

|       |      |
|-------|------|
| $V_R$ | 650V |
| $I_F$ | 12A  |
| $Q_C$ | 18nC |

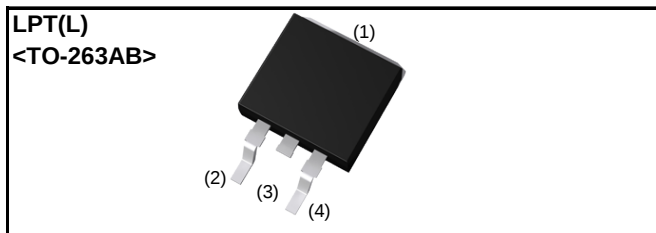
### ●Features

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

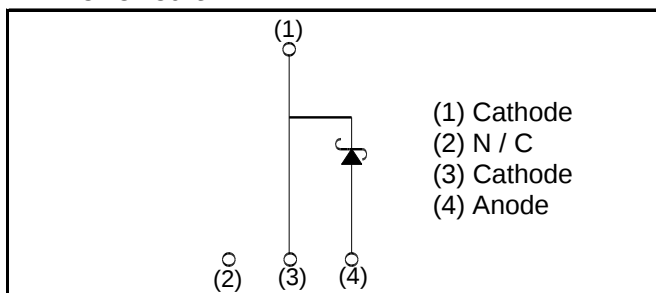
### ●Construction

Silicon carbide epitaxial planer type

### ●Outline



### ●Inner circuit



### ●Packaging specifications

|      |                           |               |
|------|---------------------------|---------------|
| Type | Packaging                 | Embossed tape |
|      | Reel size (mm)            | 330           |
|      | Tape width (mm)           | 24            |
|      | Basic ordering unit (pcs) | 1,000         |
|      | Taping code               | TLL           |
|      | Marking                   | SCS212AJ      |

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

| Parameter                           | Symbol    | Value             | Unit             |
|-------------------------------------|-----------|-------------------|------------------|
| Reverse voltage (repetitive peak)   | $V_{RM}$  | 650               | V                |
| Reverse voltage (DC)                | $V_R$     | 650               | V                |
| Continuous forward current          | $I_F$     | 12 <sup>*1</sup>  | A                |
| Surge no repetitive forward current | $I_{FSM}$ | 45 <sup>*2</sup>  | A                |
|                                     |           | 170 <sup>*3</sup> | A                |
|                                     |           | 36 <sup>*4</sup>  | A                |
| Repetitive peak forward current     | $I_{FRM}$ | 47 <sup>*5</sup>  | A                |
| Total power dissipation             | $P_D$     | 88 <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  $T_c=130^\circ\text{C}$  \*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 ( $T_j = 25^\circ\text{C}$ )**

| Parameter               | Symbol   | Conditions                                           | Values |      |      | Unit          |
|-------------------------|----------|------------------------------------------------------|--------|------|------|---------------|
|                         |          |                                                      | Min.   | Typ. | Max. |               |
| DC blocking voltage     | $V_{DC}$ | $I_R = 0.24\text{mA}$                                | 600    | -    | -    | V             |
| Forward voltage         | $V_F$    | $I_F = 12\text{A}, T_j = 25^\circ\text{C}$           | -      | 1.35 | 1.55 | V             |
|                         |          | $I_F = 12\text{A}, T_j = 150^\circ\text{C}$          | -      | 1.55 | -    | V             |
|                         |          | $I_F = 12\text{A}, T_j = 175^\circ\text{C}$          | -      | 1.63 | -    | V             |
| Reverse current         | $I_R$    | $V_R = 600\text{V}, T_j = 25^\circ\text{C}$          | -      | 2.4  | 240  | $\mu\text{A}$ |
|                         |          | $V_R = 600\text{V}, T_j = 150^\circ\text{C}$         | -      | 36   | -    | $\mu\text{A}$ |
|                         |          | $V_R = 600\text{V}, T_j = 175^\circ\text{C}$         | -      | 84   | -    | $\mu\text{A}$ |
| Total capacitance       | $C_t$    | $V_R = 1\text{V}, f = 1\text{MHz}$                   | -      | 438  | -    | pF            |
|                         |          | $V_R = 600\text{V}, f = 1\text{MHz}$                 | -      | 44   | -    | pF            |
| Total capacitive charge | $Q_c$    | $V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$ | -      | 18   | -    | nC            |
| Switching time          | $t_c$    | $V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$ | -      | 16   | -    | ns            |

**●Thermal characteristics**

| Parameter          | Symbol        | Conditions | Values |      |      | Unit                      |
|--------------------|---------------|------------|--------|------|------|---------------------------|
|                    |               |            | Min.   | Typ. | Max. |                           |
| Thermal resistance | $R_{th(j-c)}$ | -          | -      | 1.4  | 1.7  | $^\circ\text{C}/\text{W}$ |

●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

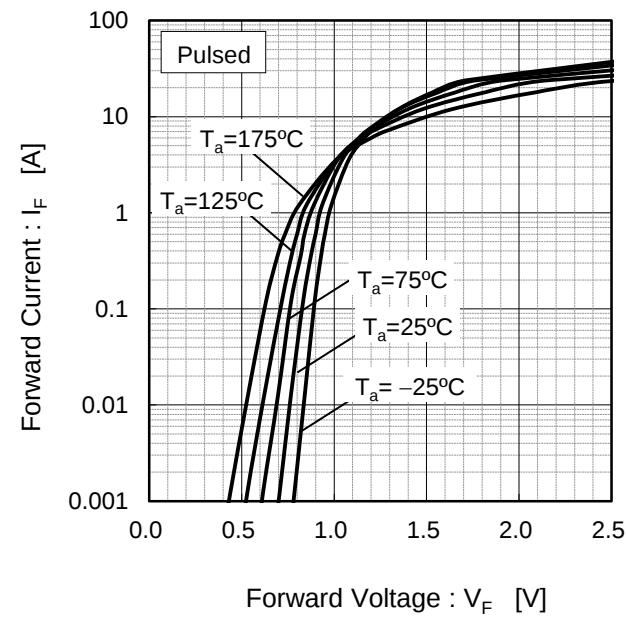


Fig.2  $V_F - I_F$  Characteristics

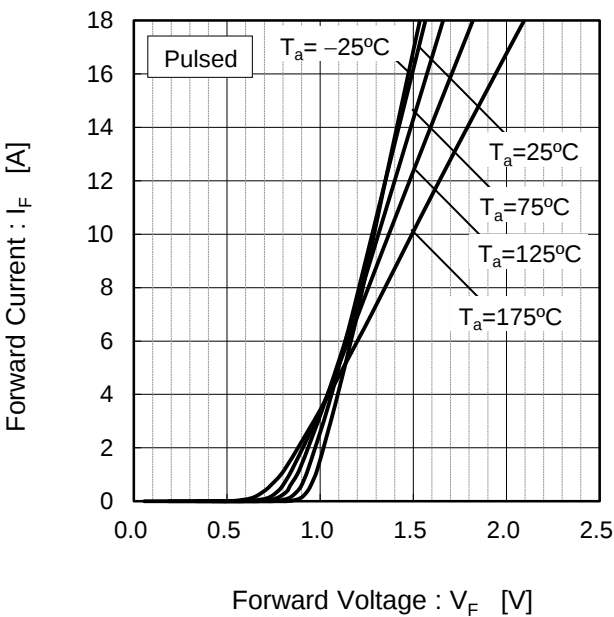


Fig.3  $V_R - I_R$  Characteristics

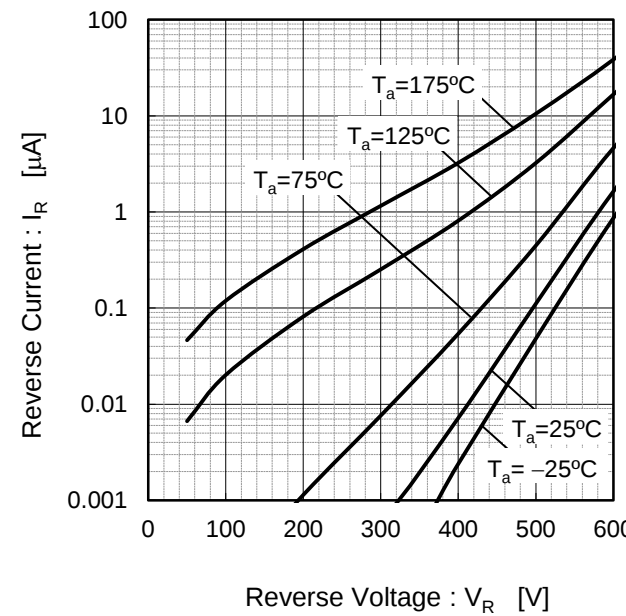
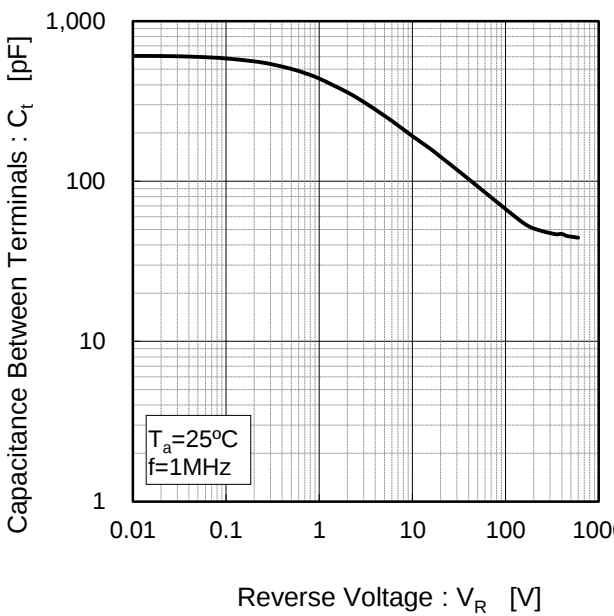


Fig.4  $V_R - C_t$  Characteristics



●Electrical characteristic curves

Fig.5 Thermal Resistance vs. Pulse Width

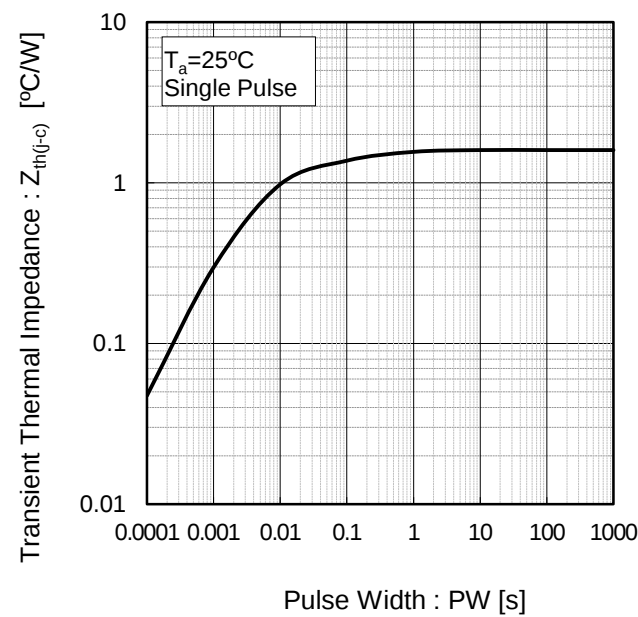


Fig.6 Power Dissipation

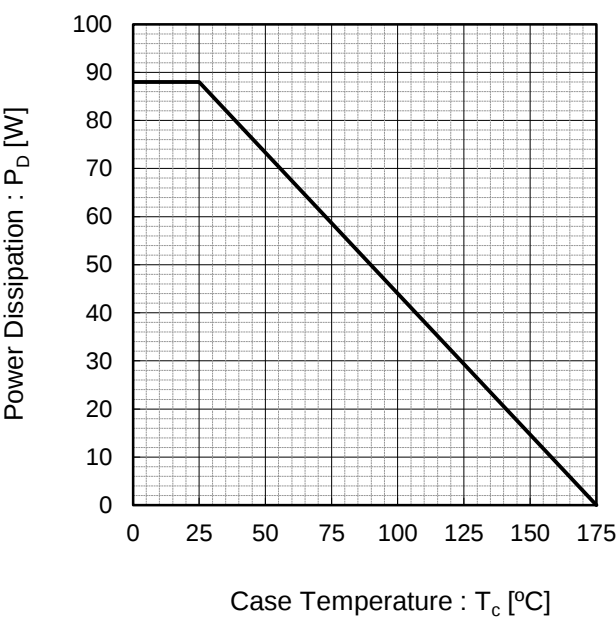


Fig.7  $I_P$ - $T_c$  Derating Curve

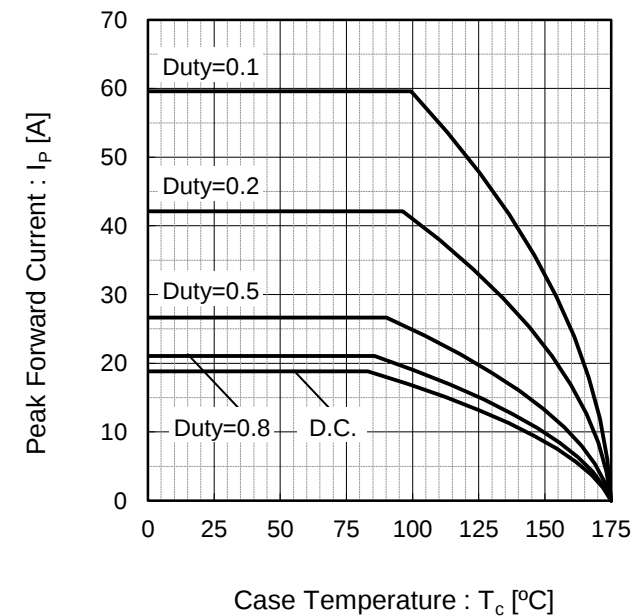
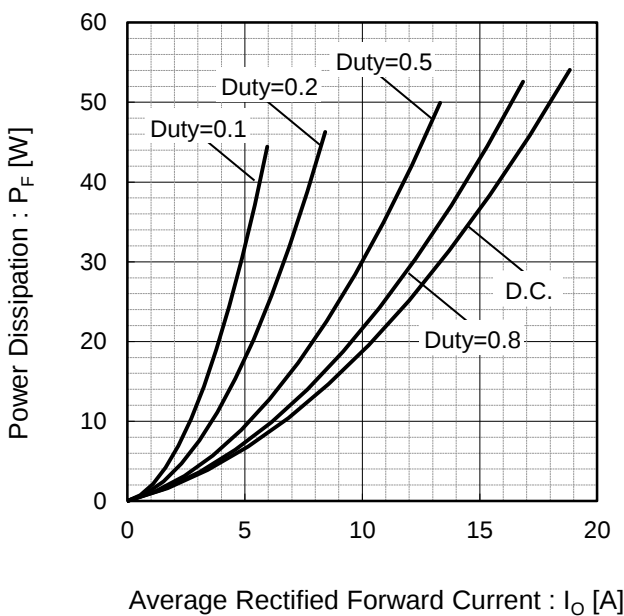
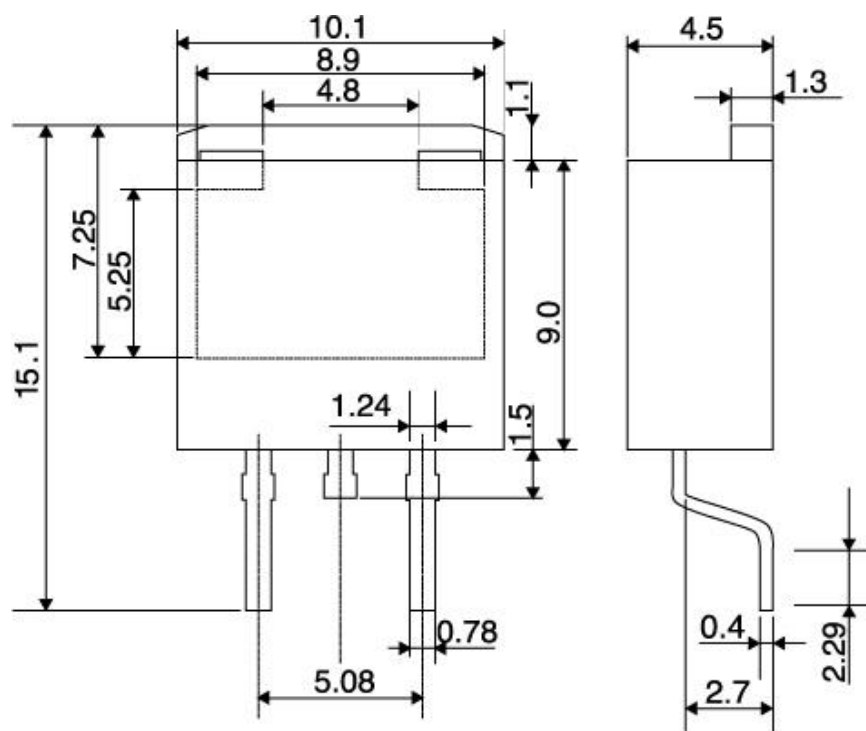


Fig.8  $I_O$ - $P_F$  Characteristics



## ●Dimensions (Unit : mm)

LPT(L)



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