

# Silicon Carbide (SiC) Schottky Diode – EliteSiC, 8 A, 650 V, D2, TO-220-2L

## FFSP0865B

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 and cost.

### Features

- Max Junction Temperature 175°C
- Avalanche Rated 33 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

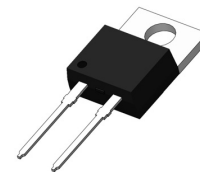
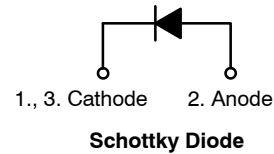
- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

### MAXIMUM RATINGS (T<sub>J</sub> = 25°C unless otherwise noted)s

| Parameter                                                                                                |                                                  | Symbol                            | Value       | Unit |
|----------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------|-------------|------|
| Peak Repetitive Reverse Voltage                                                                          |                                                  | V <sub>RRM</sub>                  | 650         | V    |
| Single Pulse Avalanche Energy (T <sub>J</sub> = 25°C, I <sub>L(pk)</sub> = 11.5 A, L = 0.5 mH, V = 50 V) |                                                  | E <sub>AS</sub>                   | 33          | mJ   |
| Continuous Rectified Forward Current                                                                     | @ T <sub>C</sub> < 147                           | I <sub>F</sub>                    | 8.0         | A    |
|                                                                                                          | @ T <sub>C</sub> < 135                           |                                   | 10.1        |      |
| Non-Repetitive Peak Forward Surge Current                                                                | T <sub>C</sub> = 25°C<br>t <sub>p</sub> = 10 μs  | I <sub>FM</sub>                   | 551         | A    |
|                                                                                                          | T <sub>C</sub> = 150°C<br>t <sub>p</sub> = 10 μs |                                   | 498         |      |
| Non-Repetitive Forward Surge Current (Half-Sine Pulse)                                                   | T <sub>C</sub> = 25°C<br>t <sub>p</sub> = 8.3 ms | I <sub>FSM</sub>                  | 56          | A    |
| Power Dissipation                                                                                        | T <sub>C</sub> = 25°C                            | P <sub>tot</sub>                  | 73          | W    |
|                                                                                                          | T <sub>C</sub> = 150°C                           |                                   | 12          |      |
| Operating Junction and Storage Temperature Range                                                         |                                                  | T <sub>J</sub> , T <sub>stg</sub> | -55 to +175 | °C   |

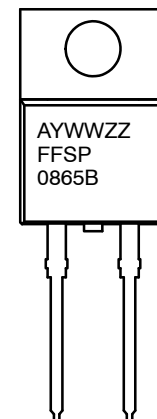
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

|                  |                |
|------------------|----------------|
| V <sub>RRM</sub> | I <sub>F</sub> |
| 650 V            | 8.0 A          |



TO-220-2LD  
CASE 340BB

### MARKING DIAGRAM



A = Assembly Plant Code  
 YWW = Date Code (Year & Week)  
 ZZ = Lot Code  
 FFSP0865B = Specific Device Code

### ORDERING INFORMATION

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

# FFSP0865B

## THERMAL CHARACTERISTICS

| Parameter                                  | Symbol          | Value | Unit                 |
|--------------------------------------------|-----------------|-------|----------------------|
| Thermal Resistance, Junction-to-Case, Max. | $R_{\theta JC}$ | 2.05  | $^{\circ}\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS ( $T_J = 25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|-----------|--------|-----------------|-----|-----|-----|------|
|-----------|--------|-----------------|-----|-----|-----|------|

### ON CHARACTERISTICS

|                 |       |                                                 |   |       |     |               |
|-----------------|-------|-------------------------------------------------|---|-------|-----|---------------|
| Forward Voltage | $V_F$ | $I_F = 8.0\text{ A}, T_J = 25^{\circ}\text{C}$  | – | 1.39  | 1.7 | V             |
|                 |       | $I_F = 8.0\text{ A}, T_J = 125^{\circ}\text{C}$ | – | 1.55  | 2.0 |               |
|                 |       | $I_F = 8.0\text{ A}, T_J = 175^{\circ}\text{C}$ | – | 1.71  | 2.4 |               |
| Reverse Current | $I_R$ | $V_R = 650\text{ V}, T_J = 25^{\circ}\text{C}$  | – | 0.073 | 40  | $\mu\text{A}$ |
|                 |       | $V_R = 650\text{ V}, T_J = 125^{\circ}\text{C}$ | – | 0.24  | 80  |               |
|                 |       | $V_R = 650\text{ V}, T_J = 175^{\circ}\text{C}$ | – | 0.48  | 160 |               |

### CHARGES, CAPACITANCES & GATE RESISTANCE

|                         |                  |                                          |   |     |   |    |
|-------------------------|------------------|------------------------------------------|---|-----|---|----|
| Total Capacitive Charge | $Q_C$            | $V_C = 400\text{ V}$                     | – | 22  | – | nC |
|                         | $C_{\text{tot}}$ | $V_R = 1\text{ V}, f = 100\text{ kHz}$   | – | 336 | – | pF |
|                         |                  | $V_R = 200\text{ V}, f = 100\text{ kHz}$ | – | 39  | – |    |
|                         |                  | $V_R = 400\text{ V}, f = 100\text{ kHz}$ | – | 30  | – |    |

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.

## PACKAGE MARKING AND ORDERING INFORMATION

| Part Number | Top Marking | Package   | Packing Method | Reel Size | Tape Width | Quantity |
|-------------|-------------|-----------|----------------|-----------|------------|----------|
| FFSP0865B   | FFSP0865B   | TO-220-2L | Tube           | N/A       | N/A        | 50 Units |

†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

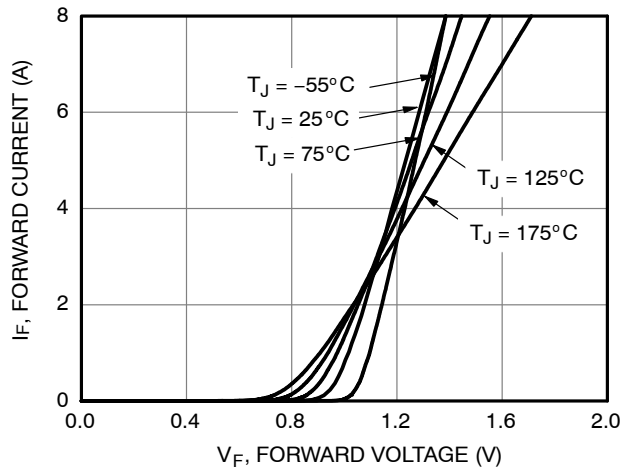


Figure 1. Forward Characteristics

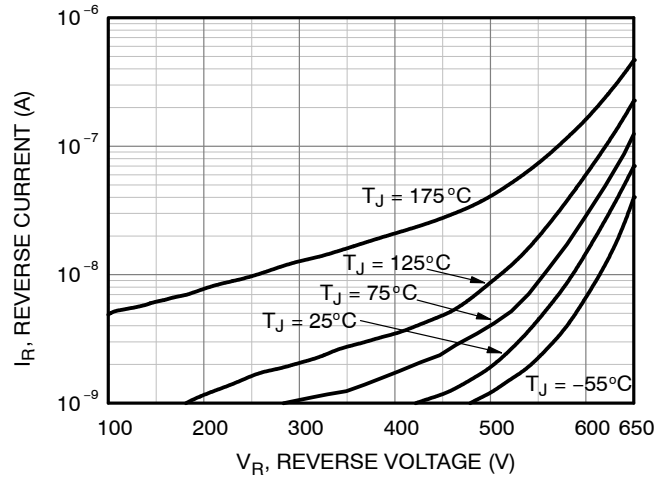


Figure 2. Reverse Characteristics

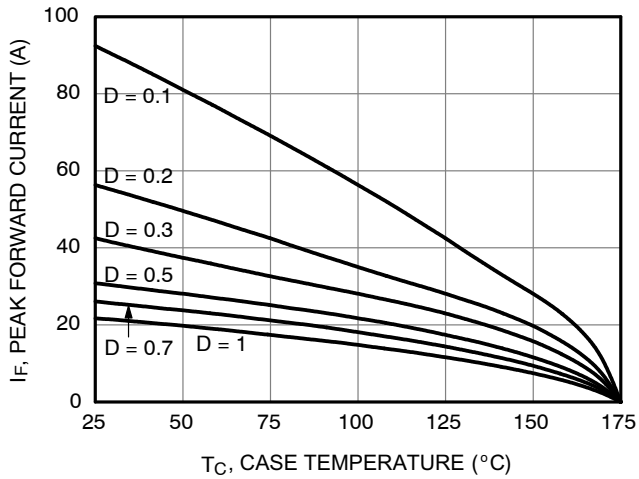


Figure 3. Current Derating

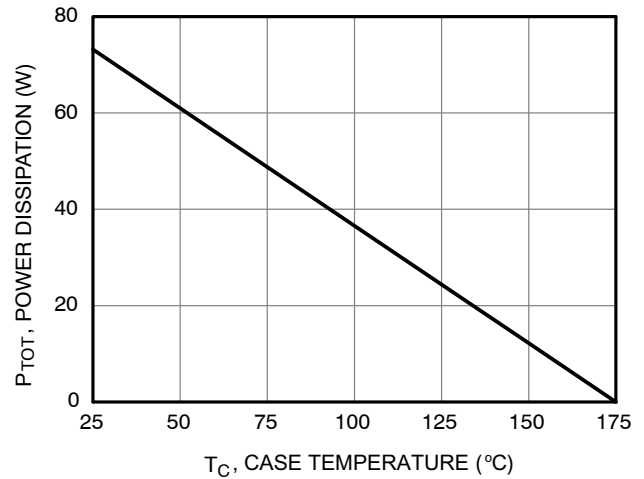


Figure 4. Power Derating

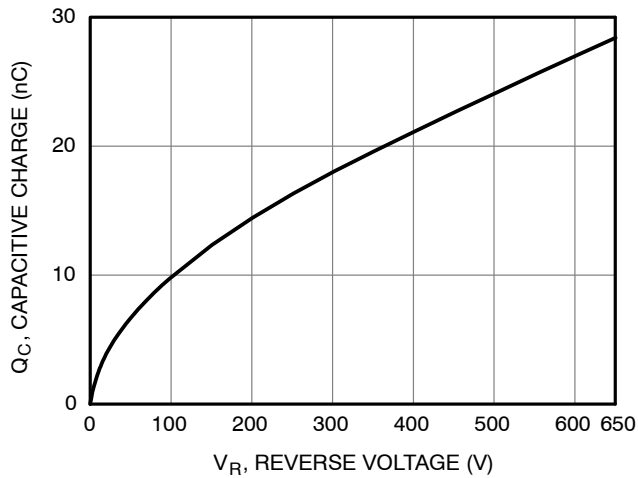


Figure 5. Capacitive Charge vs. Reverse Voltage

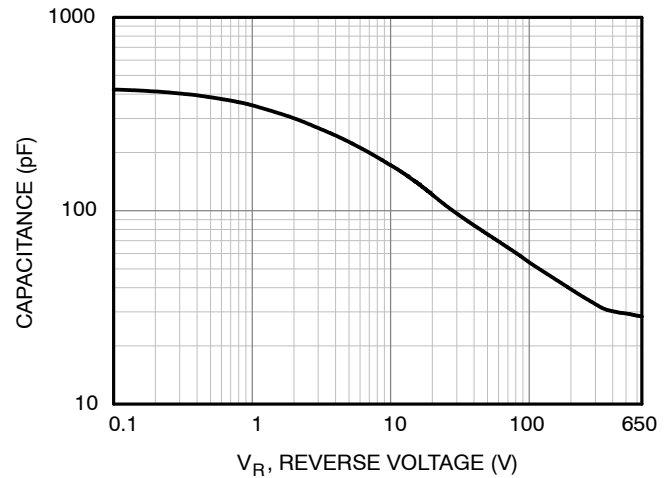


Figure 6. Capacitance vs. Reverse Voltage

## TYPICAL CHARACTERISTICS

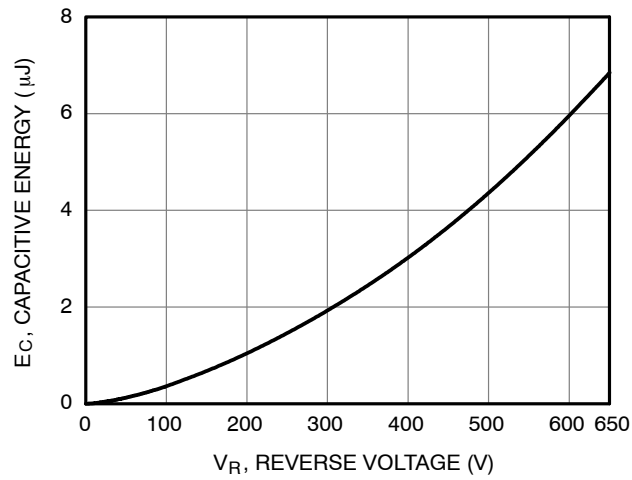


Figure 7. Capacitance Stored Energy

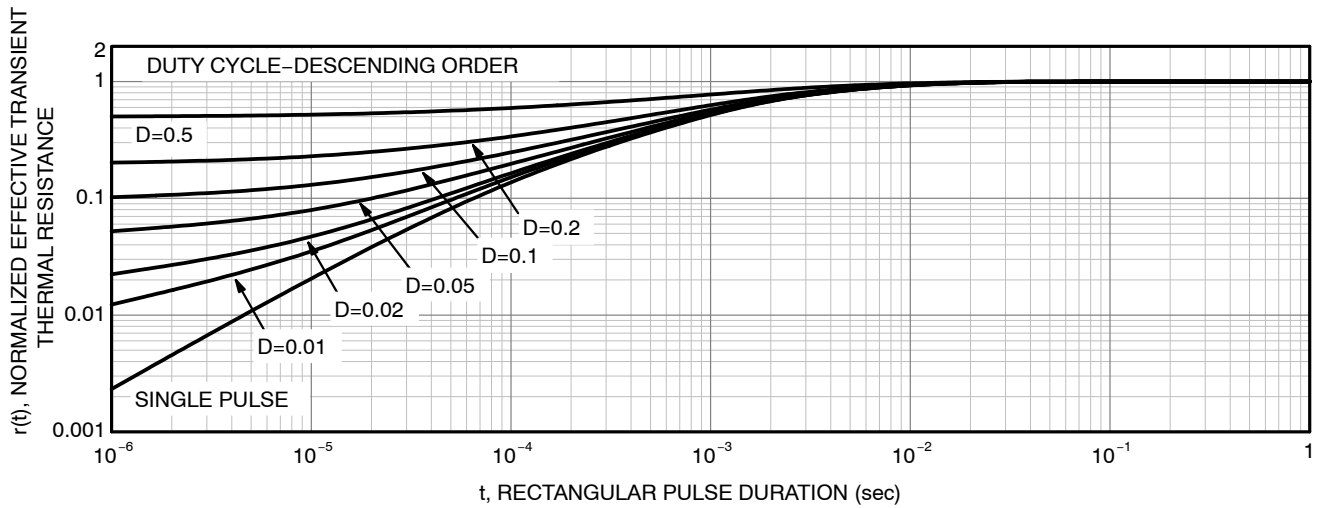


Figure 8. Junction-to-Case Transient Thermal Response

## DATE 31 AUG 2016



- A. PACKAGE REFERENCE: JEDEC TO220,ISSUE K,  
VARIATION AC,DATED APRIL 2002.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSION AND TOLERANCE AS PER ASME  
Y14.5-2009.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS,  
MOLD FLASH AND TIE BAR PROTRUSIONS.

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