

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

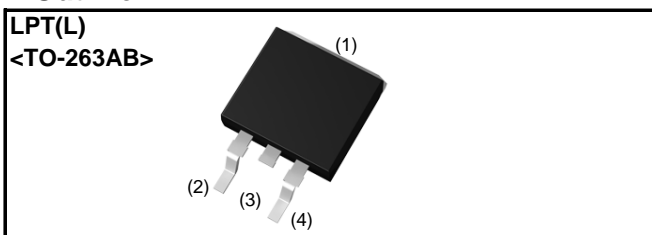
●Features

- 1) AEC-Q101 qualified
- 2) Low forward voltage
- 3) Negligible recovery time/current
- 4) Temperature independent switching behavior

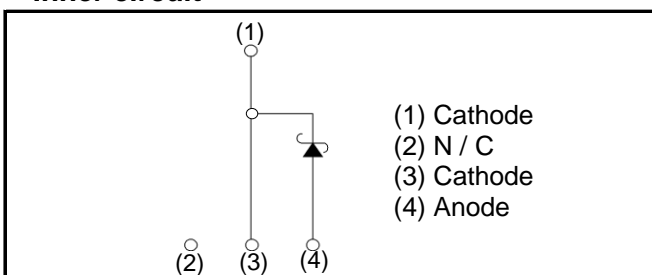
●Applications

- On Board Charger
- DC/DC Converter
- Wireless Charger
- EV Charger

●Outline



●Inner circuit



●Packaging specifications

| | | |
|------|---------------------------|---------------|
| Type | Packaging | Embossed tape |
| | Reel size (mm) | 330 |
| | Tape width (mm) | 24 |
| | Basic ordering unit (pcs) | 1 000 |
| | Packing 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 ($T_c = 132^\circ\text{C}$) | | I_F | 12 | A |
| Surge non-repetitive forward current | PW=10ms sinusoidal, $T_j=25^\circ\text{C}$ | I_{FSM} | 43 | A |
| | PW=10ms sinusoidal, $T_j=150^\circ\text{C}$ | | 34 | A |
| | PW=10μs square, $T_j=25^\circ\text{C}$ | | 170 | A |
| Repetitive peak forward current | | I_{FRM} | 51 ^{*1} | A |
| i^2t value | PW=10ms, $T_j=25^\circ\text{C}$ | $\int i^2 dt$ | 9.2 | A ² s |
| | PW=10ms, $T_j=150^\circ\text{C}$ | | 5.7 | A ² s |
| Total power dissipation | | P_D | 88 ^{*2} | W |
| Junction temperature | | T_j | 175 | °C |
| Range of storage temperature | | T_{stg} | -55 to +175 | °C |

*1 $T_c=100^\circ\text{C}$, $T_j=150^\circ\text{C}$, Duty cycle=10% *2 $T_c=25^\circ\text{C}$

●Electrical characteristics ($T_j = 25^\circ\text{C}$)

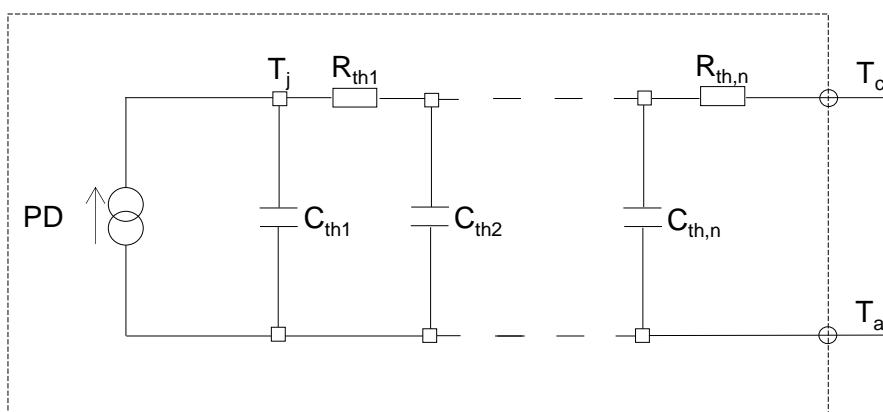
| Parameter | Symbol | Conditions | Values | | | Unit |
|-------------------------|----------|--|--------|------|------|---------------|
| | | | Min. | Typ. | Max. | |
| DC blocking voltage | V_{DC} | $I_R = 2.4\text{mA}$ | 650 | - | - | V |
| Forward voltage | V_F | $I_F = 12\text{A}, T_j = 25^\circ\text{C}$ | - | 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 | μA |
| | | $V_R = 600\text{V}, T_j = 150^\circ\text{C}$ | - | 36 | - | μA |
| | | $V_R = 600\text{V}, T_j = 175^\circ\text{C}$ | - | 84 | - | μA |
| Total capacitance | C | $V_R = 1\text{V}, f = 1\text{MHz}$ | - | 440 | - | 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

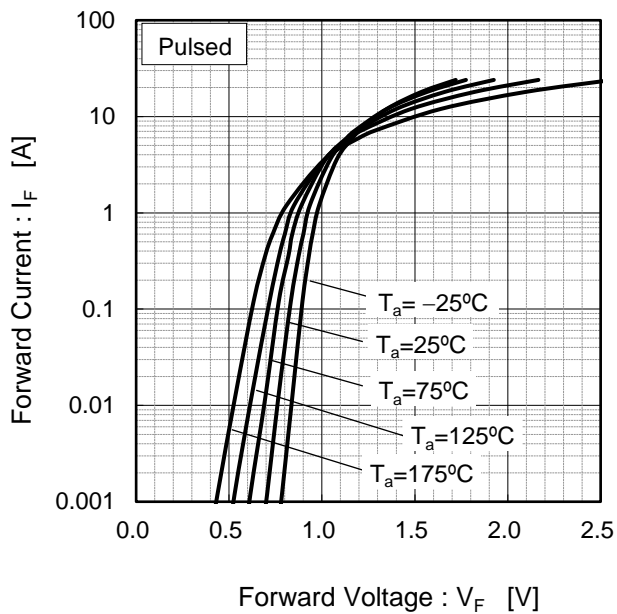
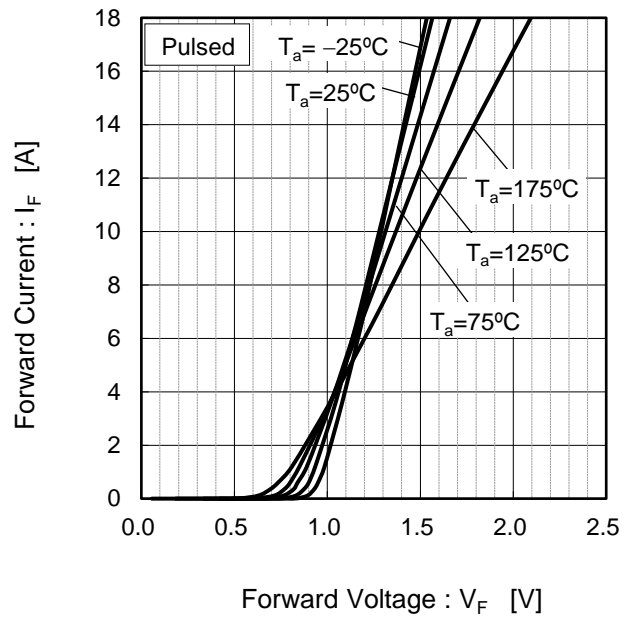
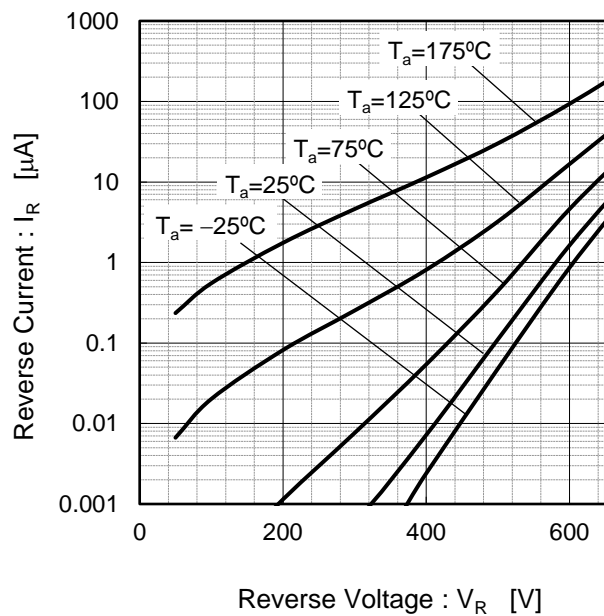
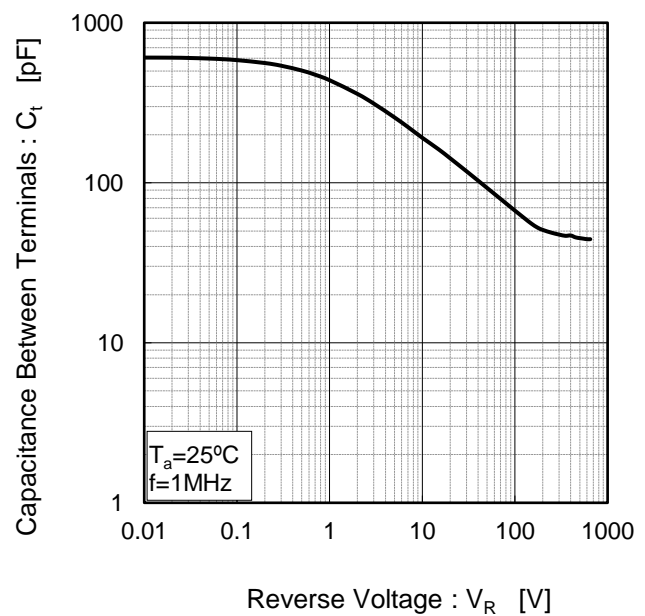
| Parameter | Symbol | Conditions | Values | | | Unit |
|--------------------|---------------|------------|--------|------|------|---------------------------|
| | | | Min. | Typ. | Max. | |
| Thermal resistance | $R_{th(j-c)}$ | - | - | 1.4 | 1.7 | $^\circ\text{C}/\text{W}$ |

●Typical Transient Thermal Characteristics

| Symbol | Value | Unit | Symbol | Value | Unit |
|-----------|----------|------|-----------|----------|------|
| R_{th1} | 1.56E-01 | K/W | C_{th1} | 1.81E-03 | Ws/K |
| R_{th2} | 7.96E-01 | | C_{th2} | 1.65E-03 | |
| R_{th3} | 4.48E-01 | | C_{th3} | 6.83E-02 | |



●Electrical characteristic curves

Fig.1 $V_F - I_F$ CharacteristicsFig.2 $V_F - I_F$ CharacteristicsFig.3 $V_R - I_R$ CharacteristicsFig.4 $V_R - C_t$ Characteristics

●Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

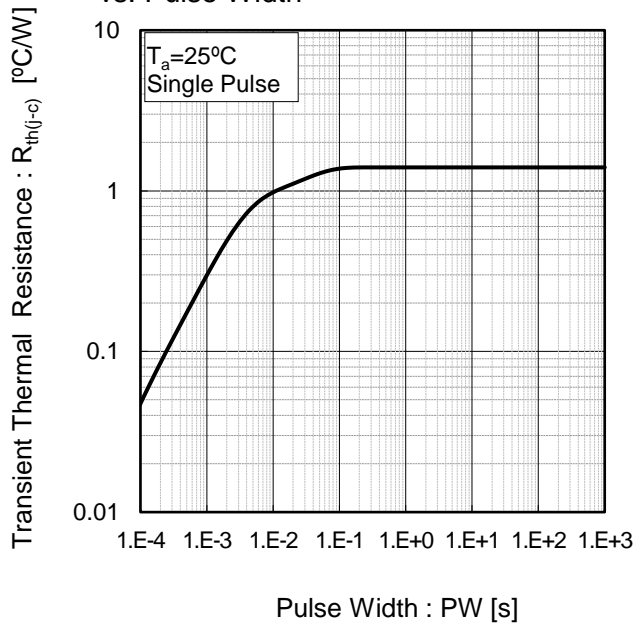


Fig.6 Power Dissipation

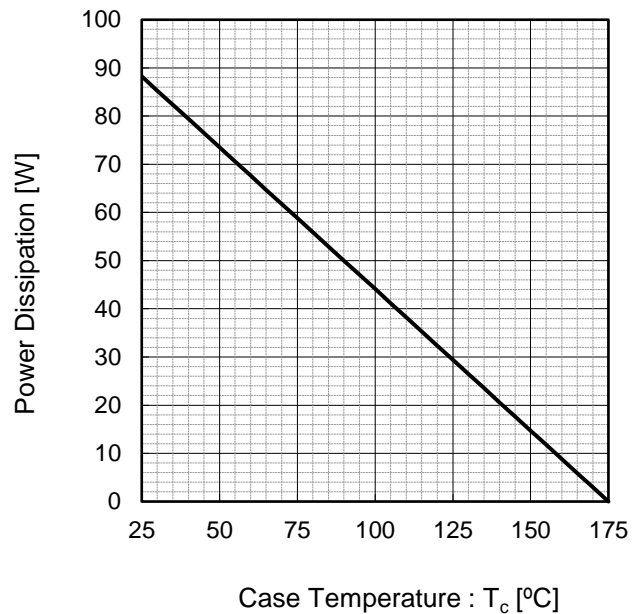
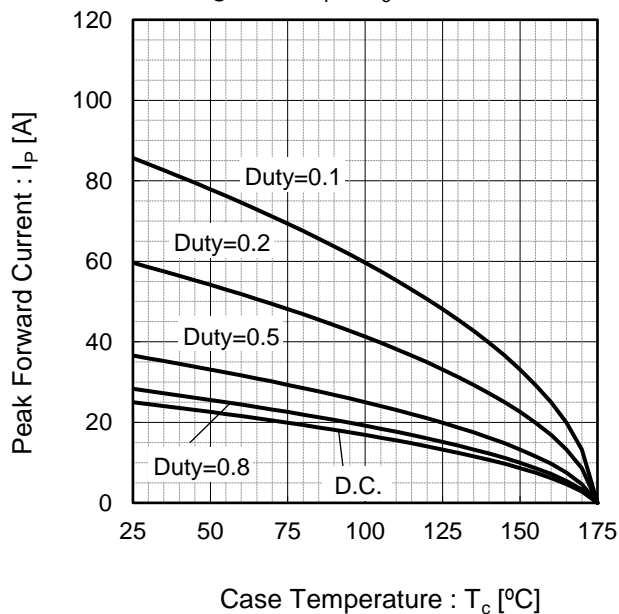
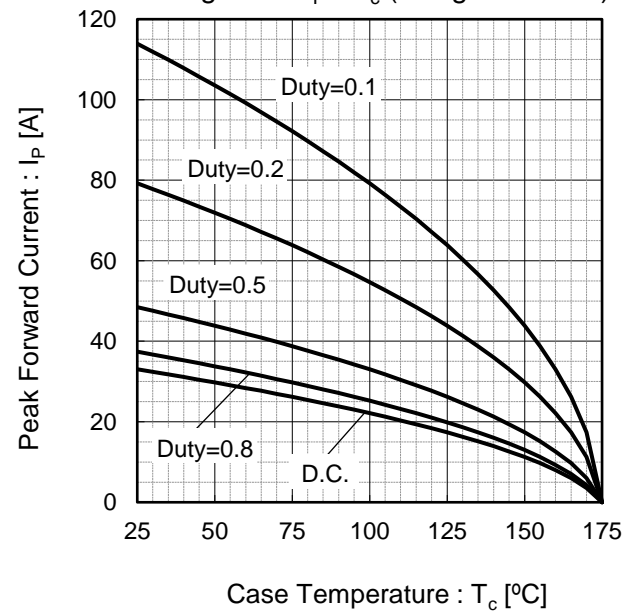


Fig.7*3 Maximum peak forward current derating curve $I_P - T_c$



*3 Based on max V_f , max $R_{th(j-c)}$
Valid for switching of above 10kHz,
excluding D.C. curve.

Fig.8*4 Typical peak forward current derating curve $I_P - T_c$ (Not guaranteed)



*4 Based on typ V_f , typ $R_{th(j-c)}$
Typical value, not guaranteed
Valid for switching of above 10kHz,
excluding D.C. curve

●Electrical characteristic curves

Fig.9 Surge non-repetitive forward current vs. Pulse width (Sinusoidal waveform)

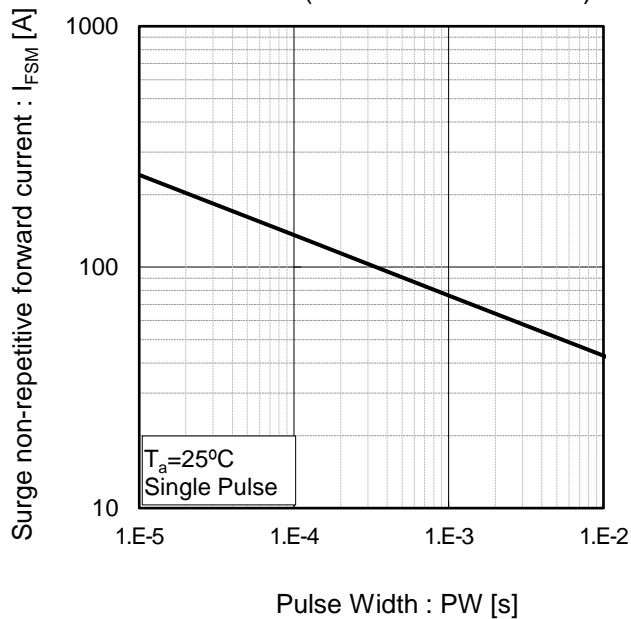
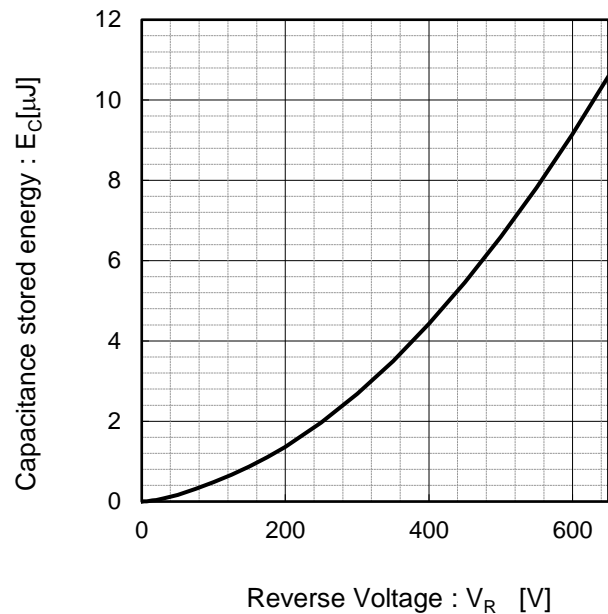


Fig.10 Typical capacitance store energy



●Simplified forward characteristic model

Fig.11 Equivalent forward current curve



$$V_F = V_{th} + R_{diff} I_F$$

$$V_{th}(T_j) = a_0 + a_1 T_j$$

$$R_{diff}(T_j) = b_0 + b_1 T_j + b_2 T_j^2$$

| Symbol | Typical Value | Unit |
|--------|---------------|-------------------|
| a_0 | 9.35E-01 | V |
| a_1 | -1.12E-03 | V/°C |
| b_0 | 3.32E-02 | Ω |
| b_1 | 8.50E-05 | Ω/°C |
| b_2 | 9.00E-07 | Ω/°C ² |

T_j in °C; $-55^\circ\text{C} < T_j < 0^\circ\text{C}$; $I_F < 24\text{ A}$

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SCS212AJHR - Web Page

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| | |
|-----------------------------|-----------------|
| Part Number | SCS212AJHR |
| Package | TO-263AB (LPTL) |
| Unit Quantity | 1000 |
| Minimum Package Quantity | 1000 |
| Packing Type | Taping |
| Constitution Materials List | inquiry |
| RoHS | Yes |