

## Silicon Carbide Schottky Diode

Reverse Voltage - 650 Volts  
 Forward Current - 20.0Amperes

### Description:

SiC Schottky Diode has no switching loss, provides improved system efficiency against Si diodes by utilizing new semiconductor material-Silicon Carbide, enables higher operating frequency, and helps increasing power density and reduction of system size /cost. Its high reliability ensures robust operation during surge or over\_voltage conditions.

### Features:

- Max Junction Temperature 175°C
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery/No Forward Recovery

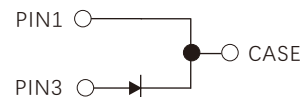
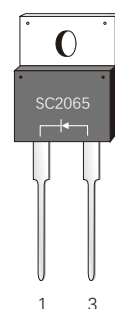
### Mechanical Data:

- Case: JEDEC TO-220AC
- Molding compound meets UL94V-0 flammability rating
- Terminals: Lead solderable per J-STD-002 and JESD22-B102
- Polarity: As marked
- Mounting Torque: 10 in-lbs maximum

### Applications:

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

TO-220AC  
**KWSC2065**



### KEY PERFORMANCE AND PACKAGE PARAMETERS

| Type     | V <sub>DC</sub> | I <sub>F</sub> | Q <sub>c</sub> | T <sub>J,max</sub> | Package  |
|----------|-----------------|----------------|----------------|--------------------|----------|
| KWSC2065 | 650V            | 20A            | 40nC           | 175°C              | TO-220AC |

## RATINGS AND CHARACTERISTIC OF KWSC2065

### MAXIMUM RATINGS

(Ratings at 25°C ambient temperature unless otherwise specified )

| Parameter                                                                      | Symbol      | Value                                                                                                         | Unit                 |
|--------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------|----------------------|
| Maximum Repetitive Peak Reverse Voltage                                        | $V_{RRM}$   | 650                                                                                                           | V                    |
| Continuous Forward Current for $R_{th(j-c)}$                                   | $I_F$       | 20( $T_c \leq 150^\circ\text{C}$ )<br>33( $T_c \leq 125^\circ\text{C}$ )<br>66( $T_c \leq 25^\circ\text{C}$ ) | A                    |
| Non-Repetitive Forward Surge Current<br>(Half-Sine Pulse, $t_p=8.3\text{ms}$ ) | $I_{FSM}$   | 130                                                                                                           | A                    |
| $I^2t$ value                                                                   | $\int I^2T$ | 70                                                                                                            | $\text{A}^2\text{S}$ |
| Power dissipation for $R_{th(j-c, max)}$ ( $T_c=25^\circ\text{C}$ )            | $P_{tot}$   | 176                                                                                                           | W                    |
| Operating junction temperature range                                           | $T_j$       | -55...175                                                                                                     | $^\circ\text{C}$     |
| Storage temperature range                                                      | $T_{stg}$   | -55...175                                                                                                     | $^\circ\text{C}$     |

### THERMAL CHARACTERISTICS

| Parameter                                 | Symbol        | Typ | Max  | Unit               |
|-------------------------------------------|---------------|-----|------|--------------------|
| Diode thermal resistance<br>junction-case | $R_{th(j-c)}$ | -   | 0.85 | $^\circ\text{C/W}$ |

## RATINGS AND CHARACTERISTIC OF KWSC2065

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C Unless otherwise noted)

| Parameter             | Symbol                       | Conditions                                 | Value |      |      | Unit |
|-----------------------|------------------------------|--------------------------------------------|-------|------|------|------|
|                       |                              |                                            | min   | typ  | max  |      |
| DC blocking voltage   | V <sub>DC</sub>              | T <sub>j</sub> =25...175 °C                | 650   | -    | -    | V    |
| Diode forward voltage | V <sub>F</sub> <sup>1)</sup> | I <sub>F</sub> =20A T <sub>j</sub> =25°C   | -     | 1.35 | 1.60 | V    |
|                       |                              | I <sub>F</sub> =20A T <sub>j</sub> =175 °C | -     | 1.60 | 2.15 |      |
| Reverse current       | I <sub>R</sub> <sup>2)</sup> | V <sub>R</sub> =650V T <sub>j</sub> =25°C  | -     | -    | 20   | uA   |
|                       |                              | V <sub>R</sub> =650V T <sub>j</sub> =175°C | -     | -    | 200  |      |

Notes: 1.Pulse test: 300 μs pulse width,1% duty cycle  
 2.Pulse test: pulse width ≤40ms

### DYNAMIC CHARACTERISTICS(at T<sub>j</sub>=25°C,unless otherwise specified)

| Parameter              | Symbol         | conditions                                                                              | Value |                   |     | Unit |
|------------------------|----------------|-----------------------------------------------------------------------------------------|-------|-------------------|-----|------|
|                        |                |                                                                                         | min   | typ               | max |      |
| Total capacitivecharge | Q <sub>c</sub> | V <sub>R</sub> =650V,I <sub>F</sub> =20A<br>di/dt=200A/uS                               | -     | 40                | -   | nC   |
| Total capacitance      | C <sub>j</sub> | V <sub>R</sub> =0V,f=1MHz<br>V <sub>R</sub> =200V,f=1MHz<br>V <sub>R</sub> =400V,f=1MHz |       | 1153<br>115<br>96 |     | pF   |

## RATINGS AND CHARACTERISTIC OF KWSC2065

FIG.1-FORWARD CURRENT DERATING CURVE

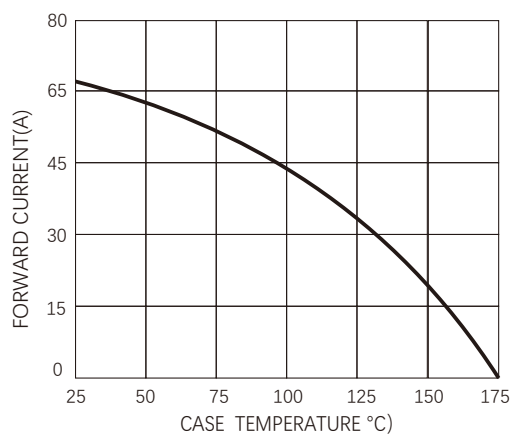


FIG.2-POWER DERATING CURVE

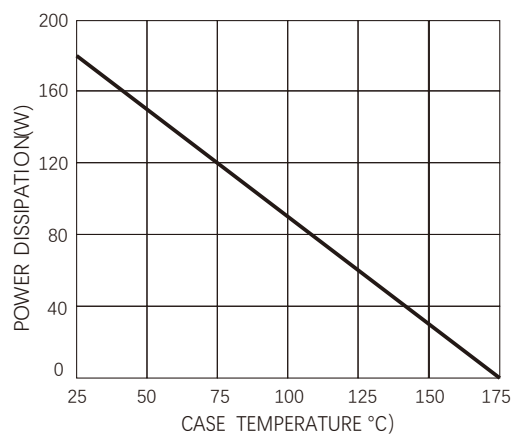


FIG.3-FORWARD CURRENT DERATING CURVE

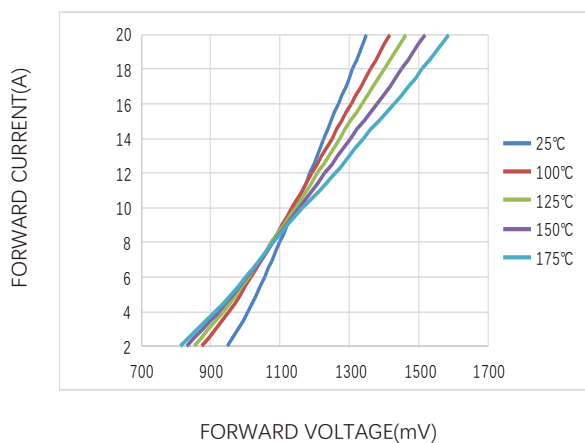
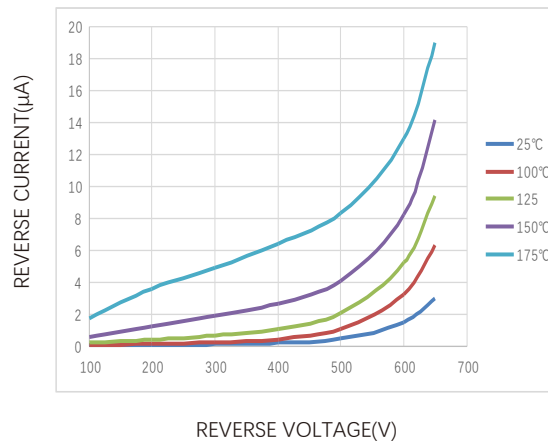


FIG.4-REVERSE CHARACTERISTICS



## PACKAGE OUTLINE DIMENSIONS

Dimensions in inches and (millimeters)

### TO-220AC

