



## 650V/16A Silicon Carbide Power Schottky Barrier Diode

### Features

- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

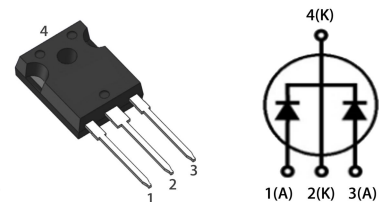
| Key Characteristics               |     |    |
|-----------------------------------|-----|----|
| $V_{RRM}$                         | 650 | V  |
| $I_F, T_c \leq 156^\circ\text{C}$ | 8*  | A  |
| $Q_c$                             | 30* | nC |

### Benefits

- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

### Applications

- SMPS, e.g., CCM PFC;
- Motor drives, Solar application, UPS, Wind turbine, Rail traction, EV/HEV



| Part No.  | Package Type | Marking   |
|-----------|--------------|-----------|
| G3S06516B | TO-247AB     | G3S06516B |

\*Per leg; \*\*Per device

**Maximum Ratings**

| Parameter                                 | Symbol    | Test Condition                                                                     | Value                                          | Unit               |
|-------------------------------------------|-----------|------------------------------------------------------------------------------------|------------------------------------------------|--------------------|
| Repetitive Peak Reverse Voltage           | $V_{RRM}$ |                                                                                    | 650                                            | V                  |
| Surge Peak Reverse Voltage                | $V_{RSM}$ |                                                                                    | 650                                            | V                  |
| DC Blocking Voltage                       | $V_{DC}$  |                                                                                    | 650                                            | V                  |
| Continuous Forward Current                | $I_F$     | $T_C=25^{\circ}\text{C}$<br>$T_C=125^{\circ}\text{C}$<br>$T_C=156^{\circ}\text{C}$ | 29*<br>15.4*<br>8*                             | A                  |
| Repetitive Peak Forward Surge Current     | $I_{FRM}$ | $T_C=25^{\circ}\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave, $D=0.3$             | 40*                                            | A                  |
| Non-repetitive Peak Forward Surge Current | $I_{FSM}$ | $T_C=25^{\circ}\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave                      | 105*                                           | A                  |
| Power Dissipation                         | $P_{TOT}$ | $T_C=25^{\circ}\text{C}$                                                           | 112*                                           | W                  |
|                                           |           | $T_C=110^{\circ}\text{C}$                                                          | 49*                                            | W                  |
| Operating Junction                        | $T_j$     |                                                                                    | $-55^{\circ}\text{C}$ to $175^{\circ}\text{C}$ | $^{\circ}\text{C}$ |
| Storage Temperature                       | $T_{stg}$ |                                                                                    | $-55^{\circ}\text{C}$ to $175^{\circ}\text{C}$ | $^{\circ}\text{C}$ |
| Mounting Torque                           |           | M3 Screw<br>6-32 Screw                                                             | 1<br>8.8                                       | Nm<br>lbf-in       |

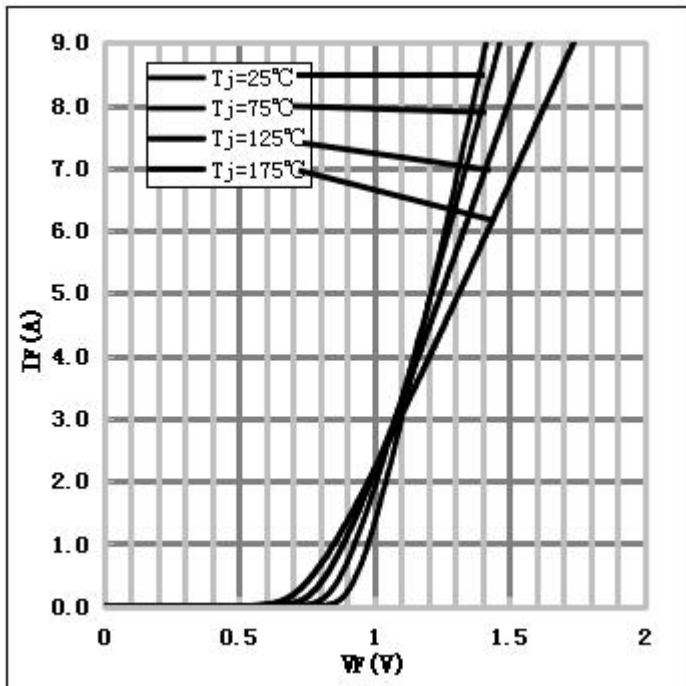
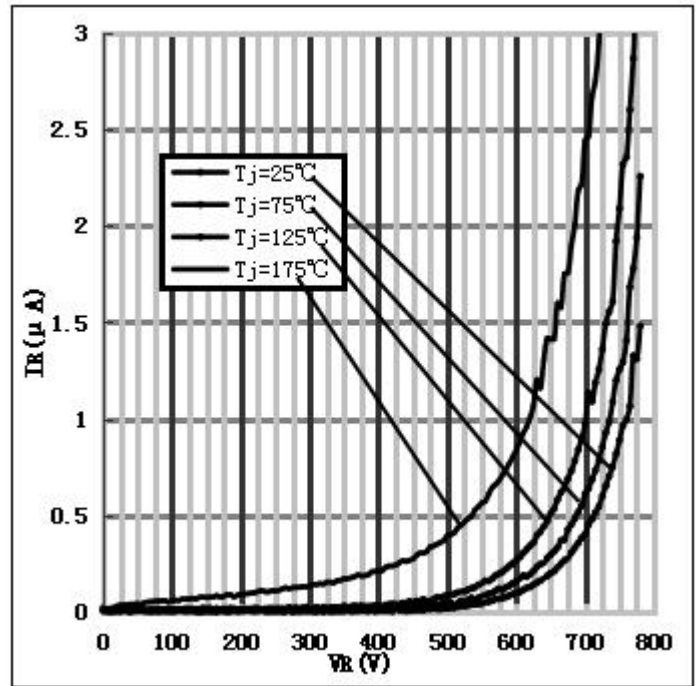
**Thermal Characteristic**

| Parameter                                | Symbol     | Test Condition | Value           | Unit                        |
|------------------------------------------|------------|----------------|-----------------|-----------------------------|
|                                          |            |                | Typ.            |                             |
| Thermal resistance from junction to case | $R_{thJC}$ |                | 1.34*<br>0.67** | $^{\circ}\text{C}/\text{W}$ |

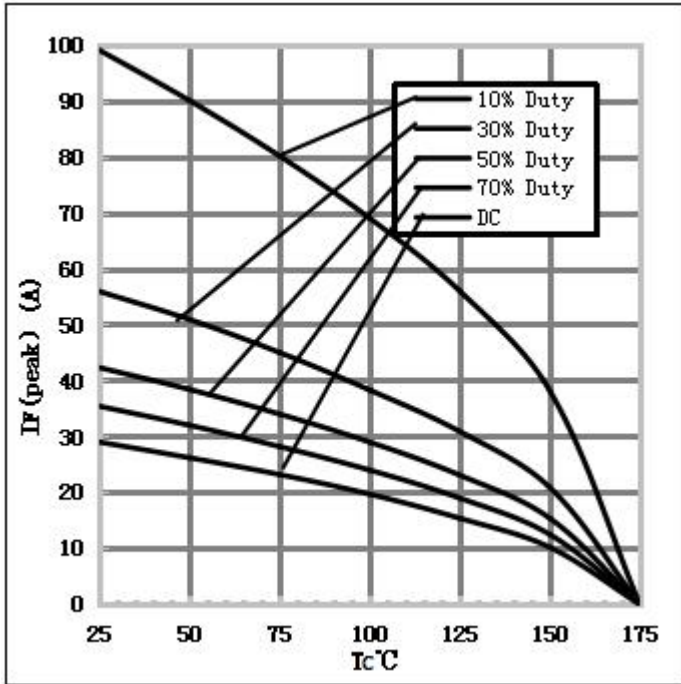
\*Per leg; \*\*Per device

**Electrical Characteristics (Per leg)**

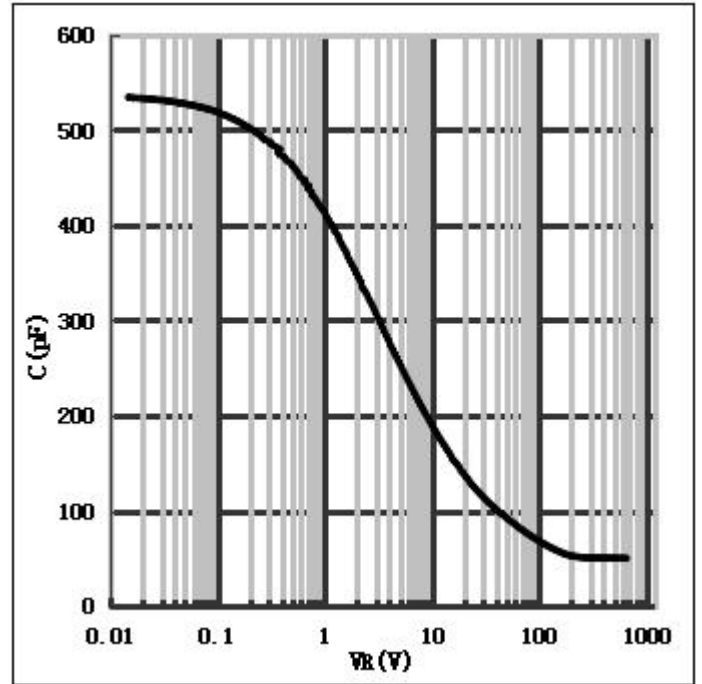
| Parameter               | Symbol | Test Conditions                                             | Numerical |      | Unit    |
|-------------------------|--------|-------------------------------------------------------------|-----------|------|---------|
|                         |        |                                                             | Typ.      | Max. |         |
| Forward Voltage         | $V_F$  | $I_F=8A, T_j=25^{\circ}C$                                   | 1.41      | 1.7  | V       |
|                         |        | $I_F=8A, T_j=175^{\circ}C$                                  | 1.63      | 2    |         |
| Reverse Current         | $I_R$  | $V_R=650V, T_j=25^{\circ}C$                                 | 0.25      | 50   | $\mu A$ |
|                         |        | $V_R=650V, T_j=175^{\circ}C$                                | 1.5       | 100  |         |
| Total Capacitive Charge | $Q_C$  | $V_R=400V, T_j=150^{\circ}C$<br>$Q_C = \int_0^{V_R} C(V)dV$ | 30        | -    | nC      |
| Total Capacitance       | C      | $V_R=0V, T_j=25^{\circ}C, f=1MHz$                           | 550       | 588  | pF      |
|                         |        | $V_R=200V, T_j=25^{\circ}C, f=1MHz$                         | 56.5      | 57   |         |
|                         |        | $V_R=400V, T_j=25^{\circ}C, f=1MHz$                         | 54        | 54.5 |         |

**Performance Graphs (Per leg)**1) Forward IV characteristics as a function of  $T_j$  :2) Reverse IV characteristics as a function of  $T_j$  :

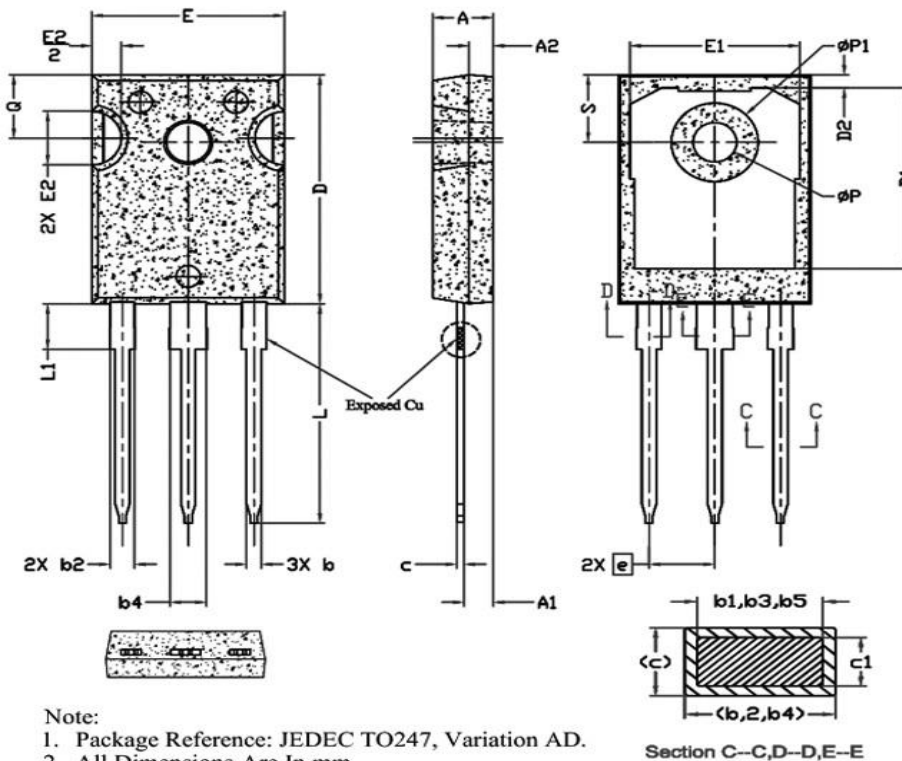
## 3) Current Derating:



## 4) Capacitance vs. reverse voltage:



## Package TO-247AB



単位: mm

## Note:

1. Package Reference: JEDEC TO247, Variation AD.
2. All Dimensions Are In mm.
3. Slot Required, Notch May Be Rounded
4. Dimension D & E Do Not Include Mold Flash. Mold Flash Shall Not Exceed 0.127mm Pre Side. These Dimensions Are Measured At The Outermost Extreme Of The Plastic Body.
5. Thermal Pad Contour Optional Within Dimension D1 & E1.
6. Lead Finish Uncontrolled In L1.
7. ØP To Have A Maximum Draft Angle Of 1.5° To The Top Of The Part With A Maximum Hole Diameter Of 3.91mm.
8. Dimension "b2" And "b4" Does Not Include Dambar Protrusion. Allowable Dambar Protrusion Shall Be 0.10mm Total In Excess Of "b2" And "b4" Dimension At Maximum Material Condition.

| SYMBOL | DIMENSIONS |       |       | NOTES |
|--------|------------|-------|-------|-------|
|        | MIN.       | NOM.  | MAX.  |       |
| A      | 4.83       | 5.02  | 5.21  |       |
| A1     | 2.29       | 2.41  | 2.55  |       |
| A2     | 1.50       | 2.00  | 2.49  |       |
| b      | 1.12       | 1.20  | 1.33  |       |
| b1     | 1.12       | 1.20  | 1.28  |       |
| b2     | 1.91       | 2.00  | 2.39  | 6     |
| b3     | 1.91       | 2.00  | 2.34  |       |
| b4     | 2.87       | 3.00  | 3.22  | 6, 8  |
| b5     | 2.87       | 3.00  | 3.18  |       |
| c      | 0.55       | 0.60  | 0.69  | 6     |
| c1     | 0.55       | 0.60  | 0.65  |       |
| D      | 20.80      | 20.95 | 21.10 | 4     |
| D1     | 16.25      | 16.55 | 17.65 | 5     |
| D2     | 0.51       | 1.19  | 1.35  |       |
| E      | 15.75      | 15.94 | 16.13 | 4     |
| E1     | 13.46      | 14.02 | 14.16 | 5     |
| E2     | 4.32       | 4.91  | 5.49  | 3     |
| e      | 5.44BSC    |       |       |       |
| L      | 19.81      | 20.07 | 20.32 |       |
| L1     | 4.10       | 4.19  | 4.40  | 6     |
| ØP     | 3.56       | 3.61  | 3.65  | 7     |
| ØP1    | 7.19REF.   |       |       |       |
| Q      | 5.39       | 5.79  | 6.20  |       |
| S      | 6.04       | 6.17  | 6.30  |       |

**Note:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC(RoHS2). RoHS Certification and other certifications can be obtained from GPT sales representatives or GPT website: <http://globalpowertech.cn/English/index.asp>

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