

SCS215KG

SiC Schottky Barrier Diode

| V _R | 1200V |
|----------------|-------|
| I _F | 15A |
| Q _C | 51nC |

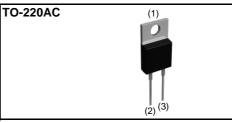
Features

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

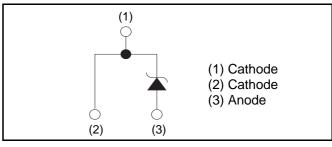
Applications

- PFC Boost Topology
- Secondary Side Rectification
- Data Center
- PV Power Conditioners

●Outline



Inner circuit



Packaging specifications

| | Packaging | Tube |
|------|---------------------------|----------|
| | Reel size (mm) | - |
| Tuno | Tape width (mm) | - |
| Туре | Basic ordering unit (pcs) | 50 |
| | Packing code | С |
| | Marking | SCS215KG |

•Absolute maximum ratings $(T_j = 25^{\circ}C)$

| Parameter | | Symbol | Value | Unit |
|-------------------------|---|---------------------|-------------------|------------------|
| Reverse voltage (re | petitive peak) | V _{RM} | 1200 | V |
| Reverse voltage (De | C) | V _R | 1200 | V |
| Continuous forward | current $(T_c= 140^{\circ}C)$ | I _F | 15 | А |
| Surge non- | PW=10ms sinusoidal, T _j =25°C | | 62 | А |
| repetitive forward | PW=10ms sinusoidal, T _j =150°C | I _{FSM} | 46 | А |
| current | PW=10µs square, T _j =25°C | | 240 | А |
| Repetitive peak for | ward current | I _{FRM} | 68 ^{*1} | А |
| 2 | PW=10ms, T _j =25°C | f .2 | 19 | A ² s |
| i ² t value | PW=10ms, T _j =150°C | ∫ i ² dt | 11 | A ² s |
| Total power dissipation | | P _D | 180 ^{*2} | W |
| Junction temperature | | Τ _j | 175 | °C |
| Range of storage te | emperature | T _{stg} | –55 to +175 | °C |

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

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

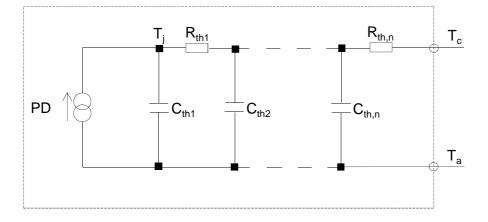
| Deremeter | Symbol | Conditions | Values | | | 1 10:4 |
|-------------------------|-----------------|---|--------|------|------|--------|
| Parameter | | Conditions | Min. | Тур. | Max. | Unit |
| DC blocking voltage | V _{DC} | I _R =0.3mA | 1200 | - | - | V |
| | | I _F =15A,T _j =25°C | - | 1.4 | 1.6 | V |
| Forward voltage | | I _F =15A,T _j =150°C | - | 1.8 | - | V |
| | | I _F =15A,T _j =175°C | - | 1.9 | - | V |
| | I _R | V _R =1200V,T _j =25°C | - | 15 | 300 | μA |
| Reverse current | | V _R =1200V,T _j =150°C | - | 120 | - | μA |
| | | V _R =1200V,T _j =175°C | - | 195 | - | μA |
| Total conscitance | С | V _R =1V,f=1MHz | - | 790 | - | pF |
| Total capacitance | | V _R =800V,f=1MHz | - | 64 | - | pF |
| Total capacitive charge | Q _C | V _R =800V,di/dt=500A/μs | - | 51 | - | nC |
| Switching time | t _C | V _R =800V,di/dt=500A/μs | - | 18 | - | ns |

•Thermal characteristics

| Parameter | Symbol | Conditions | Values | | | Unit |
|--------------------|----------------------|------------|--------|------|------|-------|
| | | | Min. | Тур. | Max. | Offic |
| Thermal resistance | R _{th(j-c)} | - | - | 0.67 | 0.80 | °C/W |

•Typical Transient Thermal Characteristics

| Symbol | Value | Unit | Symbol | Value | Unit |
|------------------|----------|------|------------------|----------|------|
| R _{th1} | 1.24E-01 | | C _{th1} | 3.81E-03 | |
| R _{th2} | 3.92E-01 | K/W | C _{th2} | 4.44E-03 | Ws/K |
| R _{th3} | 1.54E-01 | | C _{th3} | 6.02E-02 | |





•Electrical characteristic curves



Fig.2 V_F - I_F Characteristics

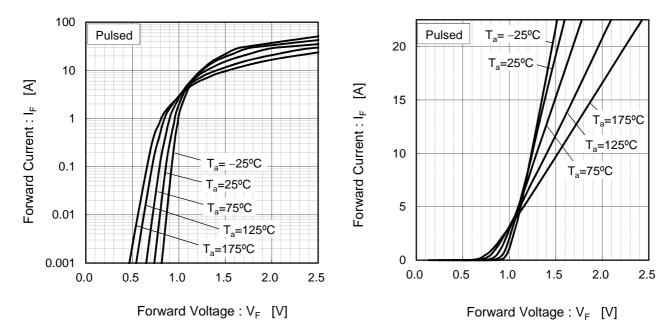
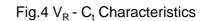
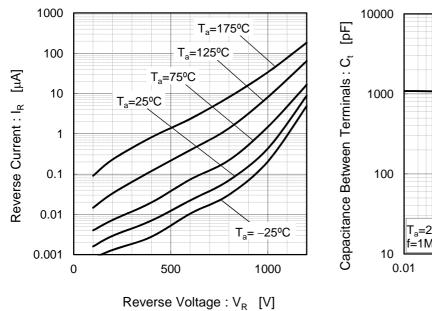
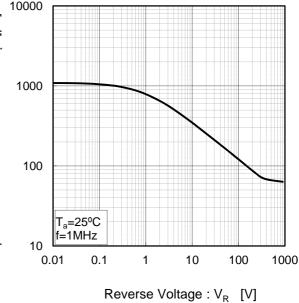


Fig.3 V_R - I_R Characteristics

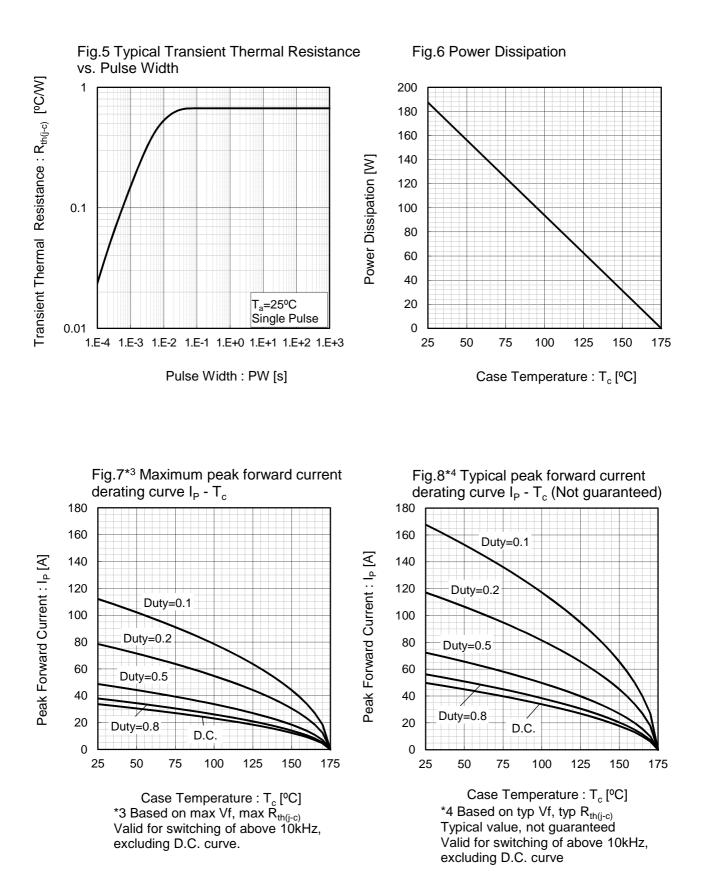






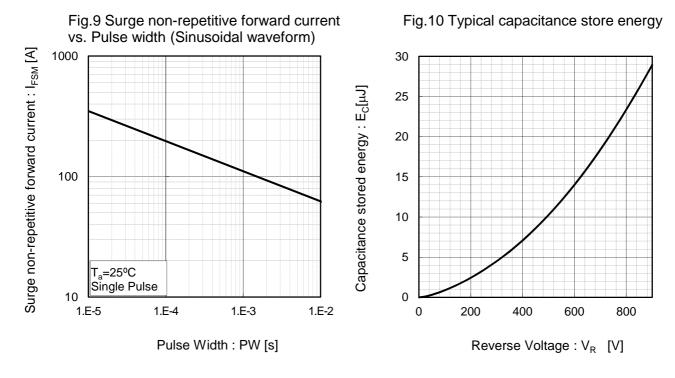


•Electrical characteristic curves

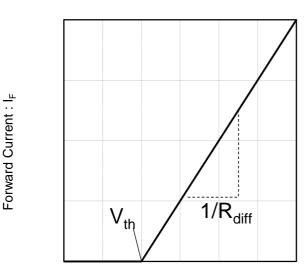




•Electrical characteristic curves



•Symplified forward characteristic model



Forward Voltage : V_F

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

| $V_{th}(T_{j}) = a_0 + a_1 T_{j}$ | |
|--|---------|
| $R_{diff} (T_j) = b_0 + b_1 T_j + b_2 T_j$ | -2 j |

| Symbol | Typical Value | Unit |
|----------------|---------------|------------------------|
| a ₀ | 9.93E-01 | V |
| a ₁ | -1.27E-03 | V/°C |
| b ₀ | 2.43E-02 | Ω |
| b ₁ | 1.37E-04 | Ω/°C |
| b ₂ | 8.87E-07 | $\Omega/^{\circ}C^{2}$ |

 $T_i \text{ in } {}^\circ\text{C}; -55 \, {}^\circ\text{C} < T_i < {}^\circ\text{C}; I_F < 30 \text{ A}$

Fig.11 Equivalent forward current curve



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