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# Silicon Carbide Schottky Diode

## 650 V, 10 A

# FFSM1065B

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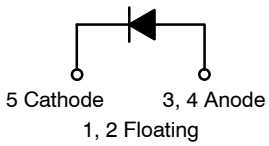
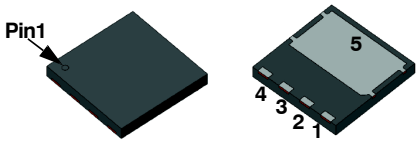
| $V_{RRM}$ | $I_F$ |
|---|---|
| 650 V | 10 A |




**Schottky Diode**




**PQFN 8×8, 2P**
**CASE 483AP**

### Description

Silicon Carbide (SiC) Schottky Diodes use a completely new technology that provides superior switching performance and higher reliability compared to Silicon. No reverse recovery current, temperature independent switching characteristics, and excellent thermal performance sets Silicon Carbide as the next generation of power semiconductor. System benefits include highest efficiency, faster operating frequency, increased power density, reduced EMI, and reduced system size & cost.

### Features

- Max Junction Temperature 175°C
- Avalanche Rated 49 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery/No Forward Recovery
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

### Applications

- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

### MAXIMUM RATINGS ($T_C$ = 25°C unless otherwise noted)

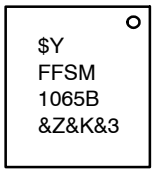
| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Peak Repetitive Reverse Voltage | | $V_{RRM}$ | 650 | V |
| Single Pulse Avalanche Energy (starting $T_J$ = 25°C, $I_{AS}$ = 14 A, L = 0.5 mH, V = 50 V) | | $E_{AS}$ | 49 | mJ |
| Continuous Rectified Forward Current | $T_C$ < 150 | $I_F$ | 10 | A |
| | $T_C$ < 135 | | 13.5 | |
| Non−Repetitive Peak Forward Surge Current ($t_P$ = 10 μs) | $T_C$ = 25°C | $I_{FM}$ | 532 | A |
| | $T_C$ = 150°C | | 468 | |
| Non−Repetitive Forward Surge Current (Half−Sine Pulse) | $T_C$ = 25°C, $t_P$ = 8.3 ms | $I_{FSM}$ | 42 | A |
| Power Dissipation | $T_C$ = 25°C | $P_{tot}$ | 98 | W |
| | $T_C$ = 150°C | | 16 | |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | −55 to +175 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL RESISTANCE

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction−to−Case, Max | $R_{\theta JC}$ | 1.53 | °C/W |

### MARKING DIAGRAM




| | |
|---|---|
| $Y | = ON Semiconductor Logo |
| &Z | = Assembly Plant Code |
| &K | = Lot Code |
| &3 | = Numeric Date Code |
| FFSM1065B | = Specific Device Code |

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

**ELECTRICAL CHARACTERISTICS** ($T_J$ = 25°C unless otherwise noted)

| Symbol | Parameter | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_F$ | Forward Voltage | $I_F$ = 10 A, $T_J$ = 25°C | – | 1.38 | 1.7 | V |
| | | $I_F$ = 10 A, $T_J$ = 125°C | – | 1.6 | | |
| | | $I_F$ = 10 A, $T_J$ = 150°C | – | 1.67 | | |
| $I_R$ | Reverse Current | $V_R$ = 650 V, $T_J$ = 25°C | – | 0.5 | 40 | μA |
| | | $V_R$ = 650 V, $T_J$ = 125°C | – | 1 | 80 | |
| | | $V_R$ = 650 V, $T_J$ = 175°C | – | 2 | 160 | |
| $Q_C$ | Total Capacitive Charge | V = 400 V | – | 25 | – | nC |
| C | Total Capacitance | $V_R$ = 1 V, f = 100 kHz | – | 424 | – | pF |
| | | $V_R$ = 300 V, f = 100 kHz | – | 39 | – | |
| | | $V_R$ = 600 V, f = 100 kHz | – | 35 | – | |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

**ORDERING INFORMATION**

| Part Number | Top Marking | Package | Shipping* |
|---|---|---|---|
| FFSM1065B | FFSM1065B | PQFN 8X8, 2P<br>(Halogen Free) | 3000 Units / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D

## TYPICAL CHARACTERISTICS

($T_J$ = 25°C unless otherwise noted)

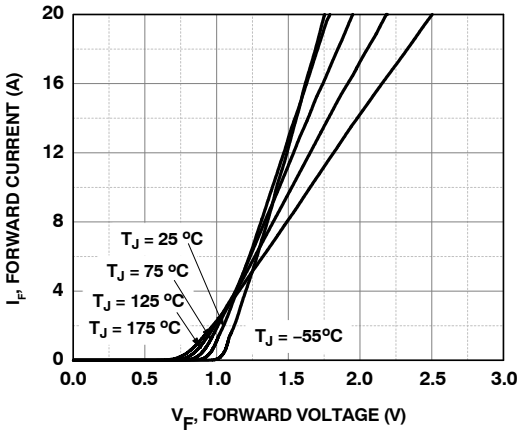



**Figure 1. Forward Characteristics**

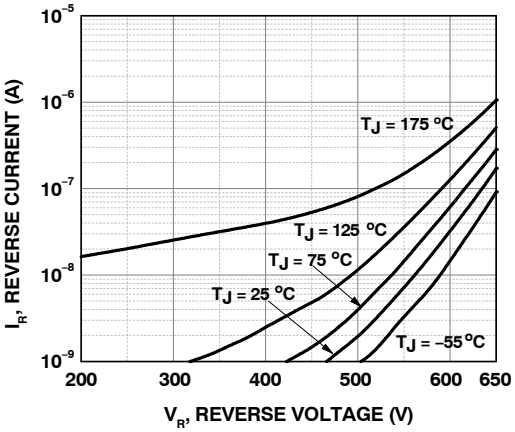



**Figure 2. Reverse Characteristics**

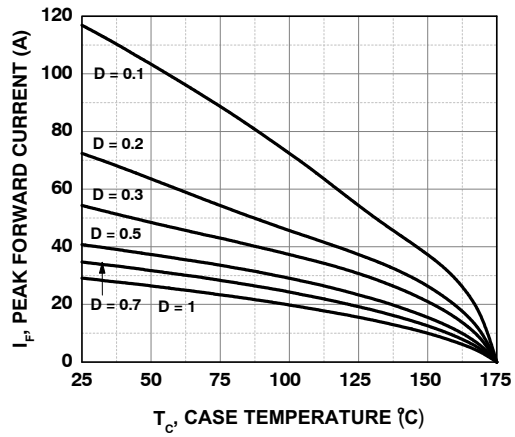



**Figure 3. Current Derating**

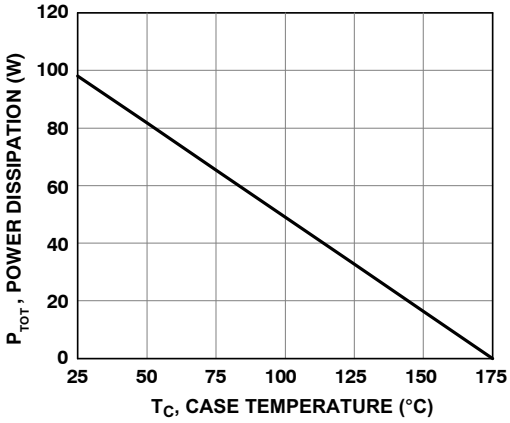



**Figure 4. Power Derating**

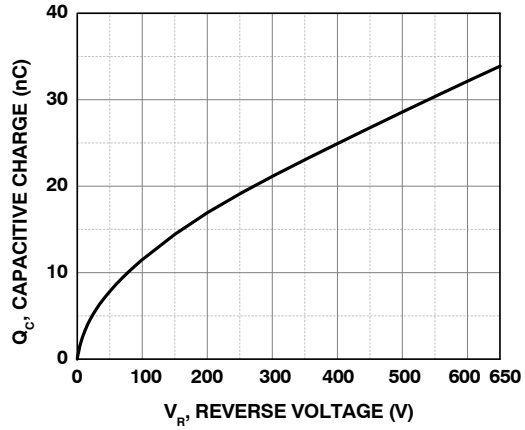



**Figure 5. Capacitive Charge vs. Reverse Voltage**

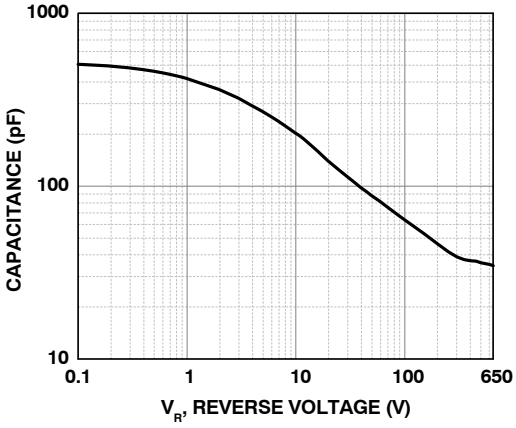



**Figure 6. Capacitance vs. Reverse Voltage**

## TYPICAL CHARACTERISTICS (continued)

($T_J$ = 25°C unless otherwise noted)

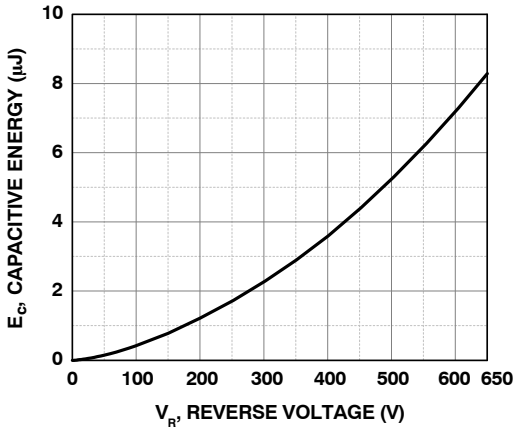



**Figure 7. Capacitance Stored Energy**

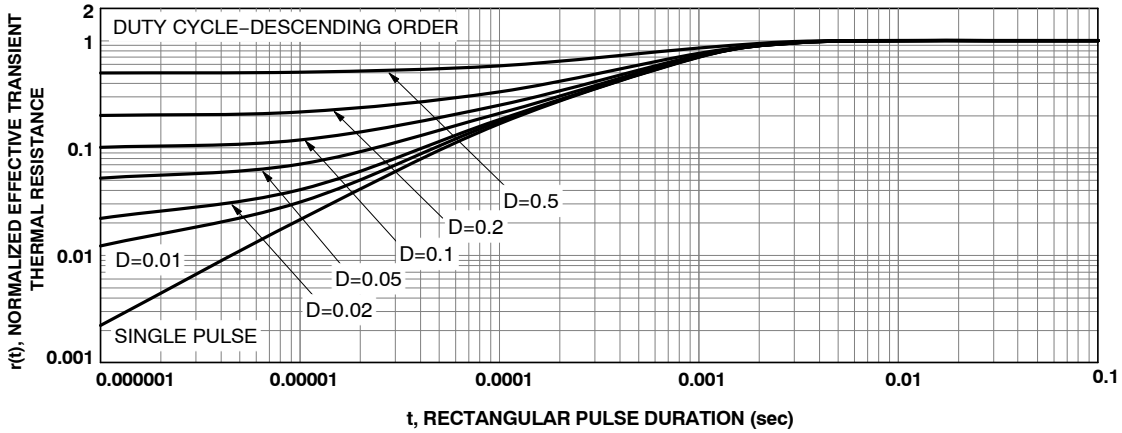
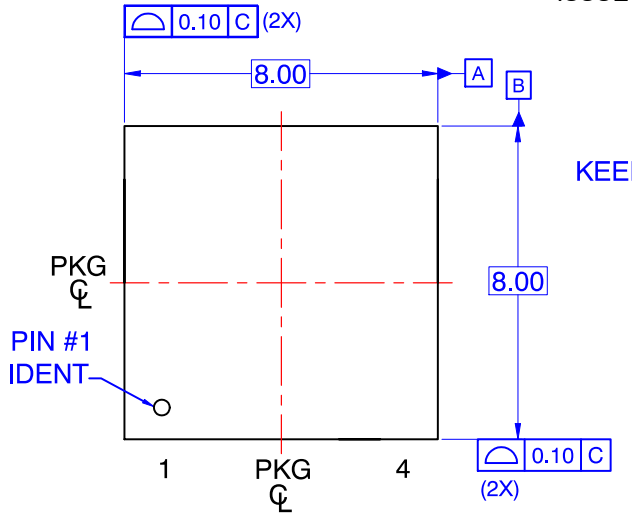


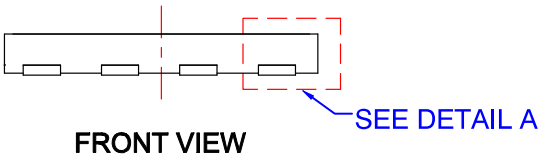

**Figure 8. Junction−to−Case Transient Thermal Response Curve**

## PACKAGE DIMENSIONS

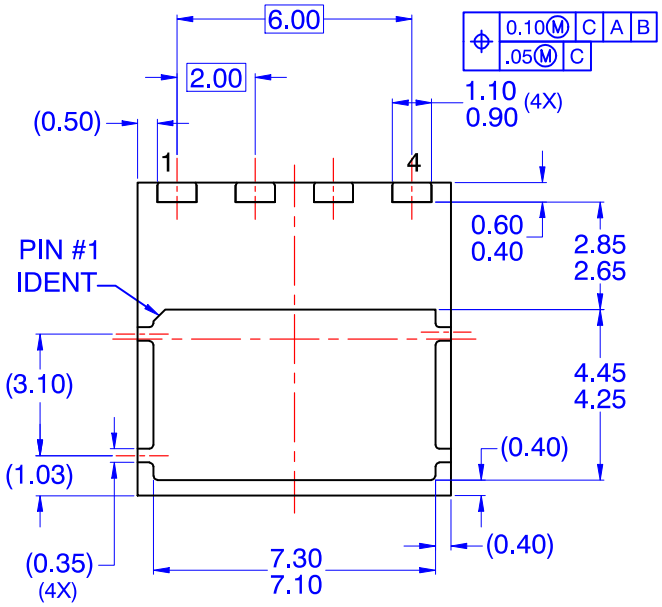
**PQFN4 8X8, 2P**
CASE 483AP
ISSUE O



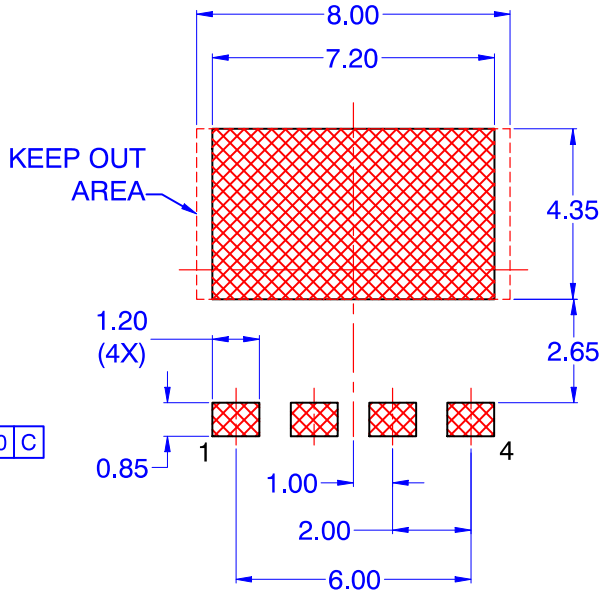

TOP VIEW



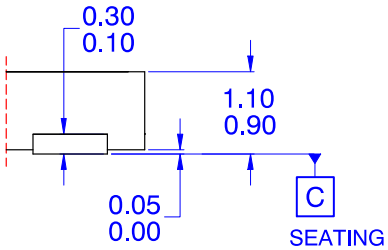

FRONT VIEW




BOTTOM VIEW




LAND PATTERN
RECOMMENDATION




DETAIL A
SCALE: 2X

NOTES: UNLESS OTHERWISE SPECIFIED
A) THIS PACKAGE IS NOT PRESENTLY REGISTERED WITH ANY STANDARDS COMMITTEE.
B) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS.
C) ALL DIMENSIONS ARE IN MILLIMETERS.
D) DRAWING CONFORMS TO ASME Y14.5M–1994.

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