

Silicon Carbide (SiC) Schottky Diode – EliteSiC, 6 A, 650 V, D2, DPAK

FFSD0665B-F085

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 24.5 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery
- AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

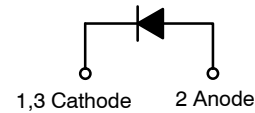
- Automotive HEV-EV Onboard Chargers
- Automotive HEV-EV DC-DC Converters

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

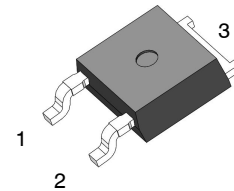
| Parameter | Symbol | Value | Unit |
|---|--|------------------|-------|
| Peak Repetitive Reverse Voltage | V _{RRM} | 650 | V |
| Single Pulse Avalanche Energy (T _J = 25°C, I _{L(pk)} = 9.9 A, L = 0.5 mH, V = 50 V) | E _{AS} | 24.5 | mJ |
| Continuous Rectified Forward Current | T _C < 154 | I _F | 6.0 A |
| | T _C < 135 | | 9.1 |
| Non-Repetitive Peak Forward Surge Current | T _C = 25°C, t _p = 10 μs | I _{FM} | 493 A |
| | T _C = 150°C, t _p = 10 μs | | 442 |
| Non-Repetitive Forward Surge Current (Half-Sine Pulse) | T _C = 25°C, t _p = 8.3 ms | I _{FSM} | 28 A |
| Power Dissipation | T _C = 25°C | P _{tot} | 75 W |
| | T _C = 150°C | | 12.5 |
| 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.

| | |
|------------------|----------------|
| V _{RRM} | I _F |
| 650 V | 6.0 A |

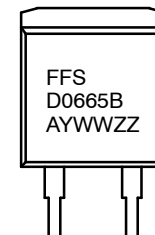


Schottky Diode



DPAK
CASE 369AS

MARKING DIAGRAM



| | |
|-----------|------------------------|
| FFSD0665B | = Specific Device Code |
| A | = Assembly Location |
| Y | = Year |
| WW | = Work Week |
| ZZ | = Assembly Lot Code |

ORDERING INFORMATION

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

FFSD0665B–F085

THERMAL RESISTANCE

| Symbol | Parameter | Value | Unit |
|-----------------|--------------------------------------|-------|------|
| $R_{\theta JC}$ | Thermal Resistance, Junction–to–Case | 2.0 | °C/W |

ELECTRICAL CHARACTERISTICS

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

ON CHARACTERISTICS

| | | | | | | |
|-------|-----------------|--|---|------|-----|---------------|
| V_F | Forward Voltage | $I_F = 6.0 \text{ A}, T_J = 25^\circ\text{C}$ | – | 1.38 | 1.7 | V |
| | | $I_F = 6.0 \text{ A}, T_J = 125^\circ\text{C}$ | – | 1.53 | 2.0 | |
| | | $I_F = 6.0 \text{ A}, T_J = 175^\circ\text{C}$ | – | 1.67 | 2.4 | |
| I_R | Reverse Current | $V_R = 650 \text{ V}, T_J = 25^\circ\text{C}$ | – | 0.5 | 40 | μA |
| | | $V_R = 650 \text{ V}, T_J = 125^\circ\text{C}$ | – | 1.0 | 80 | |
| | | $V_R = 650 \text{ V}, T_J = 175^\circ\text{C}$ | – | 2.0 | 160 | |

CHARGES, CAPACITANCES & GATE RESISTANCE

| | | | | | | |
|-----------|-------------------------|--|---|-----|---|----|
| Q_C | Total Capacitive Charge | $V_C = 400 \text{ V}$ | – | 16 | – | nC |
| C_{tot} | | $V_R = 1 \text{ V}, f = 100 \text{ kHz}$ | – | 259 | – | pF |
| | | $V_R = 200 \text{ V}, f = 100 \text{ kHz}$ | – | 29 | – | |
| | | $V_R = 400 \text{ V}, f = 100 \text{ kHz}$ | – | 22 | – | |

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.

PART MARKING AND ORDERING INFORMATION

| Part Number | Top Mark | Package | Packing Method [†] | Reel Size | Tape Width | Quantity |
|----------------|-----------|---------|-----------------------------|-----------|------------|------------|
| FFSD0665B–F085 | FFSD0665B | DPAK | Tape & Reel | 330 mm | 16 mm | 2500 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

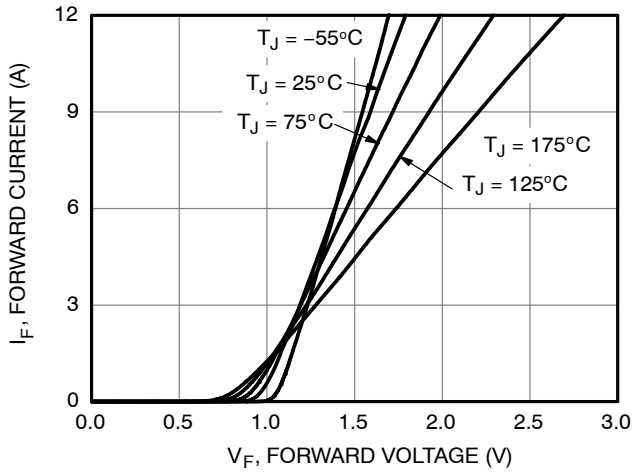


Figure 1. Forward Characteristics

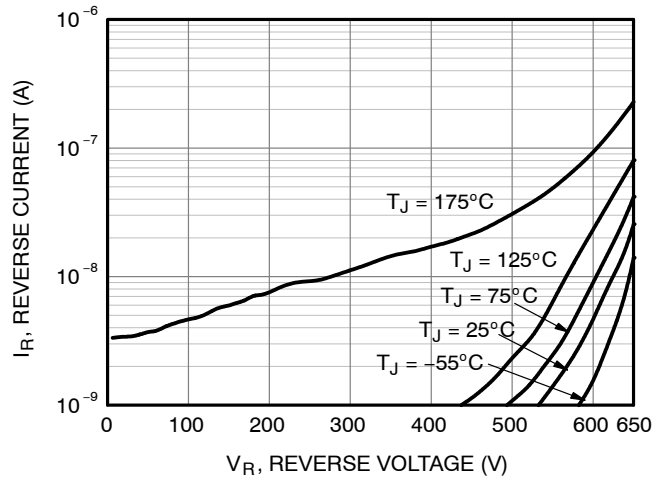


Figure 2. Reverse Characteristics

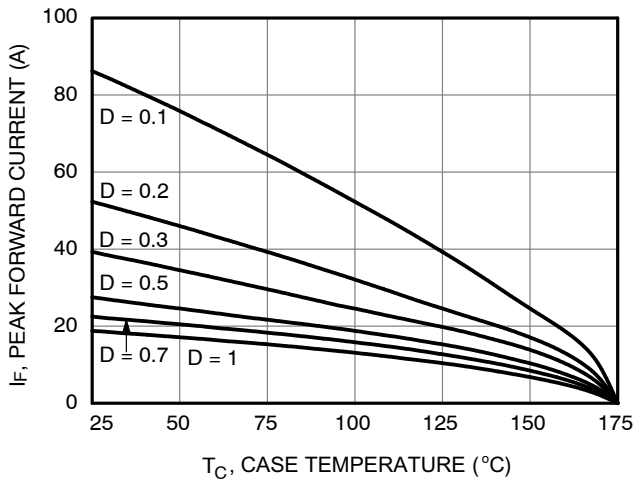


Figure 3. Current Derating

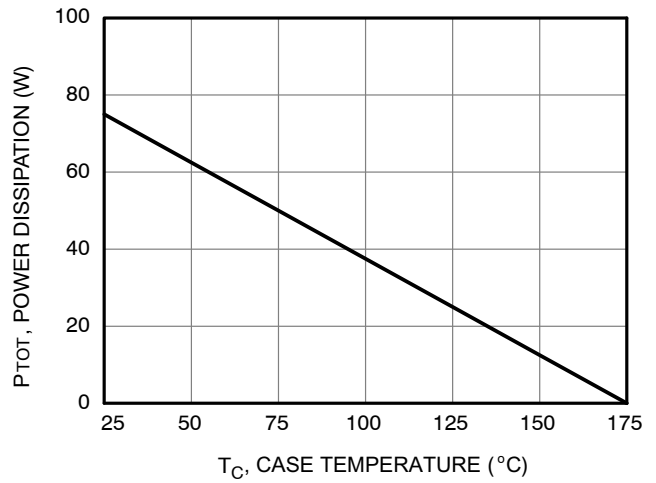


Figure 4. Power Derating

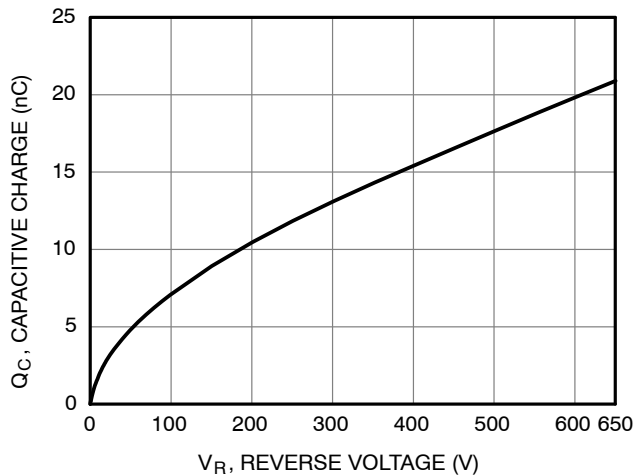


Figure 5. Capacitive Charge vs. Reverse Voltage

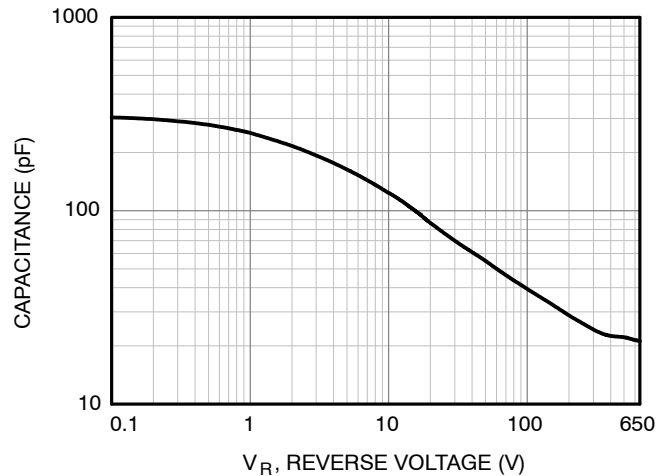


Figure 6. Capacitance vs. Reverse Voltage

TYPICAL CHARACTERISTICS

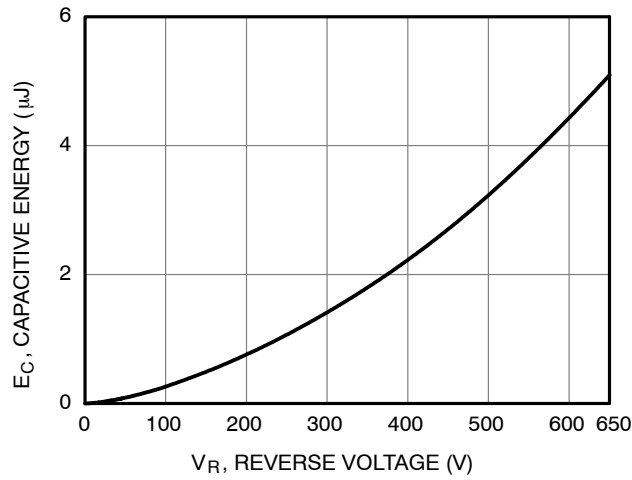


Figure 7. Capacitance Stored Energy

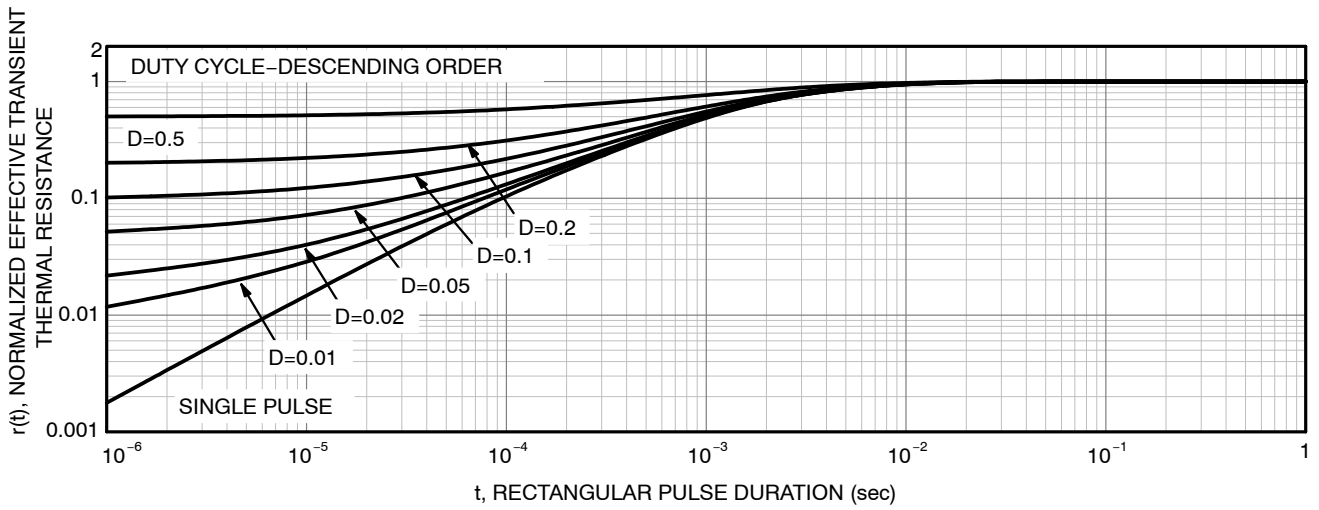
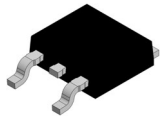


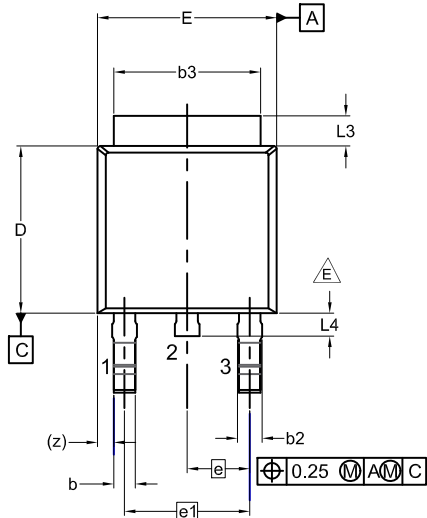
Figure 8. Junction-to-Case Transient Thermal Response

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

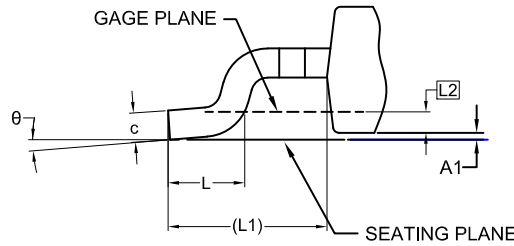


DPAK3 (TO-252 3 LD) CASE 369AS ISSUE A

DATE 28 SEP 2022

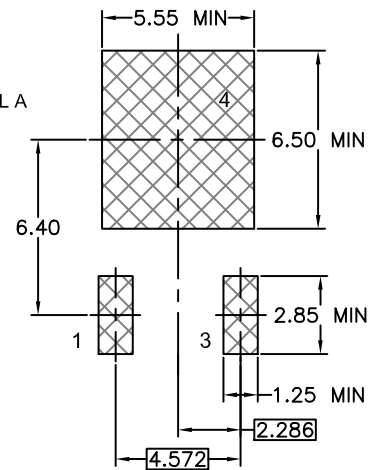
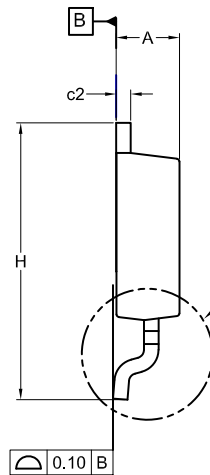
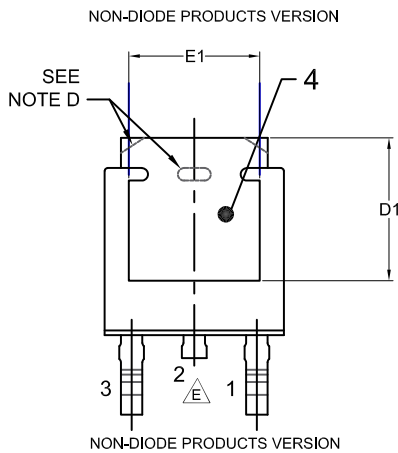


- NOTES: UNLESS OTHERWISE SPECIFIED
 A) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA.
 B) ALL DIMENSIONS ARE IN MILLIMETERS.
 C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
 D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
 E) FOR DIODE PRODUCTS, L4 IS 0.25 MM MAX.
 F) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
 G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.



DETAIL A
(ROTATED -90°)
SCALE: 12X

| DIM | MILLIMETERS | | |
|-----|-------------|------|-------|
| | MIN. | NOM. | MAX. |
| A | 2.18 | 2.29 | 2.39 |
| A1 | 0.00 | - | 0.127 |
| b | 0.64 | 0.77 | 0.89 |
| b2 | 0.76 | 0.95 | 1.14 |
| b3 | 5.21 | 5.34 | 5.46 |
| c | 0.45 | 0.53 | 0.61 |
| c2 | 0.45 | 0.52 | 0.58 |
| D | 5.97 | 6.10 | 6.22 |
| D1 | 5.21 | - | - |
| E | 6.35 | 6.54 | 6.73 |
| E1 | 4.32 | - | - |
| e | 2.286 BSC | | |
| e1 | 4.572 BSC | | |
| H | 9.40 | 9.91 | 10.41 |
| L | 1.40 | 1.59 | 1.78 |
| L1 | 2.90 REF | | |
| L2 | 0.51 BSC | | |
| L3 | 0.89 | 1.08 | 1.27 |
| L4 | - | - | 1.02 |
| θ | 0° | -- | 10° |



GENERIC MARKING DIAGRAM*



- XXXX = Specific Device Code
- A = Assembly Location
- Y = Year
- WW = Work Week
- ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

LAND PATTERN RECOMMENDATION

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

| | | |
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| DESCRIPTION: | DPAK3 (TO-252 3 LD) | PAGE 1 OF 1 |

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