

|       |       |
|-------|-------|
| $V_R$ | 1200V |
| $I_F$ | 20A   |
| $Q_C$ | 65nC  |

### ●Features

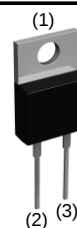
- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible

### ●Construction

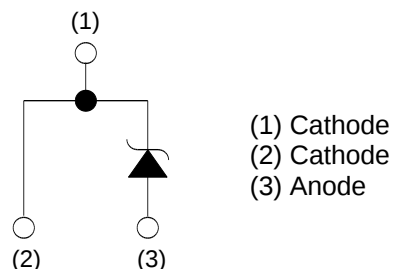
Silicon carbide epitaxial planer type

### ●Outline

TO-220AC



### ●Inner circuit



### ●Packaging specifications

|      |                           |          |
|------|---------------------------|----------|
| Type | Packaging                 | Tube     |
|      | Reel size (mm)            | -        |
|      | Tape width (mm)           | -        |
|      | Basic ordering unit (pcs) | 50       |
|      | Taping code               | C        |
|      | Marking                   | SCS220KG |

### ●Absolute maximum ratings ( $T_j = 25^\circ\text{C}$ )

| Parameter                           | Symbol    | Value             | Unit             |
|-------------------------------------|-----------|-------------------|------------------|
| Reverse voltage (repetitive peak)   | $V_{RM}$  | 1200              | V                |
| Reverse voltage (DC)                | $V_R$     | 1200              | V                |
| Continuous forward current          | $I_F$     | 20 <sup>*1</sup>  | A                |
| Surge no repetitive forward current | $I_{FSM}$ | 82 <sup>*2</sup>  | A                |
|                                     |           | 310 <sup>*3</sup> | A                |
|                                     |           | 62 <sup>*4</sup>  | A                |
| Repetitive peak forward current     | $I_{FRM}$ | 77 <sup>*5</sup>  | A                |
| Total power dissipation             | $P_D$     | 210 <sup>*6</sup> | W                |
| Junction temperature                | $T_j$     | 175               | $^\circ\text{C}$ |
| Range of storage temperature        | $T_{stg}$ | -55 to +175       | $^\circ\text{C}$ |

\*1  $T_c=133^\circ\text{C}$  \*2  $PW=8.3\text{ms}$  sinusoidal,  $T_j=25^\circ\text{C}$  \*3  $PW=10\mu\text{s}$  square,  $T_j=25^\circ\text{C}$

\*4  $PW=8.3\text{ms}$  sinusoidal,  $T_j=150^\circ\text{C}$  \*5  $T_c=100^\circ\text{C}$ ,  $T_j=150^\circ\text{C}$ , Duty cycle=10% \*6  $T_c=25^\circ\text{C}$

## ●Electrical characteristics (Tj = 25°C)

| Parameter               | Symbol          | Conditions                          | Values |      |      | Unit |
|-------------------------|-----------------|-------------------------------------|--------|------|------|------|
|                         |                 |                                     | Min.   | Typ. | Max. |      |
| DC blocking voltage     | V <sub>DC</sub> | I <sub>R</sub> =0.4mA               | 1200   | -    | -    | V    |
| Forward voltage         | V <sub>F</sub>  | I <sub>F</sub> =20A, Tj=25°C        | -      | 1.4  | 1.6  | V    |
|                         |                 | I <sub>F</sub> =20A, Tj=150°C       | -      | 1.8  | -    | V    |
|                         |                 | I <sub>F</sub> =20A, Tj=175°C       | -      | 1.9  | -    | V    |
| Reverse current         | I <sub>R</sub>  | V <sub>R</sub> =1200V, Tj=25°C      | -      | 20   | 400  | μA   |
|                         |                 | V <sub>R</sub> =1200V, Tj=150°C     | -      | 160  | -    | μA   |
|                         |                 | V <sub>R</sub> =1200V, Tj=175°C     | -      | 260  | -    | μA   |
| Total capacitance       | C               | V <sub>R</sub> =1V, f=1MHz          | -      | 1060 | -    | pF   |
|                         |                 | V <sub>R</sub> =800V, f=1MHz        | -      | 85   | -    | pF   |
| Total capacitive charge | Qc              | V <sub>R</sub> =800V, di/dt=500A/μs | -      | 65   | -    | nC   |
| Switching time          | t <sub>c</sub>  | V <sub>R</sub> =800V, di/dt=500A/μs | -      | 18   | -    | ns   |

## ●Thermal characteristics

| Parameter          | Symbol               | Conditions | Values |      |      | Unit |
|--------------------|----------------------|------------|--------|------|------|------|
|                    |                      |            | Min.   | Typ. | Max. |      |
| Thermal resistance | R <sub>th(j-c)</sub> | -          | -      | 0.62 | 0.71 | °C/W |

●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

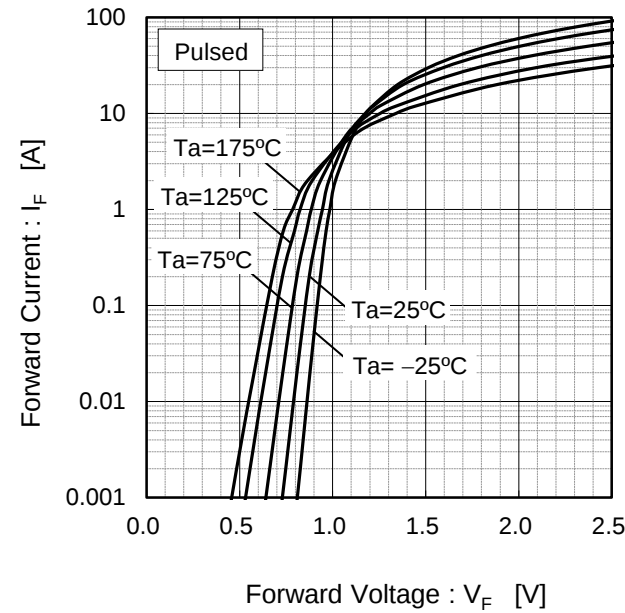


Fig.2  $V_F - I_F$  Characteristics

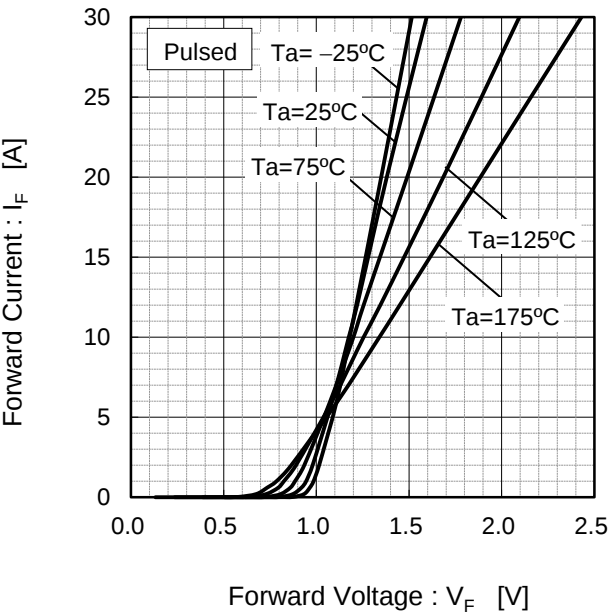


Fig.3  $V_R - I_R$  Characteristics

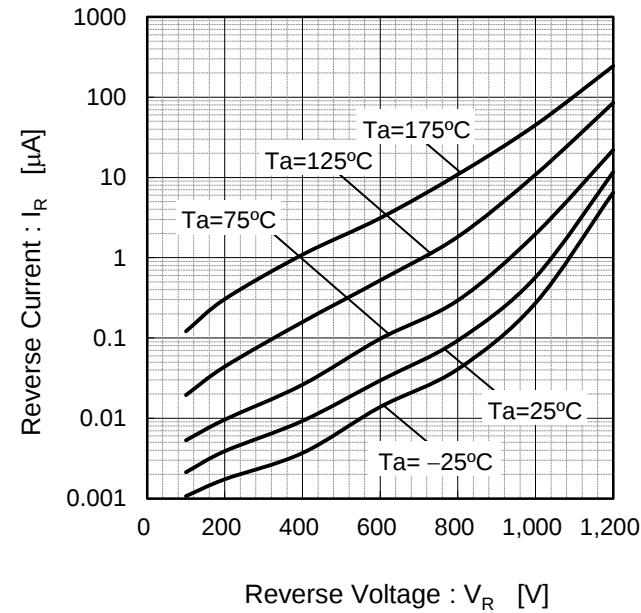
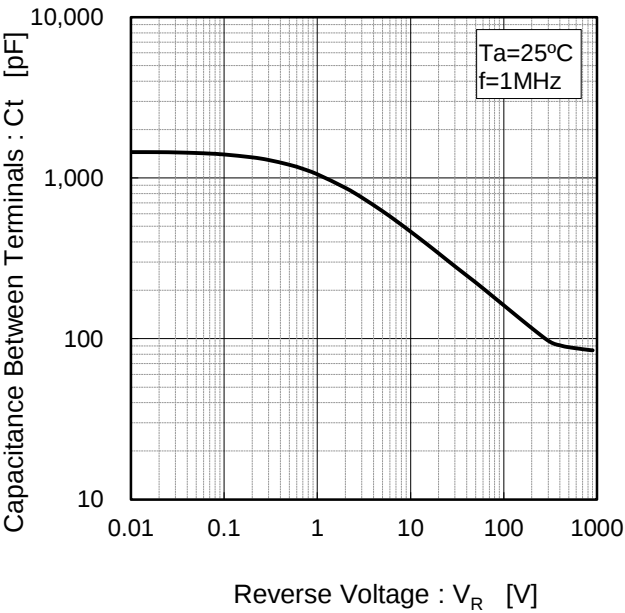


Fig.4  $V_R - C_t$  Characteristics



●Electrical characteristic curves

Fig.5 Thermal Resistance vs. Pulse Width

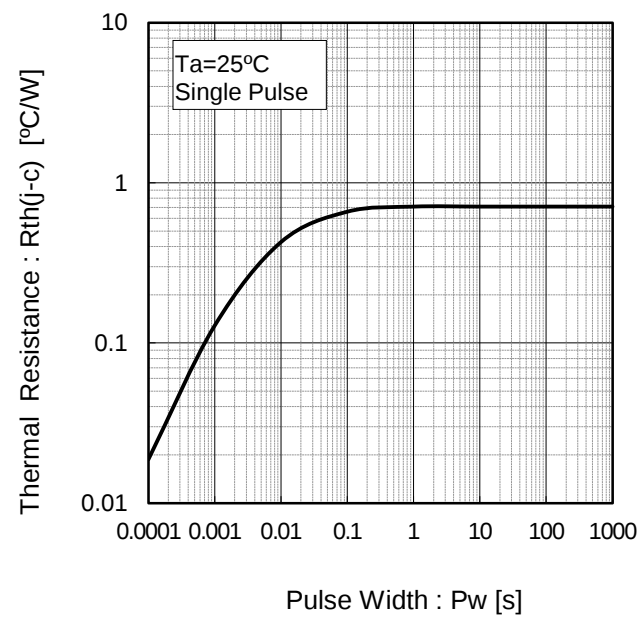


Fig.6 Power Dissipation

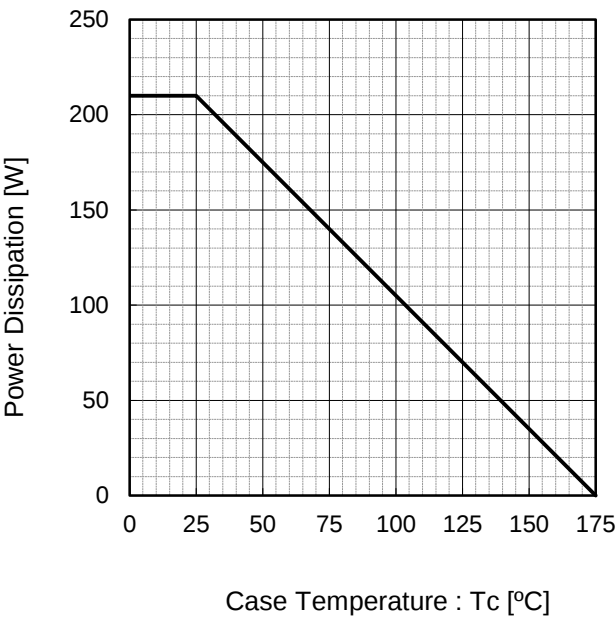


Fig.7  $I_p$ - $T_c$  Derating Curve

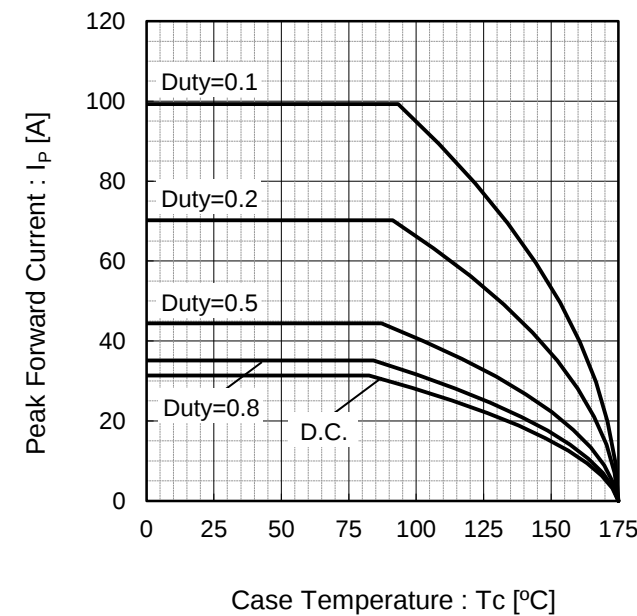
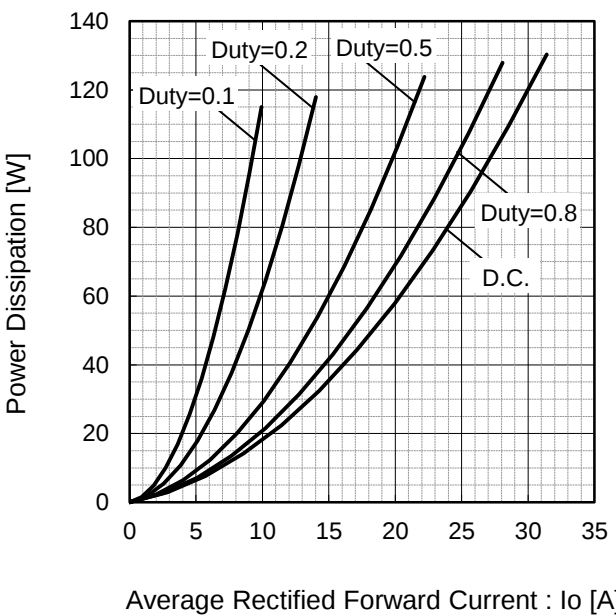
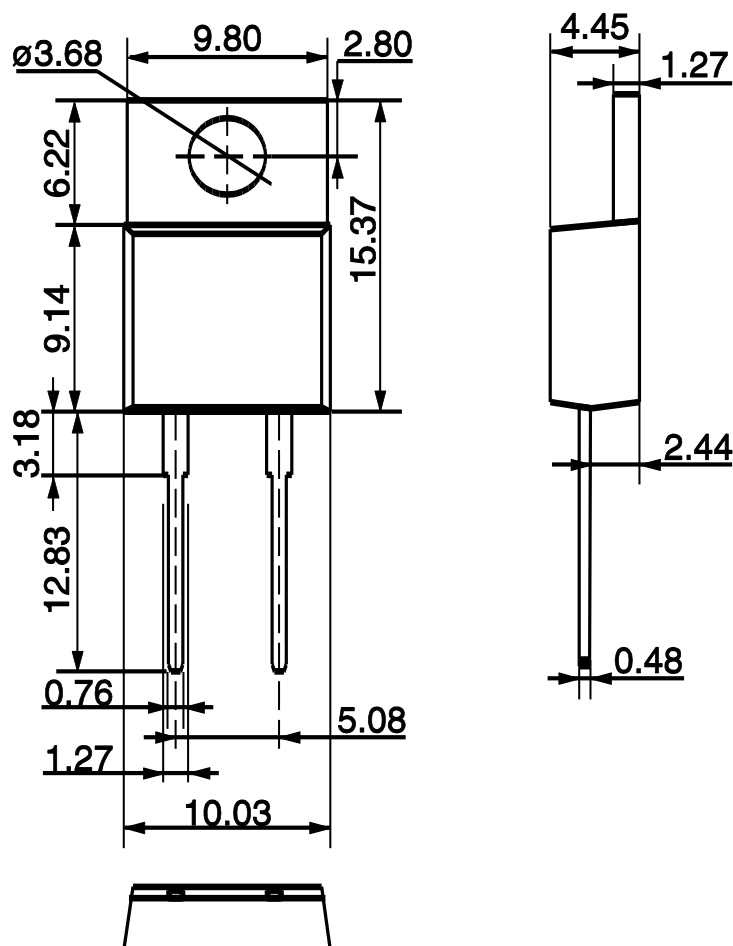


Fig.8  $I_o$ - $P_f$  Characteristics



## ●Dimensions (Unit : mm)

## TO-220AC



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