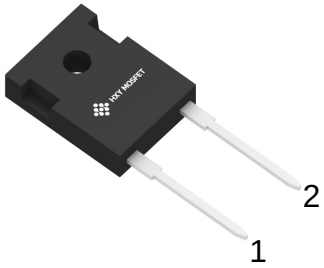
# FFSH5065B-F085

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-247-2L




## 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) |
|---|---|---|
| FFSH5065B-F085 | TO-247-2L | 30 |

## 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 | 118.3<br>53.6<br>50 | A | $T_C$=25˚C<br>$T_C$=135˚C<br>$T_C$=139.5˚C |
| $I_{FRM}$ | Repetitive Peak Forward Surge Current | 180 | A | $T_C$=25˚C, $t_P$ = 10 ms, Half Sine Wave |
| $I_{FSM}$ | Non-Repetitive Peak Forward Surge Current | 360 | A | $T_C$=25˚C, $t_p$ = 10 ms, Half Sine Wave |
| $P_{tot}$ | Power Dissipation | 375<br>163 | W | $T_C$=25˚C<br>$T_C$=110˚C |
| $T_J$ , $T_{stg}$ | Operating Junction and Storage Temperature | -55 to +175 | ˚C | |
| | TO-220 Mounting Torque | 1 | Nm | M3 Screw |
| $\int i^2dt$ | $i^2dt$ value | 648 | $A^2s$ | $T_C$=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 | | 1.47<br>1.80 | 1.7<br>2.5 | V | $I_F$ = 50 A $T_J$=25°C<br>$I_F$ = 50 A $T_J$=175°C |
| $I_R$ | Reverse Current | | 2<br>8.7 | 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 | | 158 | | nC | $V_R$ = 400 V $T_J$ = 25°C |
| C | Total Capacitance | | 3051<br>310<br>303 | | 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 | | 38 | | μJ | $V_R$ = 400 V |

## Thermal Characteristics

| Symbol | Parameter | Typ. | Unit |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | 0.4 | °C/W |

## Typical Performance

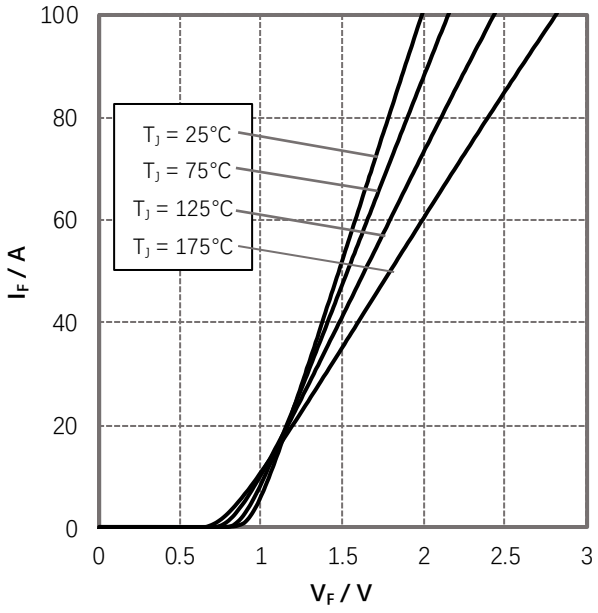



Figure 1. Forward Characteristics

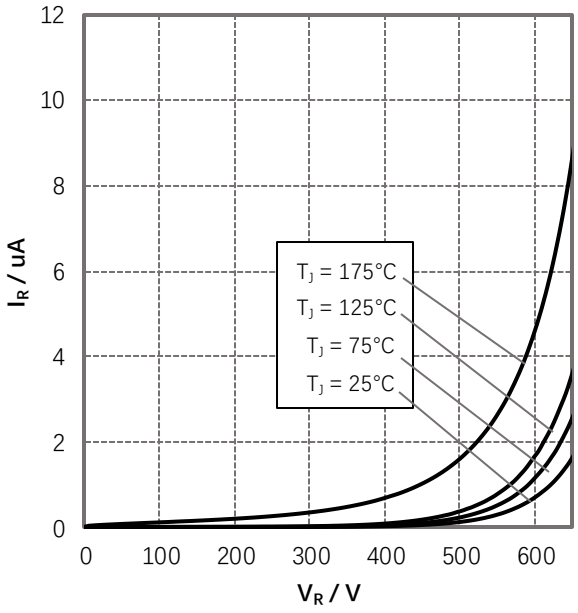



Figure 2. Reverse Characteristics

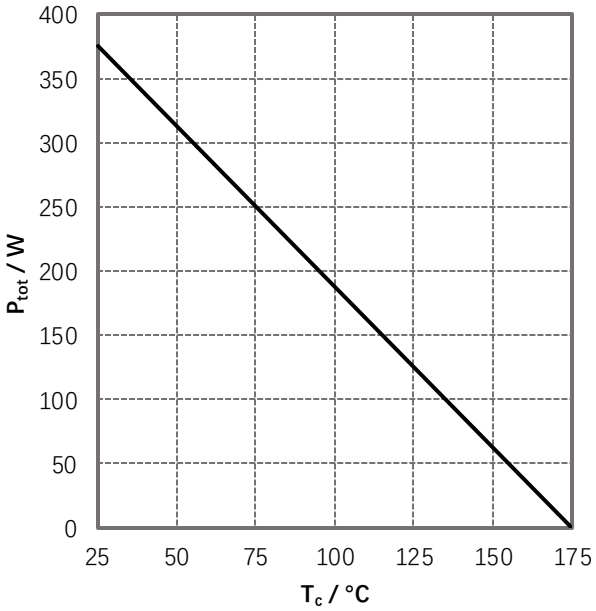



Figure 3. Power Derating

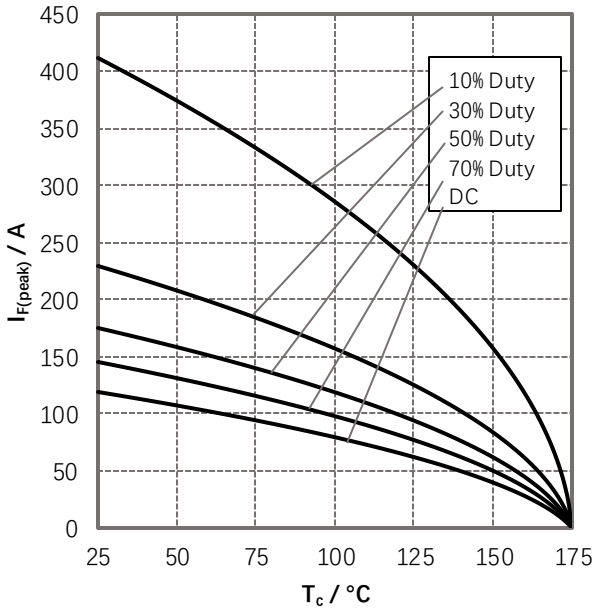



Figure 4. Current Derating

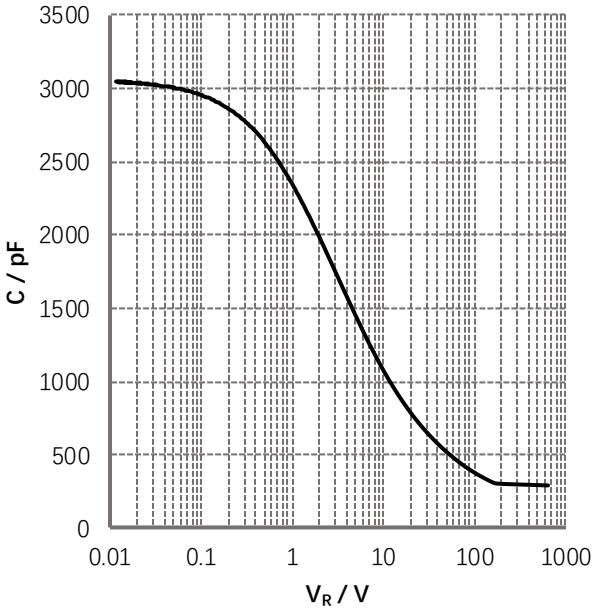



Figure 5. Capacitance vs. Reverse Voltage

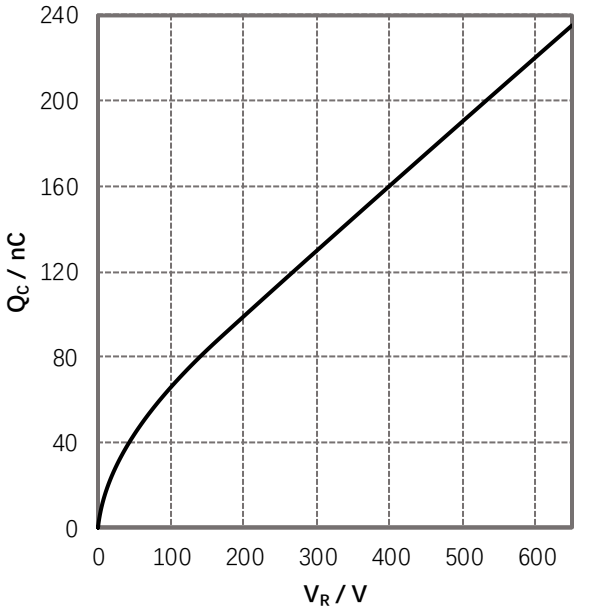



Figure 6. Total Capacitance Charge vs. Reverse Voltage

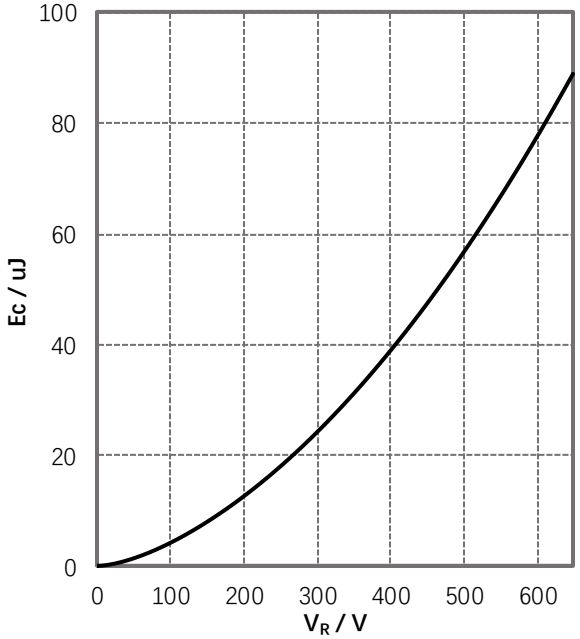



Figure 7. Capacitance Stored Energy

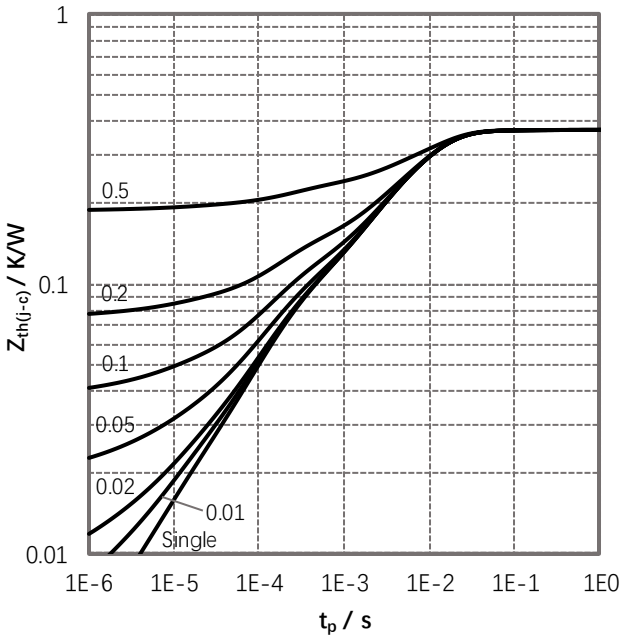
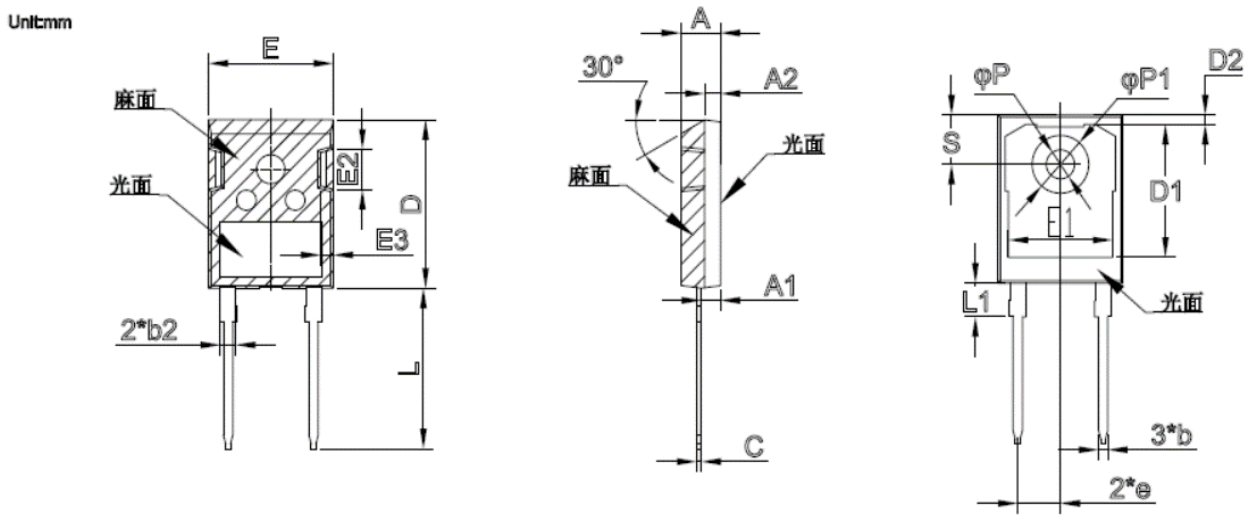



Figure 8. Transient Thermal Impedance

## Package Information
## TO-247-2L

Unit:mm




| | Min | Nom | Max | | Min | Nom | Max |
|---|---|---|---|---|---|---|---|
| A | 4.70 | 5.00 | 5.20 | E1 | 13.06 | 13.26 | 13.56 |
| A1 | 2.30 | | 2.50 | E2 | 4.90 | 5.00 | 5.10 |
| A2 | 1.90 | 2.00 | 2.10 | E3 | 1.50 | 1.60 | 1.70 |
| b | 1.10 | 1.20 | 1.30 | e | 5.34 | 5.44 | 5.54 |
| b2 | | 2.00 | | L | 19.80 | 20.00 | 20.32 |
| | | | | L1 | | 4.17 | 4.50 |
| C | 0.5 | 0.6 | 0.7 | P | 3.50 | 3.60 | 3.70 |
| D | 20.8 | 20.95 | 21.1 | P1 | 7.00 | 7.19 | 7.40 |
| D1 | | 16.55 | | S | 6.04 | 6.15 | 6.3 |
| D2 | 0.95 | 1.17 | 1.35 | | | | |
| E | 15.48 | 15.88 | 16.28 | | | | |
| | | | | | | | |

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## HXY MOSFET:

ESD5L5.0C-HXY HAZ4007-01H PESDSC2FD5VU 60N06 HRCLAMP3371ZCTFT PJEC5V0M1FN2
HESD36VD3B HESDSLC3V3D3B PESDNC2XD5VBL RLSD32A121V AZ4007-01H ESD5LM5.0C-HXY
HACPDQC5V0-HF HPTVSUC3D5VB HSG3D15B3.3MA LM393DR-HXY AZ4836-01L HLY323BC1524L
HSEN2411D3 PESDNC2XD5VBF HCEZ36V,L3F PJSD24CW_R1 TPSMB100CA-VR BV05C-H
HSD15C.TCT HSTS521050B331 PESDLC2FD3V3BH AQ15C-01FTG HSEN3611D3 TPSMB28A-VR