

|       |               |
|-------|---------------|
| $V_R$ | 1200V         |
| $I_F$ | 10A/20A*      |
| $Q_C$ | 34nC(Per leg) |

\*(Per leg / Both legs)

### ●Features

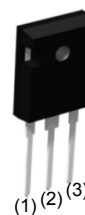
- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible

### ●Construction

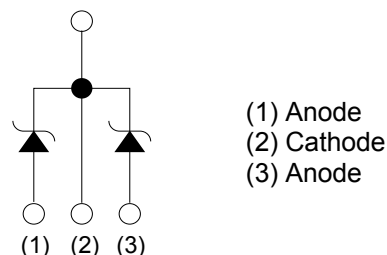
Silicon carbide epitaxial planer type

### ●Outline

TO-247



### ●Inner circuit



### ●Packaging specifications

|      |                           |           |
|------|---------------------------|-----------|
| Type | Packaging                 | Tube      |
|      | Reel size (mm)            | -         |
|      | Tape width (mm)           | -         |
|      | Basic ordering unit (pcs) | 30        |
|      | Taping code               | C         |
|      | Marking                   | SCS220KE2 |

### ●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 <sup>*7</sup>          | $I_F$     | 10/20 <sup>*1</sup>   | A                |
| Surge no repetitive forward current <sup>*7</sup> | $I_{FSM}$ | 44/88 <sup>*2</sup>   | A                |
|                                                   |           | 170/340 <sup>*3</sup> | A                |
|                                                   |           | 33/66 <sup>*4</sup>   | A                |
| Repetitive peak forward current <sup>*7</sup>     | $I_{FRM}$ | 43/89 <sup>*5</sup>   | A                |
| Total power dissipation <sup>*7</sup>             | $P_D$     | 130/280 <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  $T_c=143^\circ\text{C}/T_c=144^\circ\text{C}$  \*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  $T_c=25^\circ\text{C}$  \*7 Per leg / Both legs

**●Electrical characteristics** (T<sub>j</sub> = 25°C) (Per leg)

| Parameter               | Symbol          | Conditions                                   | Values |      |      | Unit |
|-------------------------|-----------------|----------------------------------------------|--------|------|------|------|
|                         |                 |                                              | Min.   | Typ. | Max. |      |
| DC blocking voltage     | V <sub>DC</sub> | I <sub>R</sub> =0.2mA                        | 1200   | -    | -    | V    |
| Forward voltage         | V <sub>F</sub>  | I <sub>F</sub> =10A, T <sub>j</sub> =25°C    | -      | 1.4  | 1.6  | V    |
|                         |                 | I <sub>F</sub> =10A, T <sub>j</sub> =150°C   | -      | 1.8  | -    | V    |
|                         |                 | I <sub>F</sub> =10A, T <sub>j</sub> =175°C   | -      | 1.9  | -    | V    |
| Reverse current         | I <sub>R</sub>  | V <sub>R</sub> =1200V, T <sub>j</sub> =25°C  | -      | 10   | 200  | μA   |
|                         |                 | V <sub>R</sub> =1200V, T <sub>j</sub> =150°C | -      | 80   | -    | μA   |
|                         |                 | V <sub>R</sub> =1200V, T <sub>j</sub> =175°C | -      | 130  | -    | μA   |
| Total capacitance       | C               | V <sub>R</sub> =1V, f=1MHz                   | -      | 550  | -    | pF   |
|                         |                 | V <sub>R</sub> =800V, f=1MHz                 | -      | 42   | -    | pF   |
| Total capacitive charge | Q <sub>C</sub>  | V <sub>R</sub> =800V, di/dt=500A/μs          | -      | 34   | -    | nC   |
| Switching time          | t <sub>c</sub>  | V <sub>R</sub> =800V, di/dt=500A/μs          | -      | 15   | -    | ns   |

**●Thermal characteristics**

| Parameter          | Symbol               | Conditions | Values |      |      | Unit |
|--------------------|----------------------|------------|--------|------|------|------|
|                    |                      |            | Min.   | Typ. | Max. |      |
| Thermal resistance | R <sub>th(j-c)</sub> | Per Leg    | -      | 0.9  | 1.1  | °C/W |
|                    |                      | Both Legs  | -      | 0.45 | 0.53 | °C/W |

### ●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics (Per leg)

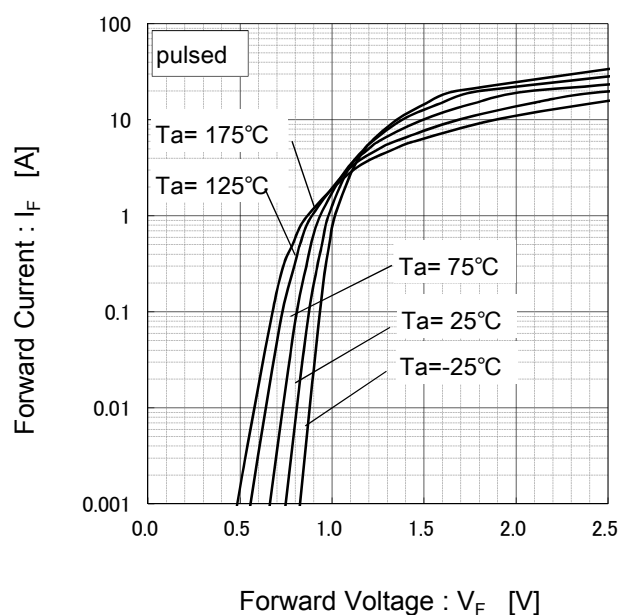


Fig.2  $V_F - I_F$  Characteristics (Per leg)

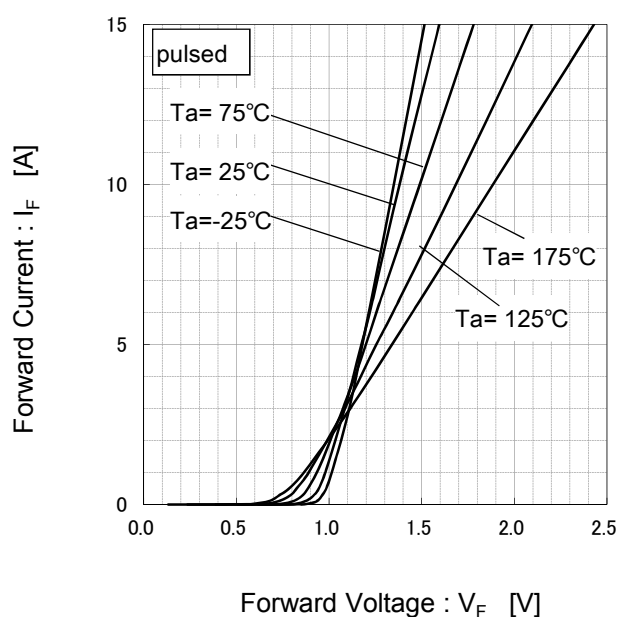


Fig.3  $V_R - I_R$  Characteristics (Per leg)

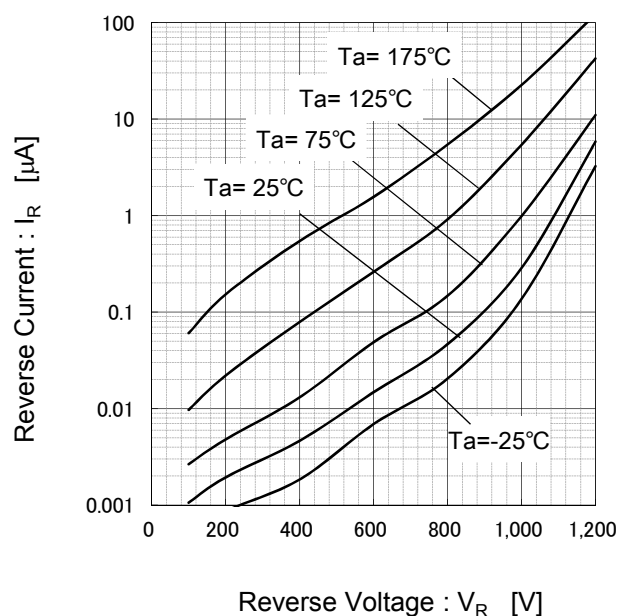
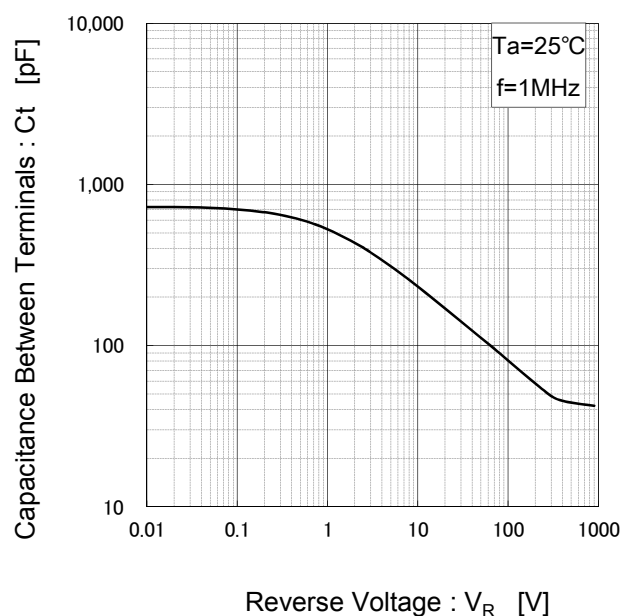


Fig.4  $V_R$ -Ct Characteristics (Per leg)



●Electrical characteristic curves

Fig.5 Thermal Resistance vs. Pulse Width (Per leg)

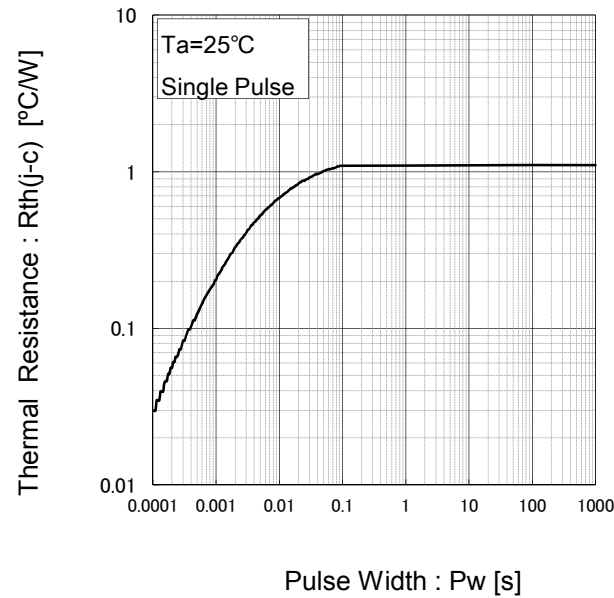


Fig.6 Power Dissipation (Per leg)

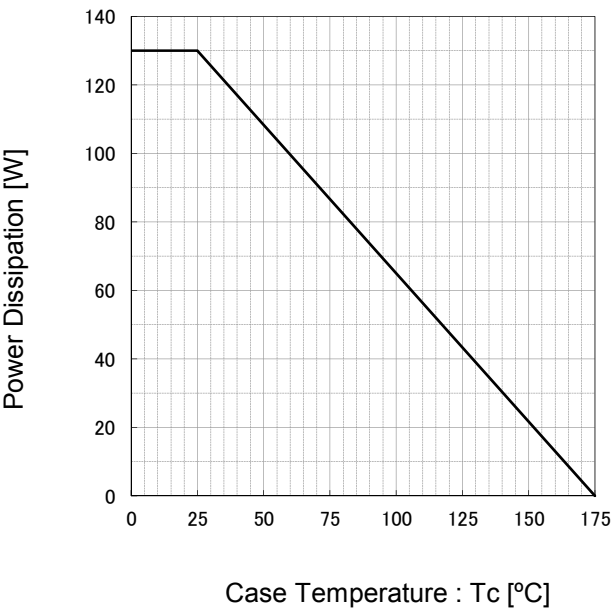


Fig.7 Derating Curve  $I_p$ - $T_c$  (Per leg)

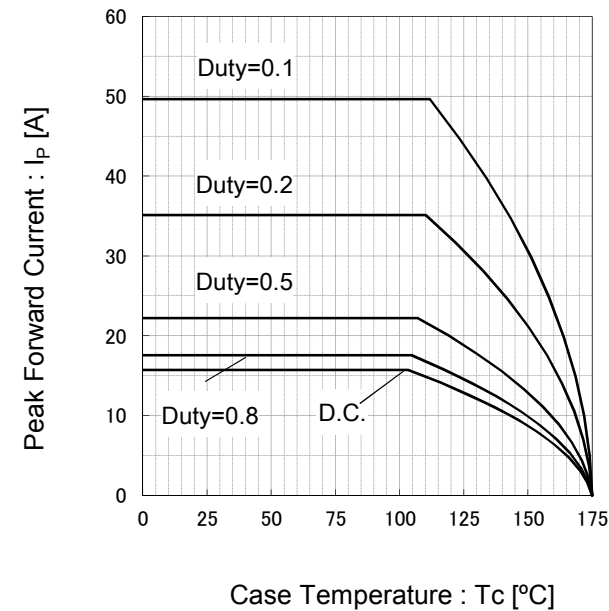
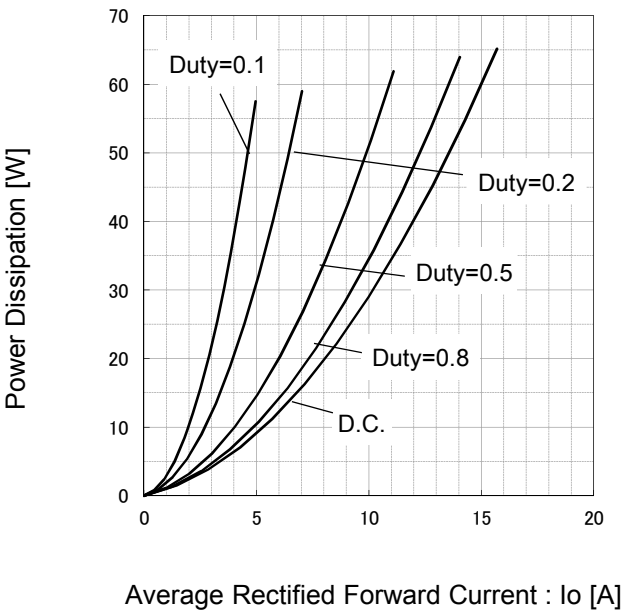
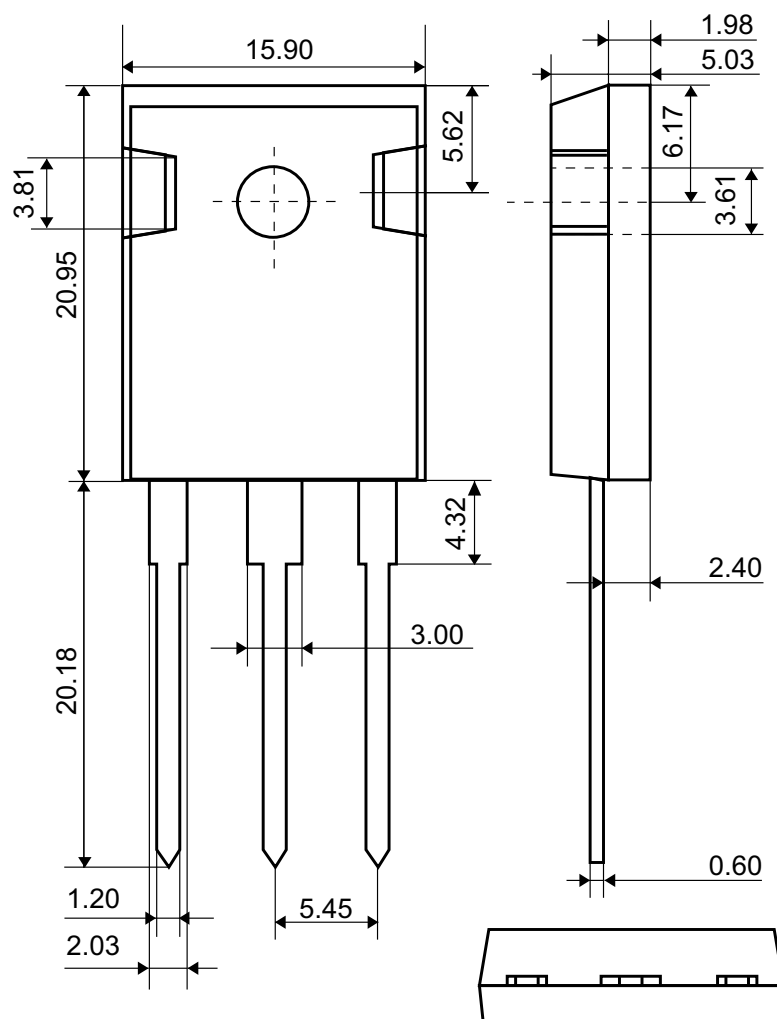


Fig.8  $I_o$ - $P_f$  Characteristics (Per leg)



## ●Dimensions (Unit : mm)

## TO-247



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## SCS220KE2 - Web Page

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|                             |           |
|-----------------------------|-----------|
| Part Number                 | SCS220KE2 |
| Package                     | TO-247    |
| Unit Quantity               | 360       |
| Minimum Package Quantity    | 30        |
| Packing Type                | Tube      |
| Constitution Materials List | inquiry   |
| RoHS                        | Yes       |