

|       |          |
|-------|----------|
| $V_R$ | 650V     |
| $I_F$ | 10A/20A* |
| $Q_C$ | 15nC     |

\*(Per leg / Both legs)

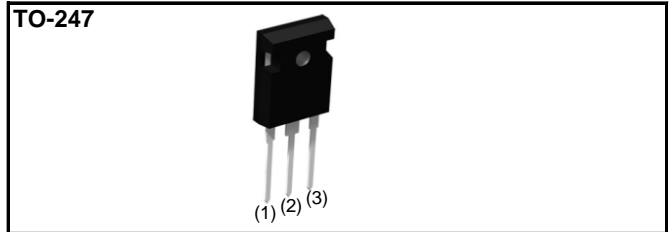
### ●Features

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

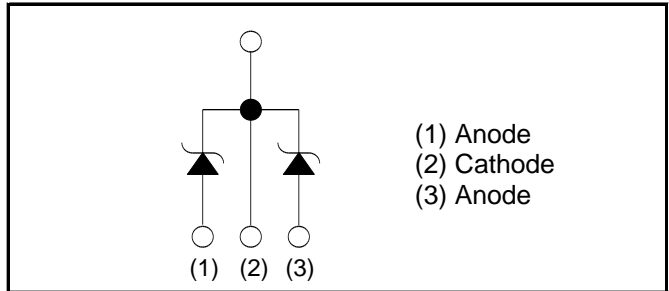
### ●Construction

Silicon carbide epitaxial planer type

### ●Outline



### ●Inner circuit



### ●Packaging specifications

| Type | Packaging                 | Tube      |
|------|---------------------------|-----------|
|      | Reel size (mm)            | -         |
|      | Tape width (mm)           | -         |
|      | Basic ordering unit (pcs) | 30        |
|      | Taping code               | C         |
|      | Marking                   | SCS220AE2 |

### ●Absolute maximum ratings (Tj = 25°C)

| Parameter   | Symbol    | Value                 | Unit |
|---|-----------|-----------------------|------|
| Reverse voltage (repetitive peak)                 | $V_{RM}$  | 650                   | V    |
| Reverse voltage (DC)                              | $V_R$     | 650                   | V    |
| Continuous forward current <sup>*7</sup>          | $I_F$     | 10/20 <sup>*1</sup>   | A    |
| Surge no repetitive forward current <sup>*7</sup> | $I_{FSM}$ | 40/80 <sup>*2</sup>   | A    |
|   |           | 150/300 <sup>*3</sup> | A    |
|   |           | 31/63 <sup>*4</sup>   | A    |
| Repetitive peak forward current <sup>*7</sup>     | $I_{FRM}$ | 42/85 <sup>*5</sup>   | A    |
| Total power dissipation <sup>*7</sup>             | $P_D$     | 83/160 <sup>*6</sup>  | W    |
| Junction temperature                              | Tj        | 175                   | °C   |
| Range of storage temperature                      | Tstg      | -55 to +175           | °C   |

\*1 Tc=137°C/Tc=137°C \*2 PW=8.3ms sinusoidal, Tj=25°C \*3 PW=10μs square, Tj=25°C

\*4 PW=8.3ms sinusoidal, Tj=150°C \*5 Tc=100°C, Tj=150°C, Duty cycle=10%

\*6 Tc=25°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                       | 600    | -    | -    | V    |
| Forward voltage         | V <sub>F</sub>  | I <sub>F</sub> =10A, T <sub>j</sub> =25°C   | -      | 1.35 | 1.55 | V    |
|                         |                 | I <sub>F</sub> =10A, T <sub>j</sub> =150°C  | -      | 1.55 | -    | V    |
|                         |                 | I <sub>F</sub> =10A, T <sub>j</sub> =175°C  | -      | 1.63 | -    | V    |
| Reverse current         | I <sub>R</sub>  | V <sub>R</sub> =600V, T <sub>j</sub> =25°C  | -      | 2    | 200  | μA   |
|                         |                 | V <sub>R</sub> =600V, T <sub>j</sub> =150°C | -      | 30   | -    | μA   |
|                         |                 | V <sub>R</sub> =600V, T <sub>j</sub> =175°C | -      | 70   | -    | μA   |
| Total capacitance       | C               | V <sub>R</sub> =1V, f=1MHz                  | -      | 365  | -    | pF   |
|                         |                 | V <sub>R</sub> =600V, f=1MHz                | -      | 37   | -    | pF   |
| Total capacitive charge | Q <sub>C</sub>  | V <sub>R</sub> =400V, di/dt=350A/μs         | -      | 15   | -    | nC   |
| Switching time          | t <sub>c</sub>  | V <sub>R</sub> =400V, di/dt=350A/μs         | -      | 15   | -    | ns   |

**●Thermal characteristics**

| Parameter          | Symbol               | Conditions | Values |      |      | Unit |
|--------------------|----------------------|------------|--------|------|------|------|
|                    |                      |            | Min.   | Typ. | Max. |      |
| Thermal resistance | R <sub>th(j-c)</sub> | Per Leg    | -      | 1.6  | 1.8  | °C/W |
|                    |                      | Both Legs  | -      | 0.8  | 0.9  | °C/W |

●Electrical characteristic curves

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

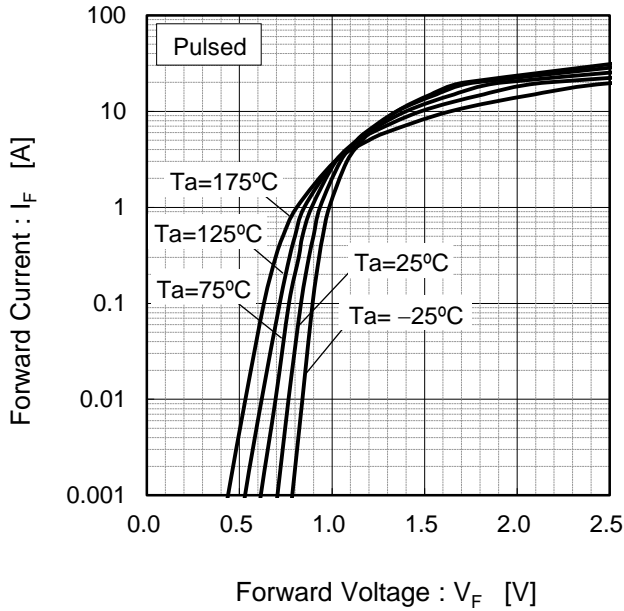


Fig.2  $V_F - I_F$  Characteristics (Per leg)

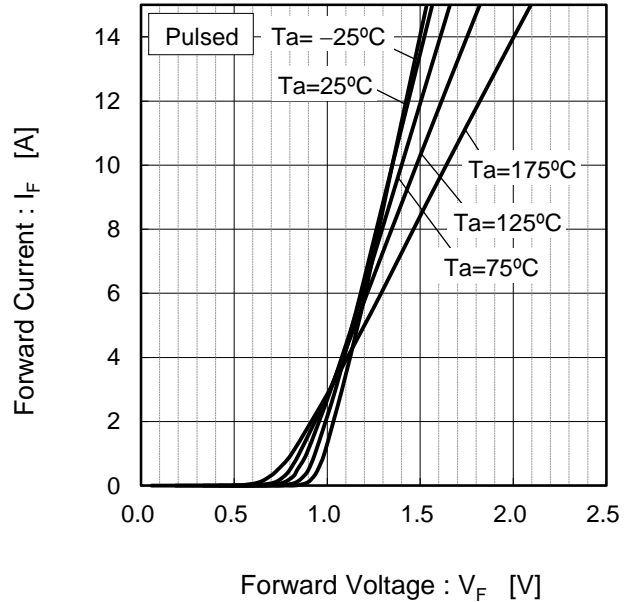


Fig.3  $V_R - I_R$  Characteristics (Per leg)

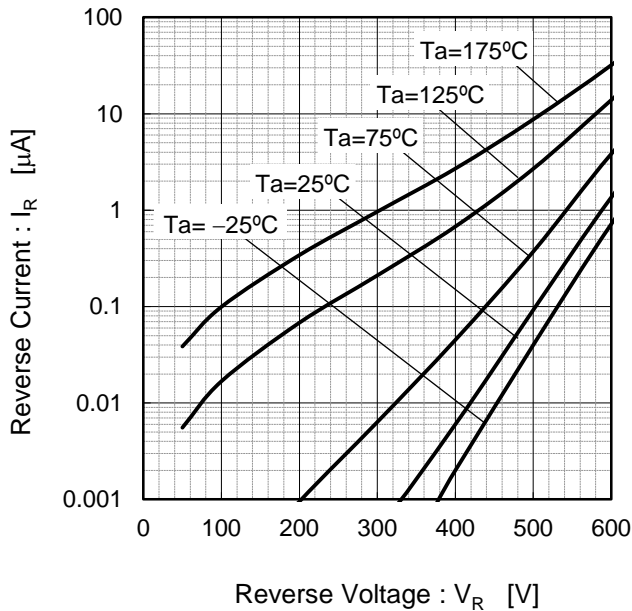
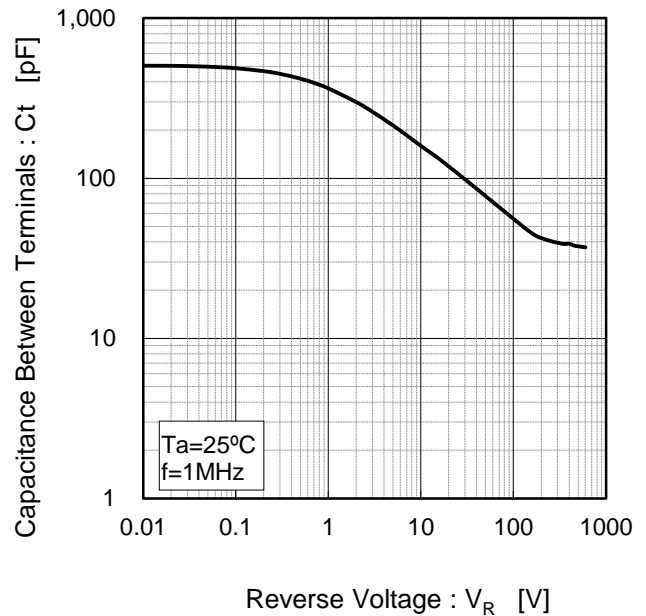


Fig.4  $V_R - C_t$  Characteristics (Per leg)



●Electrical characteristic curves

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

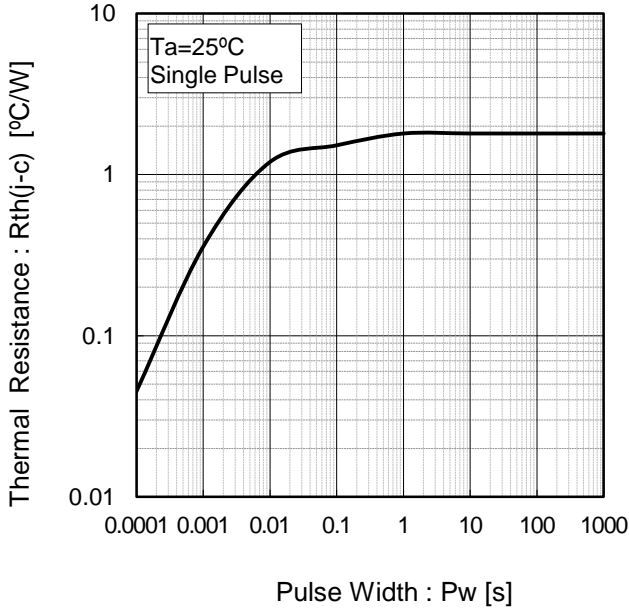


Fig.6 Power Dissipation (Per leg)

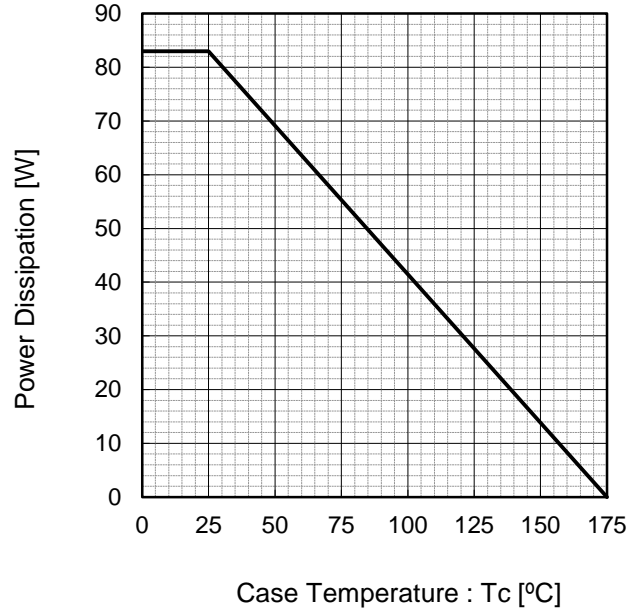


Fig.7 Derating Curve Ip-Tc (Per leg)

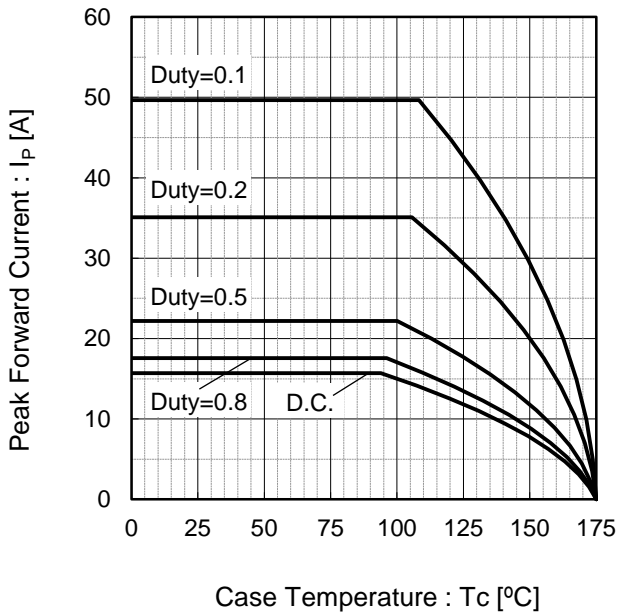
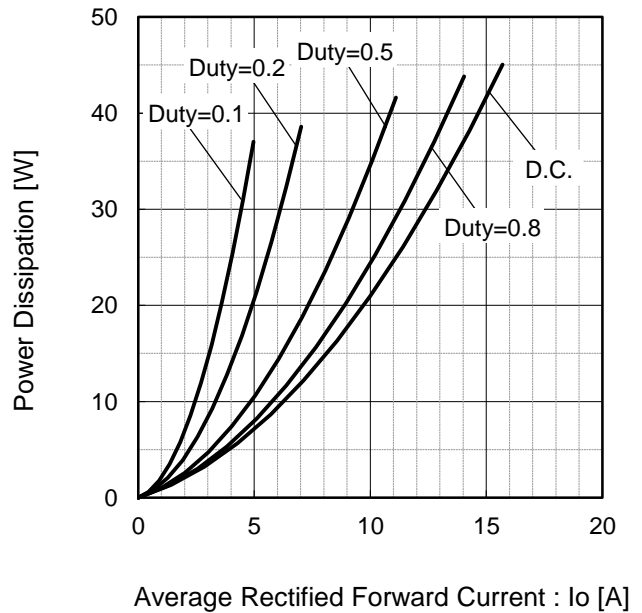
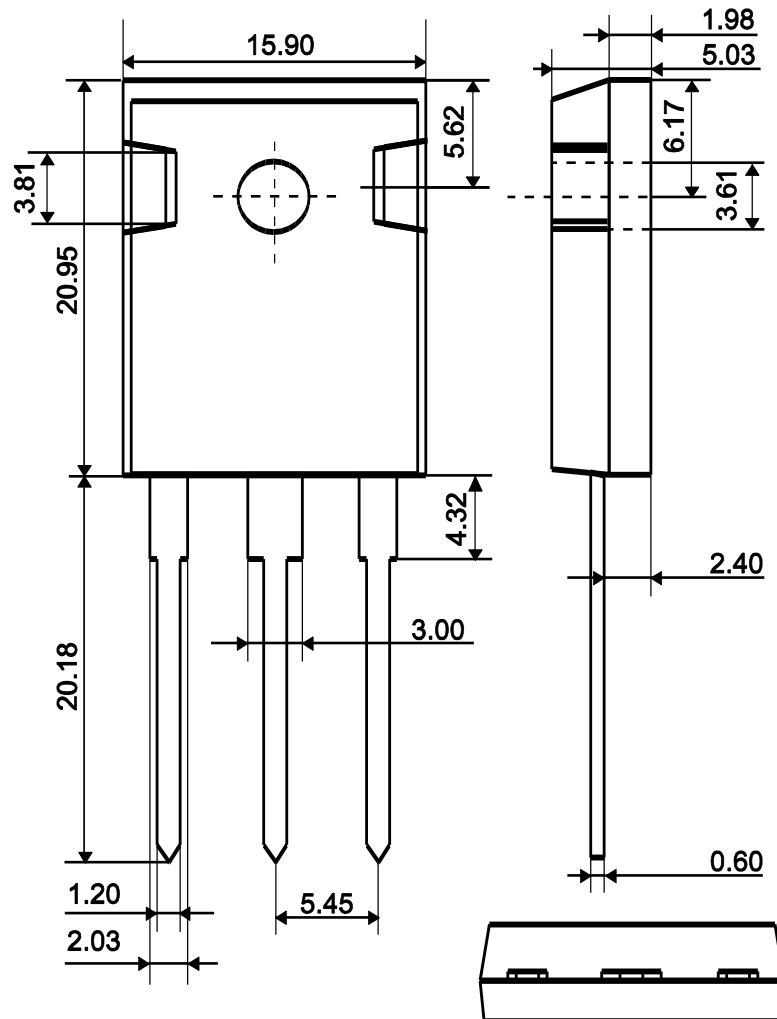


Fig.8 Io-Pf Characteristics (Per leg)



## ●Dimensions (Unit : mm)

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