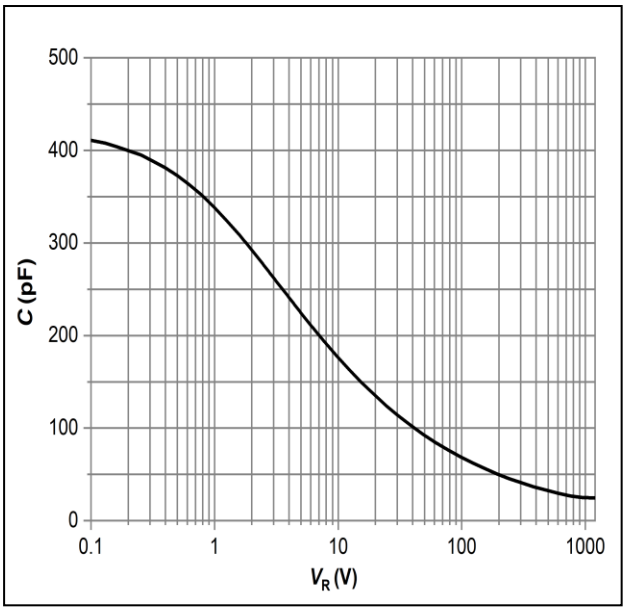



Figure 5: Capacitance vs. Reverse Voltage

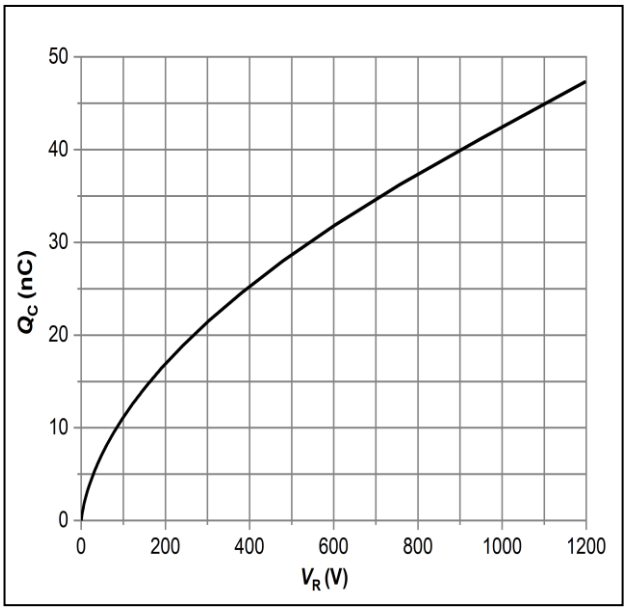



Figure 6: Total Capacitance Charge vs. Reverse Voltage

## Typical Performance

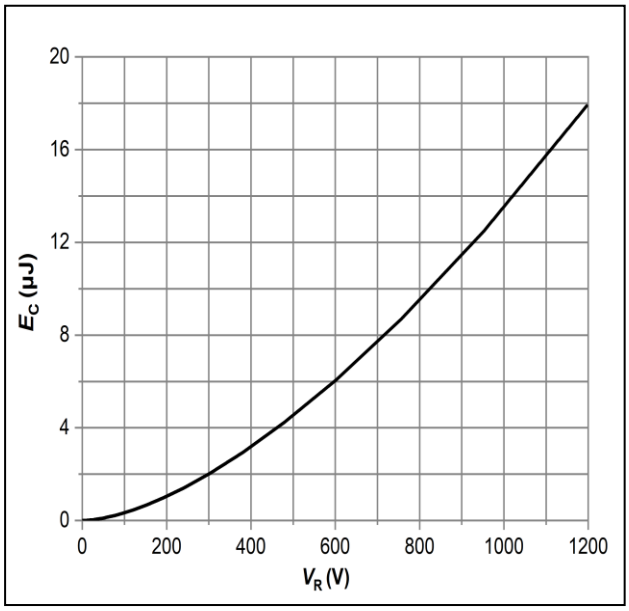



Figure 7:Typical Capacitance Stored Energy

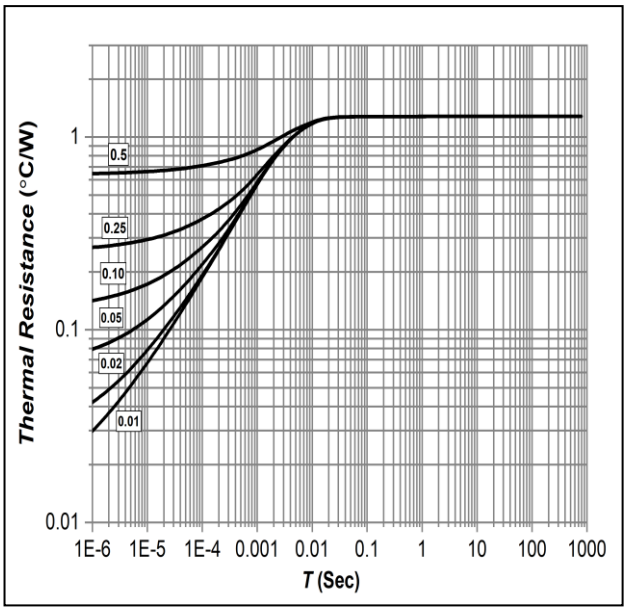
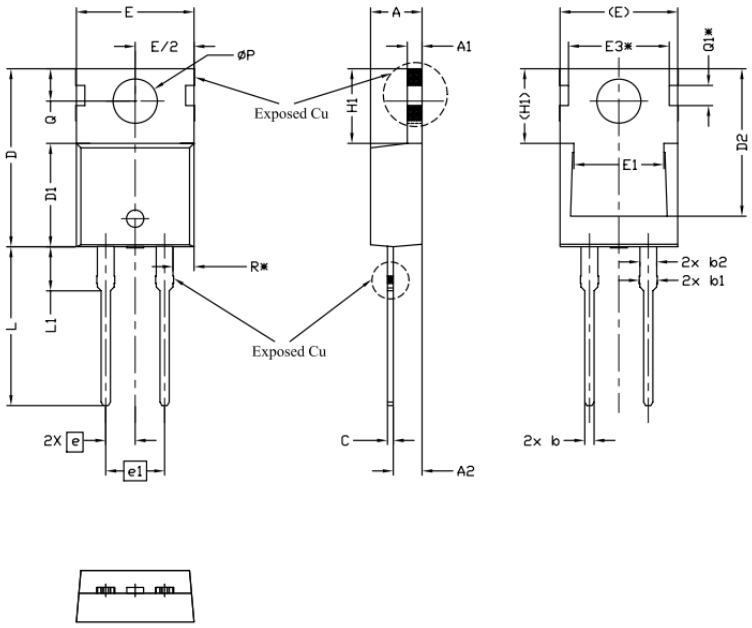



Figure 8: Transient Thermal Impedance

## Package Dimensions

Package： TO-220-2




| SYMBOL | DIMENSIONS | | | NOTES |
|---|---|---|---|---|
| | Min. | NOM | Max. | |
| A | 4.24 | 4.44 | 4.64 | |
| A1 | 1.15 | 1.27 | 1.40 | |
| A2 | 2.30 | 2.48 | 2.70 | |
| b | 0.70 | 0.80 | 0.90 | |
| b1 | 1.20 | 1.55 | 1.75 | |
| b2 | 1.20 | 1.45 | 1.70 | |
| c | 0.40 | 0.50 | 0.60 | |
| D | 14.70 | 15.37 | 16.00 | 4 |
| D1 | 8.82 | 8.92 | 9.02 | |
| D2 | 12.43 | 12.73 | 12.83 | 5 |
| E | 9.96 | 10.16 | 10.36 | 4.5 |
| E1 | 6.86 | 7.77 | 8.89 | 5 |
| E3* | 8.70 REF | | | |
| e | 2.54 BSC | | | |
| e1 | 5.08 BSC | | | |
| H1 | 6.30 | 6.45 | 6.60 | 5.6 |
| L | 13.47 | 13.72 | 13.97 | |
| L1 | 3.60 | 3.80 | 4.00 | |
| ØP | 3.75 | 3.84 | 3.93 | |
| Q | 2.60 | 2.80 | 3.00 | |
| Q1* | 1.73 REF | | | |
| R* | 1.82 REF | | | |

NOTE : Dimension L, M, W apply for Solder Dip Finish