

## Features

- Zero Reverse Recovery Current
- Positive Temperature Coefficient
- High-Speed Switching
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant<sup>(Note 2)</sup> ("P" Suffix designates RoHS Compliant. See ordering information)

## Benefits

- Temperature-Independent Performance
- Low Switching Loss
- Low Heat Dissipation Requirements

## Applications

- Switching Power Supply
- Power Factor Correction
- Motor Drive, Traction
- Charging Pile

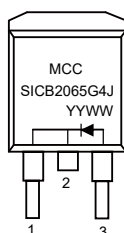
## Maximum Ratings

| Parameter   | Symbol        | Rating | Unit             |
|---|---------------|--------|------------------|
| Peak Repetitive Reverse Voltage@ $T_J=25^{\circ}\text{C}$   | $V_{RRM}$     | 650    | V                |
| Surge Peak Reverse Voltage@ $T_J=25^{\circ}\text{C}$  | $V_{RSM}$     | 650    | V                |
| DC Reverse Voltage@ $T_J=25^{\circ}\text{C}$  | $V_{DC}$      | 650    | V                |
| Continuous forward Current @ $T_C=25^{\circ}\text{C}$   | $I_F$         | 45     | A                |
| Continuous forward Current @ $T_C=135^{\circ}\text{C}$  | $I_F$         | 20     | A                |
| Non-repetitive Peak Forward Surge Current<br>@ $T_C=25^{\circ}\text{C}$ , $t_p=10\text{ms}$ , Half Sine Pulse | $I_{FSM}$     | 135    | A                |
| Power Dissipation @ $T_C=25^{\circ}\text{C}$  | $P_D$         | 130    | W                |
| Power Dissipation @ $T_C=110^{\circ}\text{C}$   | $P_D$         | 56     | W                |
| $i^2t$ Value@ $T_C=25^{\circ}\text{C}$ , $t_p=10\text{ms}$  | $\int i^2 dt$ | 91     | A <sup>2</sup> S |

Note1: Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Note2: High Temperature Solder Exemptions Applied, see EU Directive Annex 7a.

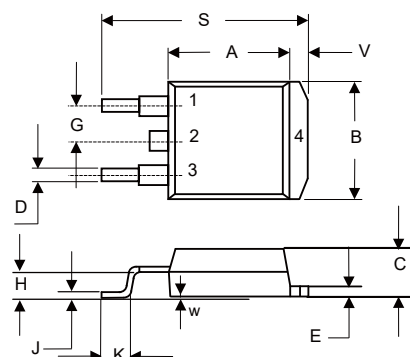
### Internal Structure:



Device Code: SICB2065G4J  
Date Code: YYWW (Year & Week)

# 20Amp Silicon Carbide Schottky Diode 650 Volts

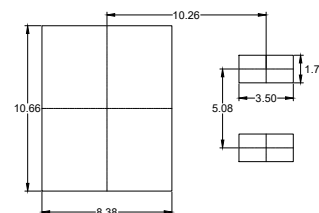
## D<sup>2</sup>-PAK



| DIMENSIONS |        |       |       |       |      |
|------------|--------|-------|-------|-------|------|
| DIM        | INCHES |       | MM    |       | NOTE |
|            | MIN    | MAX   | MIN   | MAX   |      |
| A          | 0.331  | 0.370 | 8.40  | 9.40  |      |
| B          | 0.378  | 0.417 | 9.60  | 10.60 |      |
| C          | 0.165  | 0.189 | 4.20  | 4.80  |      |
| D          | 0.027  | 0.037 | 0.68  | 0.94  |      |
| E          | 0.045  | 0.055 | 1.14  | 1.40  |      |
| G          | 0.10   |       | 2.54  |       | TYP. |
| H          | 0.096  | 0.134 | 2.43  | 3.40  |      |
| J          | 0.011  | 0.025 | 0.28  | 0.64  |      |
| K          | 0.071  | 0.131 | 1.80  | 3.32  |      |
| S          | 0.575  | 0.625 | 14.60 | 15.87 |      |
| V          | 0.042  | 0.058 | 1.07  | 1.47  |      |
| W          | 0.000  | 0.010 | 0.00  | 0.25  |      |

### Suggested Solder Pad Layout

Unit:mm



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

| Parameter                 | Symbol | Conditions                   | Typ. | Max. | Units   |
|---------------------------|--------|------------------------------|------|------|---------|
| Forward Voltage           | $V_F$  | $I_F=20A, T_J=25^{\circ}C$   | 1.38 | 1.6  | V       |
|                           |        | $I_F=20A, T_J=175^{\circ}C$  | 1.75 |      | V       |
| Reverse Leakage Current   | $I_R$  | $V_R=650V, T_J=25^{\circ}C$  | 0.5  | 25   | $\mu A$ |
|                           |        | $V_R=650V, T_J=175^{\circ}C$ | 5.0  |      | $\mu A$ |
| Total Capacitive Charge   | $Q_C$  | $V_R=400V$                   | 61   |      | nC      |
| Total capacitance         | C      | $V_R=0V, f=1MHz$             | 1150 |      | pF      |
|                           |        | $V_R=200V, f=1MHz$           | 113  |      | pF      |
|                           |        | $V_R=400V, f=1MHz$           | 107  |      | pF      |
| Capacitance Stored Energy | $E_C$  | $V_R=400V$                   | 9.4  |      | $\mu J$ |

**Thermal characteristics**

| Parameter                                | Symbol         | Min | Typ  | Max | Unit          |
|--|----------------|-----|------|-----|---------------|
| Operating Junction Temperature Range     | $T_J$          | -55 |      | 175 | $^{\circ}C$   |
| Storage Temperature Range                | $T_{stg}$      | -55 |      | 175 | $^{\circ}C$   |
| Thermal Resistance from Junction to Case | $R_{th_{J-C}}$ |     | 1.15 |     | $^{\circ}C/W$ |

## Curve Characteristics

Figure 1. Forward Characteristics

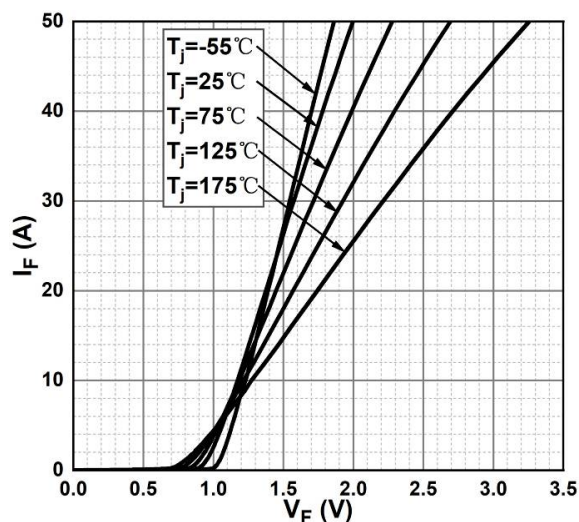


Figure 2. Reverse Characteristics

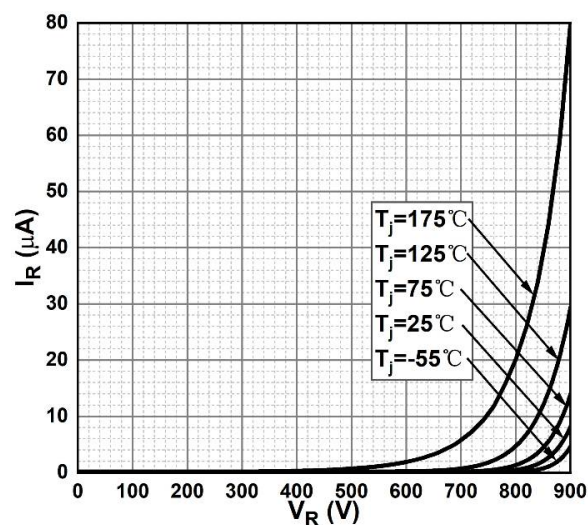


Figure 3. Capacitance vs. Reverse Voltage

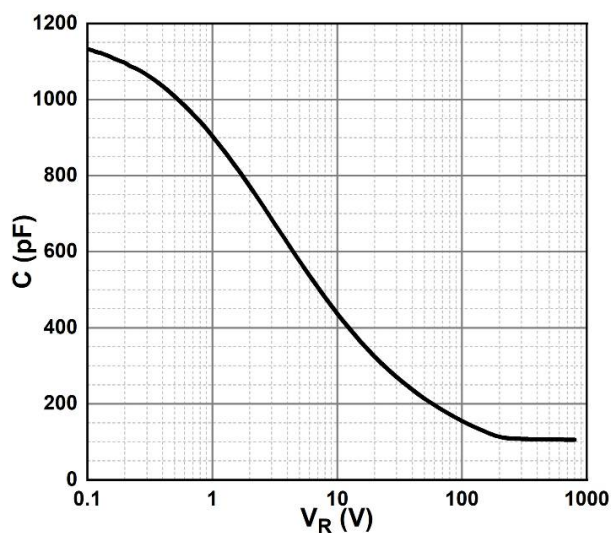


Figure 4. Total Capacitance Charge vs. Reverse Voltage

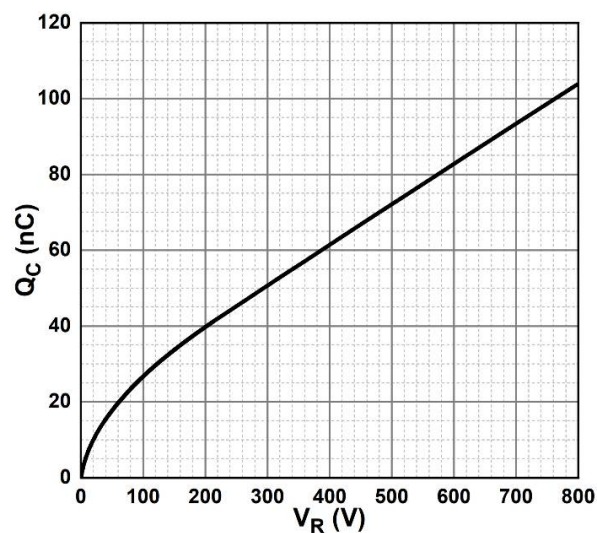


Figure 5. Capacitance Stored Energy

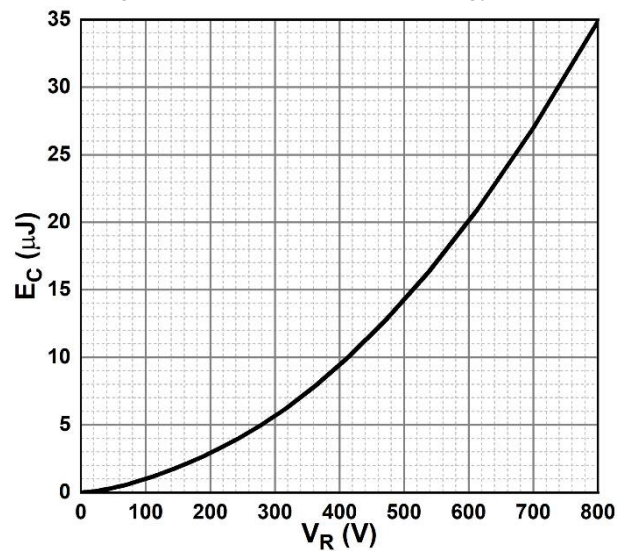
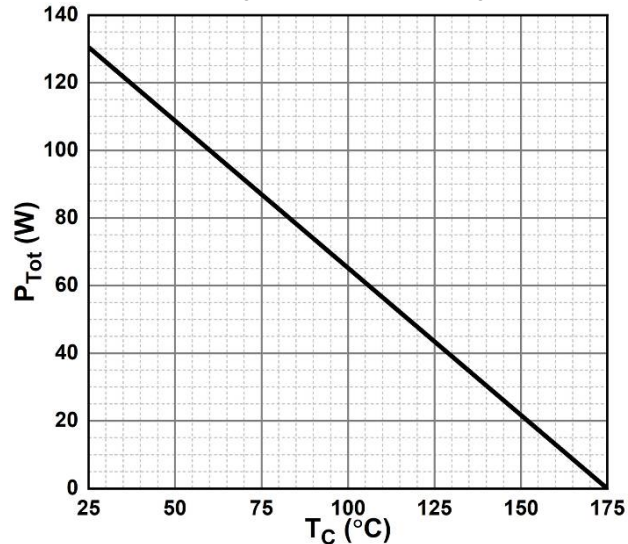


Figure 6. Power Derating



## Curve Characteristics

Figure 7. Current Derating

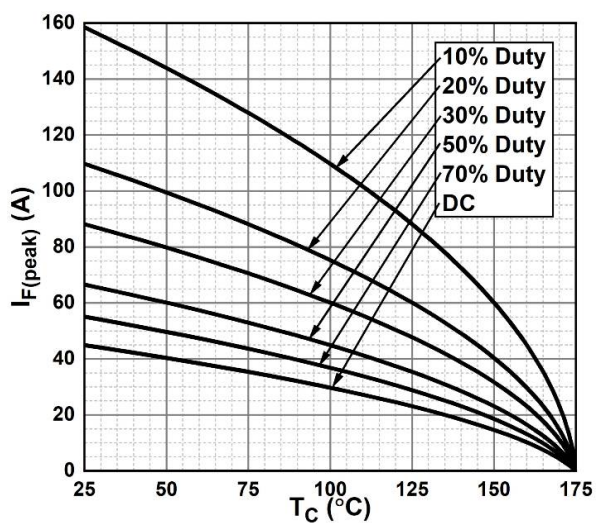
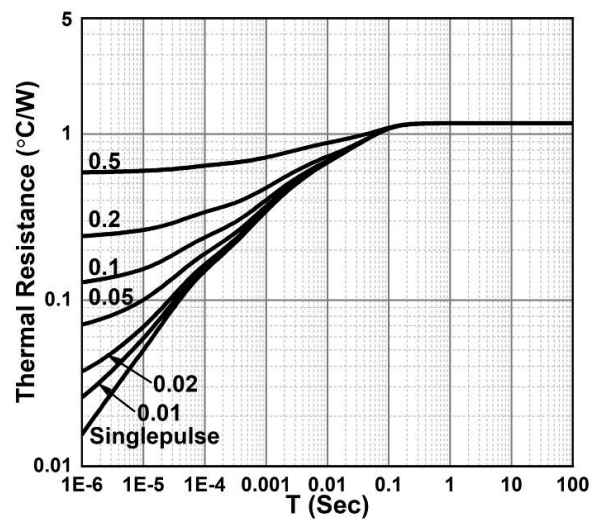


Figure 8. Transient Thermal Impedance



## Ordering Information

| Device         | Packing                |
|----------------|------------------------|
| Part Number-TP | Tape&Reel: 800pcs/Reel |

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