


## Features

- Low forward voltage drop, high efficiency
- Low reverse leakage current
- High peak forward surge current ($I_{FSM}$)
- Reduced EMI
- Maximum operating $T_J$ up to 175 °C
- Epoxy compound is flame retardant to the UL 94V-0 standard
- RoHS compliant*, Pb free and halogen free**

## Applications

- Switched-Mode Power Supplies (SMPS)
- Power Factor Correction (PFC)
- PV inverters
- DC-DC converters
- Telecommunications
- Motor drives

# BSDB10S65E6 Silicon Carbide Schottky Diode

## General Information

Bourns® Model BSDB10S65E6 Silicon Carbide (SiC) Schottky Diode provides excellent current carrying capacity. This advanced, high efficiency power component is suitable for applications such as converters requiring a high peak forward surge capability, a very low forward voltage drop, reduced thermal resistance and low power loss.

Bourns offers Silicon Carbide Schottky Diodes for rectification applications in assorted styles. The Model BSDB10S65E6 is available in a TO263 ($D^2PAK$) package, well-suited for high frequency Switched-Mode Power Supplies.

## Additional Information

Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

## Absolute Maximum Ratings (@ $T_J$ = 25 °C Unless Otherwise Noted)

| Parameter | Symbol | BSDB10S65E6 | Unit |
|---|---|---|---|
| Repetitive Peak Reverse Voltage | $V_{RRM}$ | 650 | V |
| Average Forward Current (Square Wave Pulse, D = 0.5, $T_{mb}$ ≤147 °C, Fig. $Zth_{(J-mb)}$) | $I_{F(AV)}$ | 10 | A |
| Repetitive Peak Forward Current (Square Wave Pulse, D = 0.5, $T_{mb}$ ≤147 °C, $t_p$ = 25 µs, Fig. $Zth_{(J-mb)}$) | $I_{FRM}$ | 20 | A |
| Non-Repetitive Peak Forward Surge Current (10 ms, Single Sine-Wave Pulse) | $I_{FSM}$ | 80 | A |
| Total Power Dissipation | $P_{tot}$ | 125 | W |
| Operating Junction Temperature Range | $T_J$ | -55 to +175 | °C |
| Storage Temperature | $T_{STG}$ | -55 to +175 | °C |

## Thermal Characteristics

| Parameter | | Symbol | Condition or Model | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Thermal Resistance | Junction to Ambient | $R_{θ(J-A)}$ | In ambient air | | 60 | | °C/W |
| | Junction to Mounting Base | $R_{θ(J-mb)}$ | Transient thermal impedance curves | | 1 | 1.2 | |

## Electrical Characteristics (@ $T_J$ = 25 °C Unless Otherwise Noted)

| Parameter | Symbol | Condition or Model | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_F$ | $I_F$ = 10 A, $T_J$ = 25 °C<br>$I_F$ = 10 A, $T_J$ = 175 °C | | 1.29<br>1.5 | 1.45<br>1.7 | V |
| Reverse Leakage Current | $I_R$ | $V_R$ = 650 V, $T_J$ = 25 °C<br>$V_R$ = 650 V, $T_J$ = 175 °C | | 1<br>15 | 50<br>200 | µA |
| Recovered Charge | $Q_r$ | $dI_F/dt$ = 500 A/µs, $V_R$ = 400 V, $I_F$ = 10 A | | 24 | | nC |
| Diode Capacitance | $C_d$ | $V_R$ = 1 V, f = 1 MHz | | 500 | | pF |
| Capacitance Stored Energy | $E_c$ | $V_R$ = 400 V | | 5.1 | | µJ |

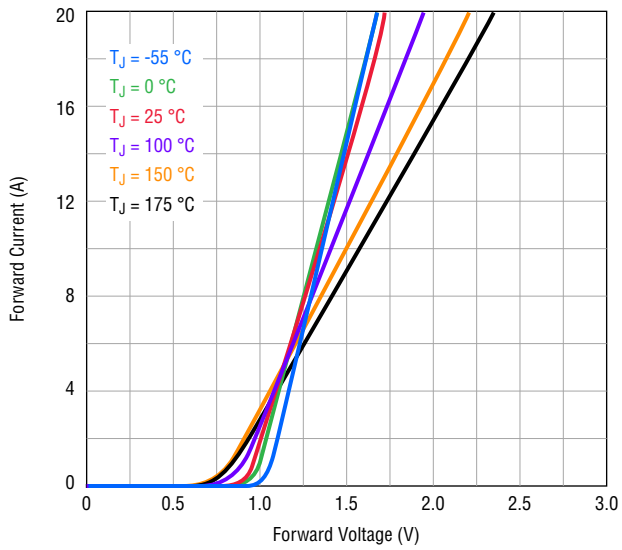
**WARNING Cancer and Reproductive Harm** - www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
**Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.
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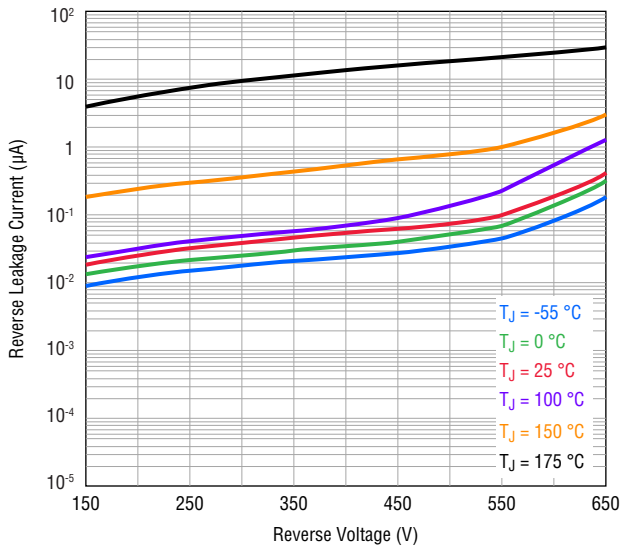
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## Rating and Characteristic Curves ($T_J$ = 25 °C unless otherwise noted)

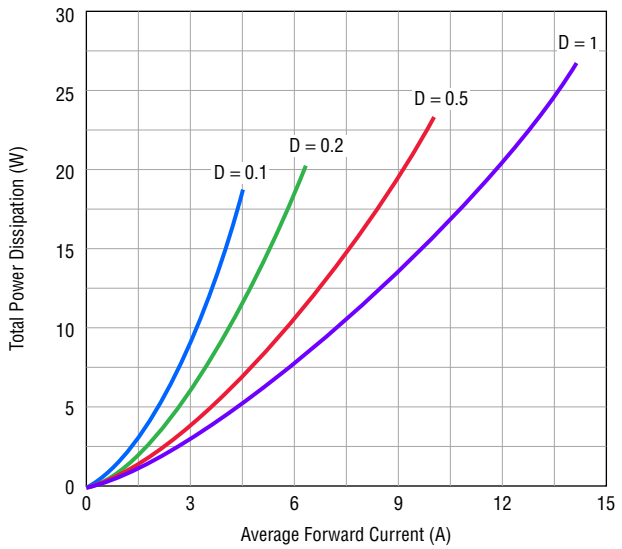
### Typical Forward Characteristics



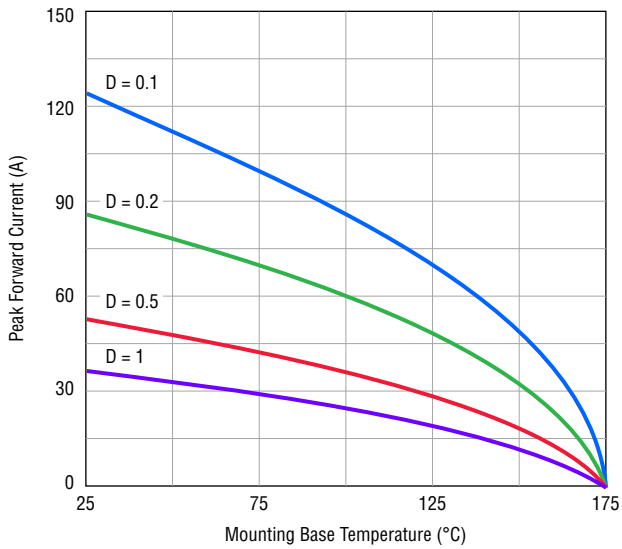

### Typical Reverse Characteristics




### Forward Power Dissipation




### Forward Current Derating

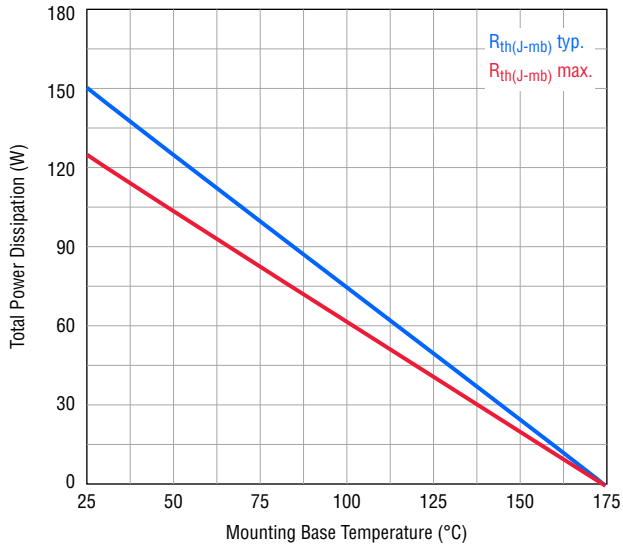



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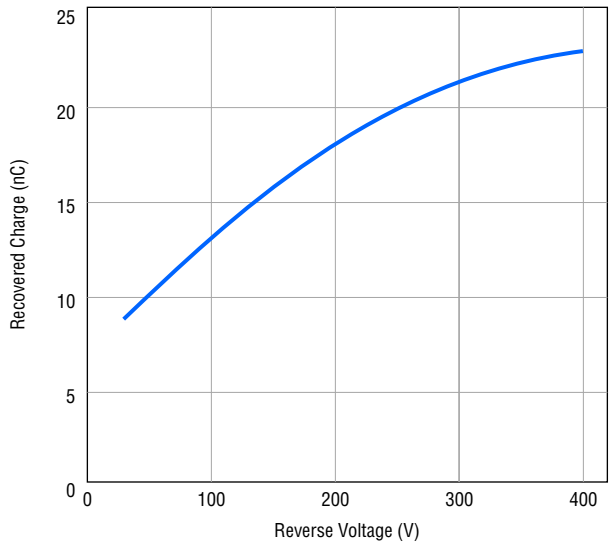
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## Rating and Characteristic Curves (Continued)

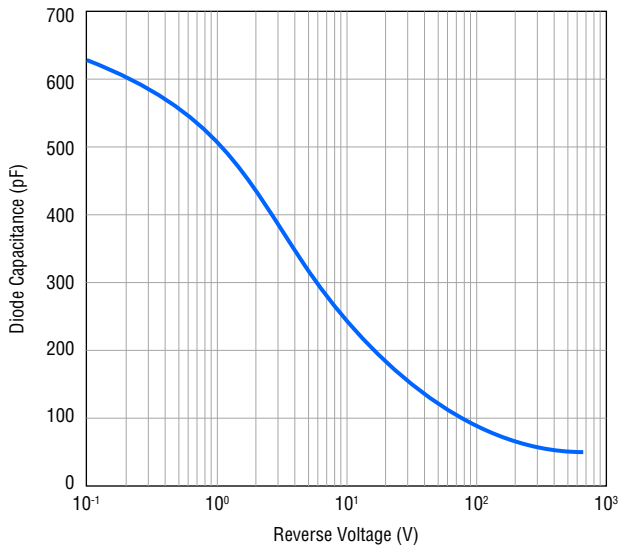
### Power Derating



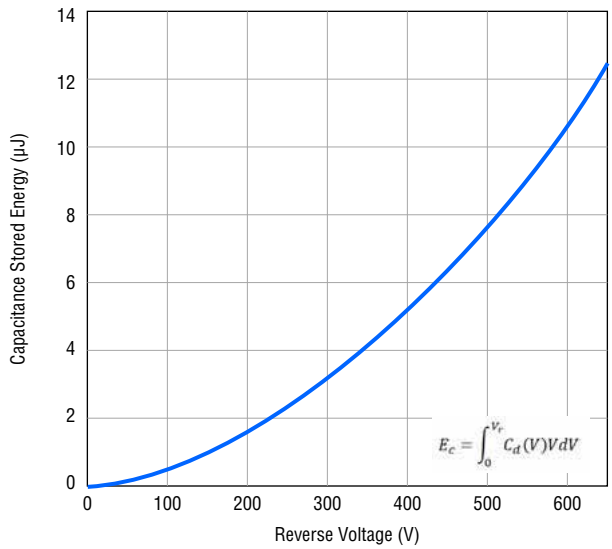

### Typical Recovered Charge vs $V_R$




### Typical Diode Capacitance vs $V_R$



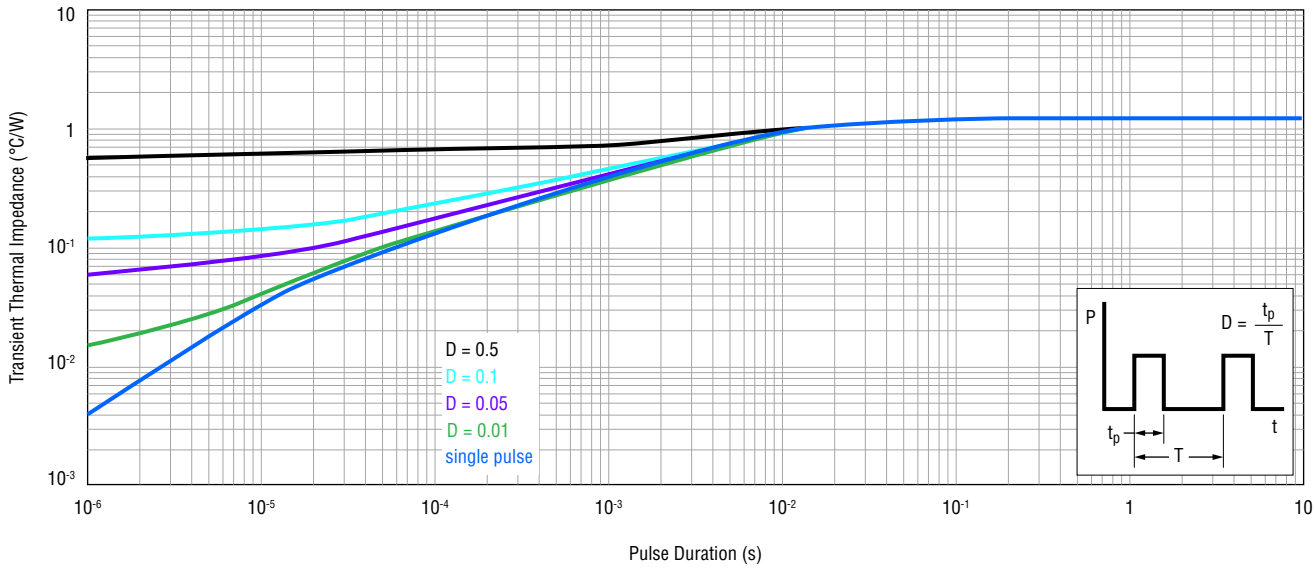

### Typical Capacitance Stored Energy vs $V_R$




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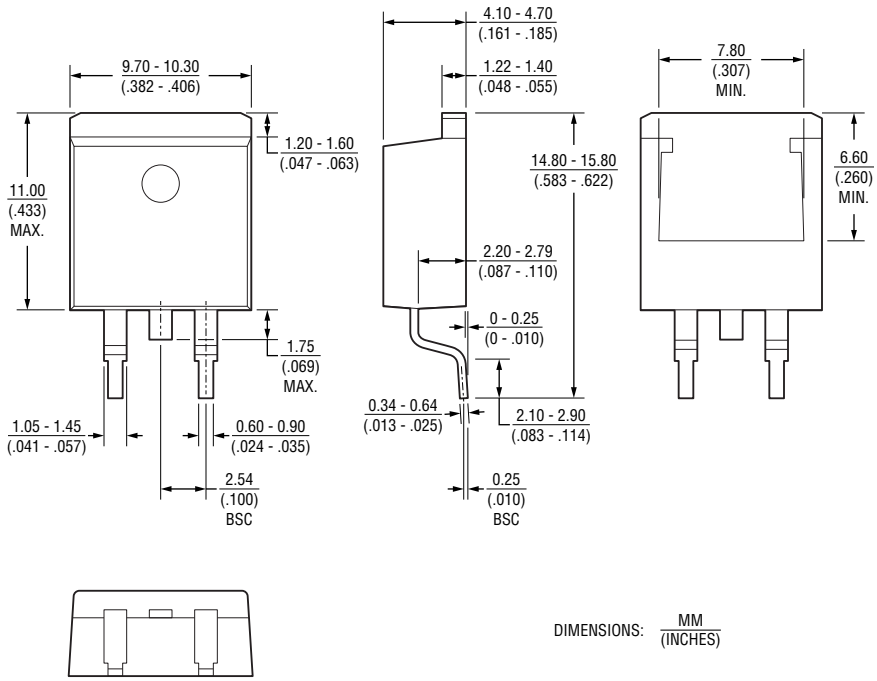
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## Transient Thermal Impedance, $Zth_{(J\text{-}mb)}$



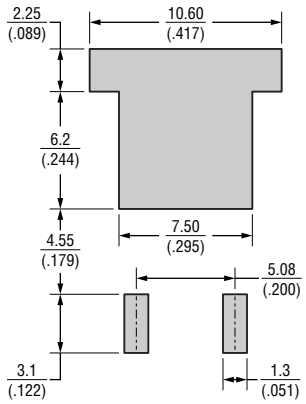

## Product Dimensions

Package: TO263 ($D^2PAK$)




DIMENSIONS: MM / (INCHES)

## Recommended Footprint

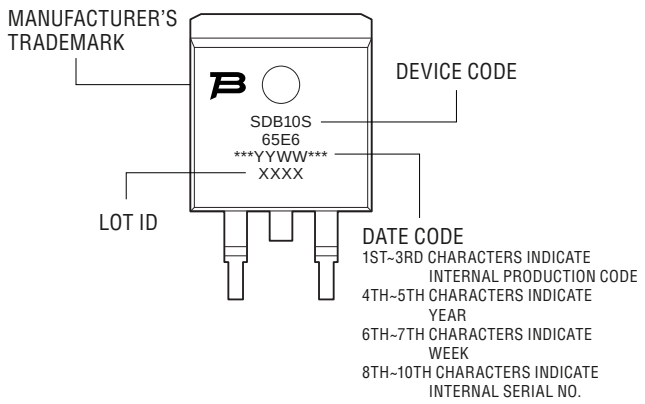



DIMENSIONS: MM / (INCHES)

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## Typical Part Marking




## Environmental Specifications

ESD Classification (HBM).....3B

## How to Order

**B SD B 10 S 65 E 6**

Manufacturer
B = Bourns

Product Type
SD = SiC Diodes

Package Code
H = TO263 ($D^2$ PAK)

Current Rating
10 = 10 A

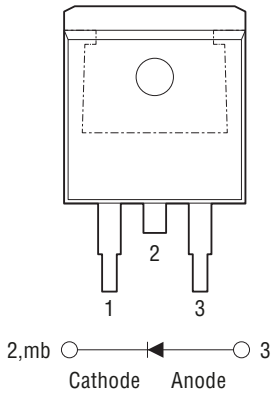
Device Type
S = Low $V_F$

Nominal Voltage
65 = 650 V

Configuration
E = Single Diode

Version Number

## Pin Information

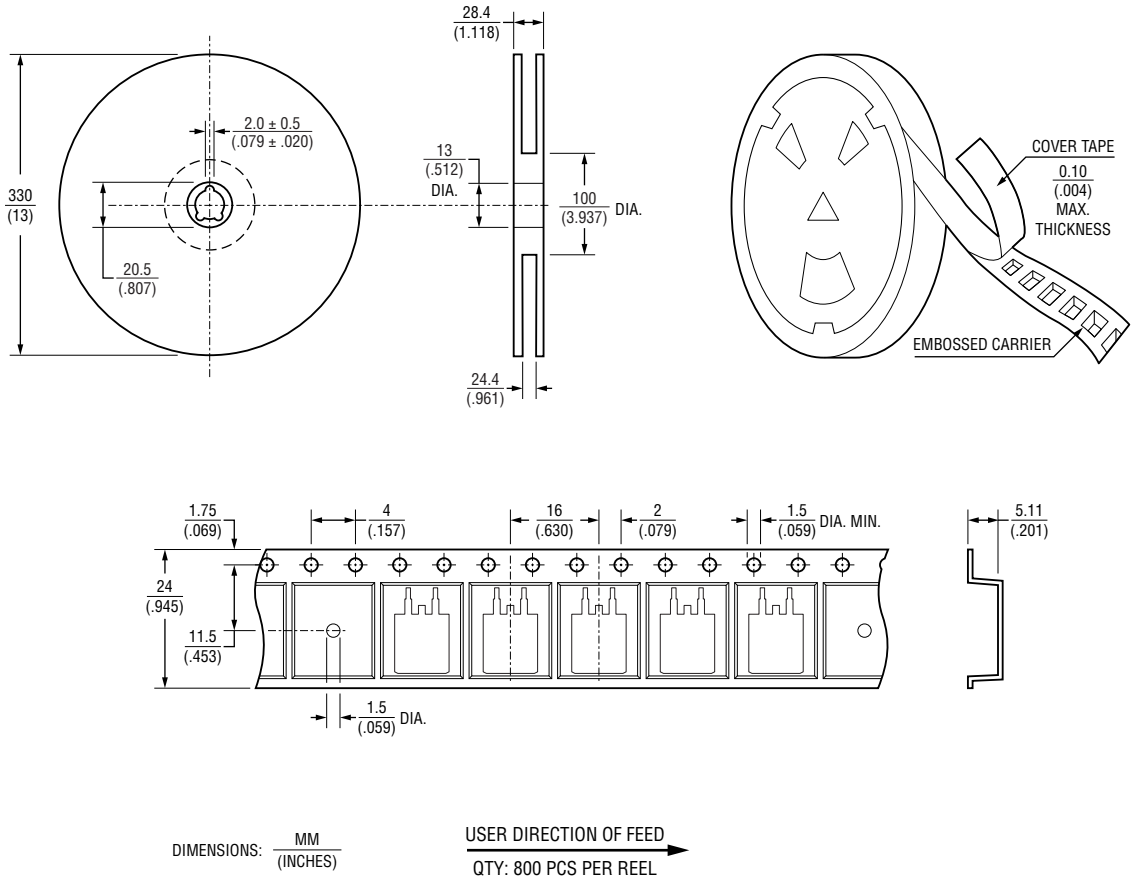



1: N.C. (Not Connected)

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## Packaging Specifications




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