

$V_R$	1200V
$I_F$	5A
$Q_C$	17nC

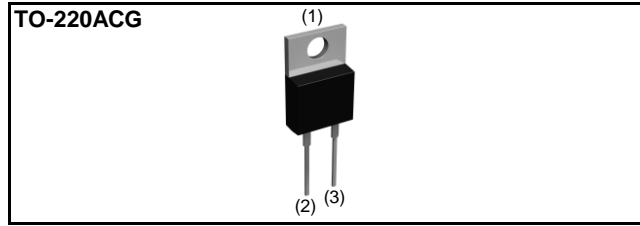
#### ●Features

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

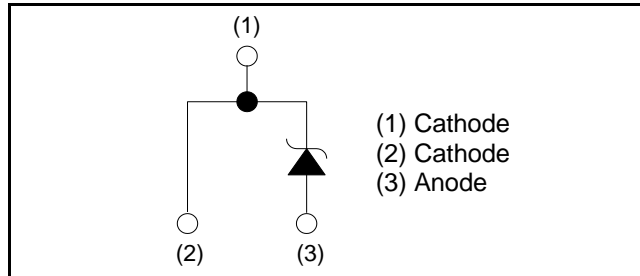
#### ●Applications

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

#### ●Outline



#### ●Inner circuit



#### ●Packaging specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	50
	Packing code	C17
	Marking	SCS205KG

#### ●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 ( $T_c = 150^\circ\text{C}$ )	$I_F$	5	A	
Surge non-repetitive forward current	$I_{FSM}$	PW=10ms sinusoidal, $T_j=25^\circ\text{C}$	23	A
		PW=10ms sinusoidal, $T_j=150^\circ\text{C}$	17	A
		PW=10μs square, $T_j=25^\circ\text{C}$	80	A
Repetitive peak forward current	$I_{FRM}$	27 *1	A	
$i^2t$ value	$\int i^2 dt$	PW=10ms, $T_j=25^\circ\text{C}$	2.5	$\text{A}^2\text{s}$
		PW=10ms, $T_j=150^\circ\text{C}$	1.4	$\text{A}^2\text{s}$
Total power dissipation	$P_D$	88 *2	W	
Junction temperature	$T_j$	175	$^\circ\text{C}$	
Range of storage temperature	$T_{stg}$	-55 to +175	$^\circ\text{C}$	

\*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** ( $T_j = 25^\circ\text{C}$ )

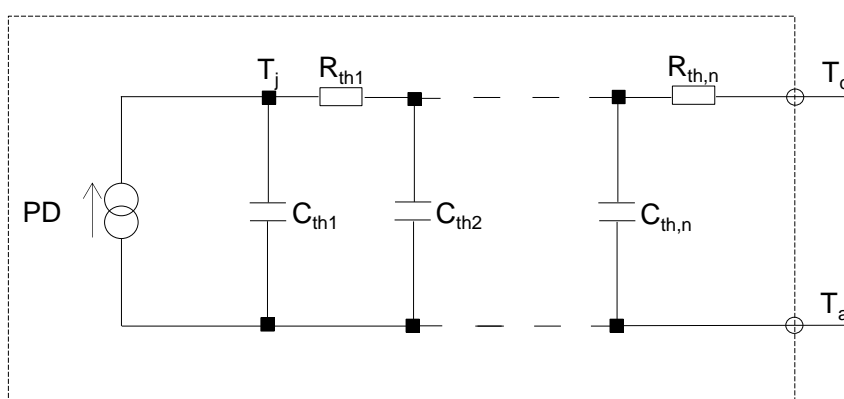
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{DC}$	$I_R = 0.1\text{mA}$	1200	-	-	V
Forward voltage	$V_F$	$I_F = 5\text{A}, T_j = 25^\circ\text{C}$	-	1.4	1.6	V
		$I_F = 5\text{A}, T_j = 150^\circ\text{C}$	-	1.8	-	V
		$I_F = 5\text{A}, T_j = 175^\circ\text{C}$	-	1.9	-	V
Reverse current	$I_R$	$V_R = 1200\text{V}, T_j = 25^\circ\text{C}$	-	5	100	$\mu\text{A}$
		$V_R = 1200\text{V}, T_j = 150^\circ\text{C}$	-	40	-	$\mu\text{A}$
		$V_R = 1200\text{V}, T_j = 175^\circ\text{C}$	-	65	-	$\mu\text{A}$
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$	-	260	-	pF
		$V_R = 800\text{V}, f = 1\text{MHz}$	-	21	-	pF
Total capacitive charge	$Q_C$	$V_R = 800\text{V}, di/dt = 500\text{A}/\mu\text{s}$	-	17	-	nC
Switching time	$t_C$	$V_R = 800\text{V}, di/dt = 500\text{A}/\mu\text{s}$	-	15	-	ns

**●Thermal characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	-	-	1.5	1.7	$^\circ\text{C}/\text{W}$

**●Typical Transient Thermal Characteristics**

Symbol	Value	Unit	Symbol	Value	Unit
$R_{th1}$	$3.06 \times 10^{-1}$	K/W	$C_{th1}$	$2.49 \times 10^{-3}$	Ws/K
$R_{th2}$	$9.33 \times 10^{-1}$		$C_{th2}$	$4.92 \times 10^{-3}$	
$R_{th3}$	$2.62 \times 10^{-1}$		$C_{th3}$	$9.57 \times 10^{-2}$	



●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

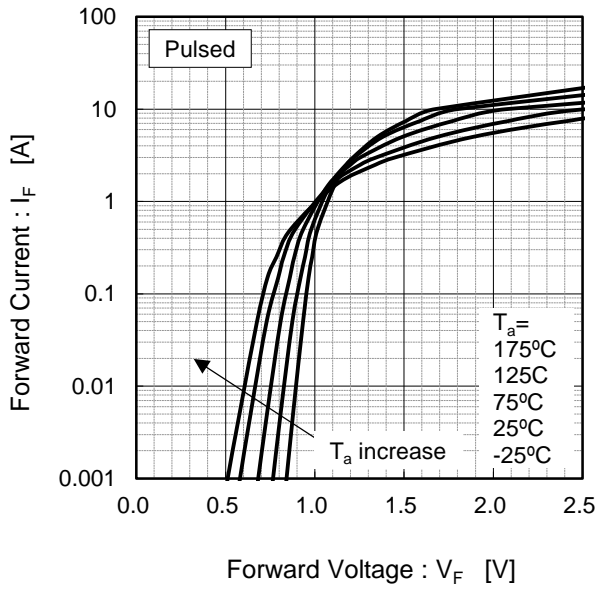


Fig.2  $V_F - I_F$  Characteristics

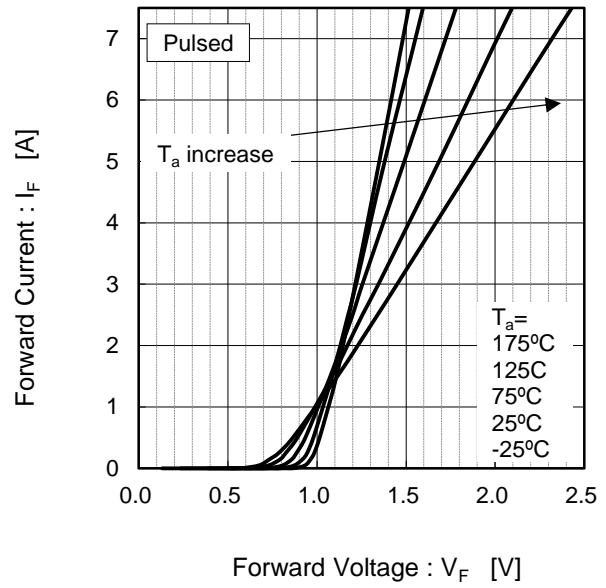


Fig.3  $V_R - I_R$  Characteristics

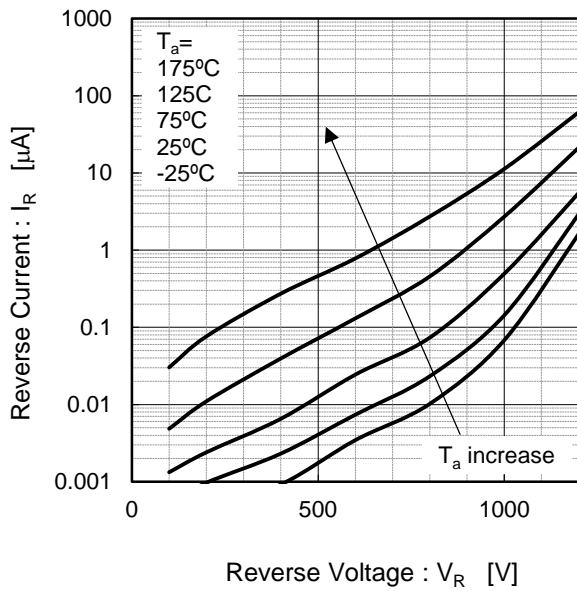
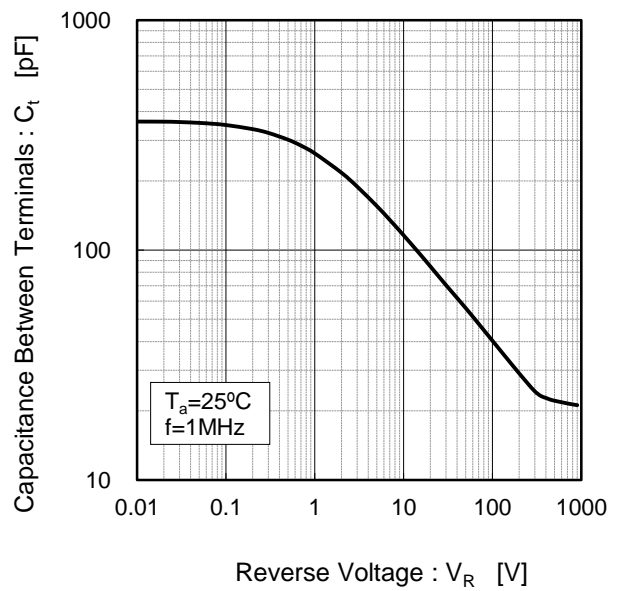


Fig.4  $V_R - C_t$  Characteristics



● Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

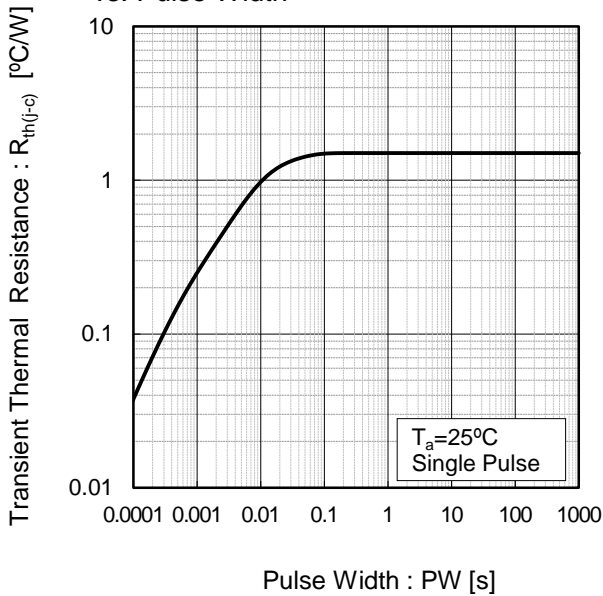


Fig.6 Power Dissipation

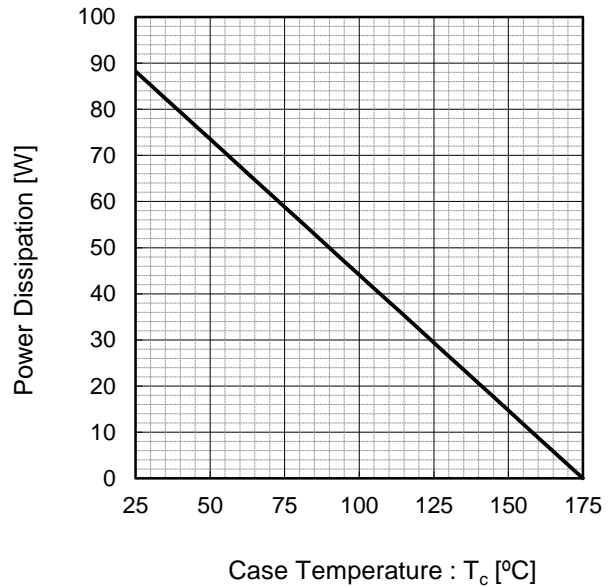
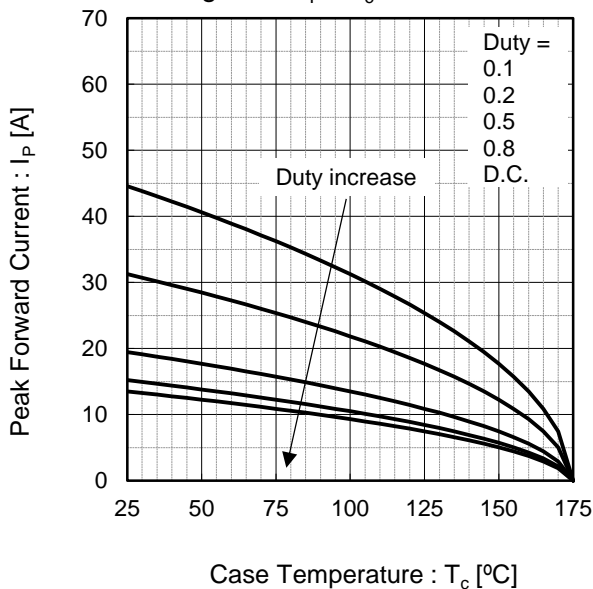
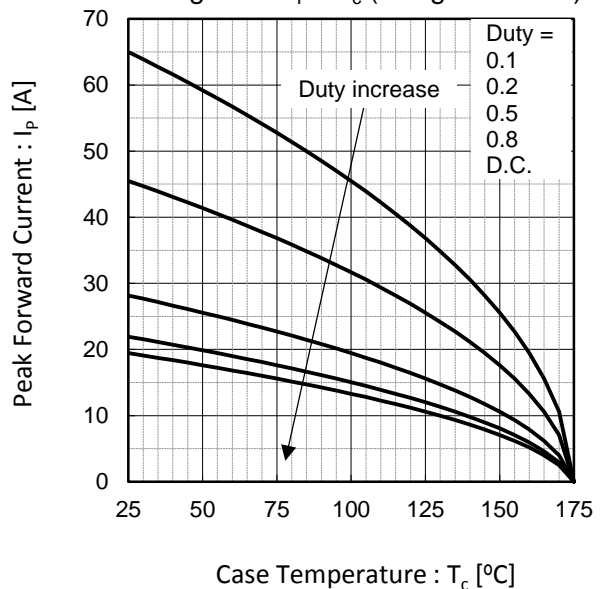


Fig.7\*3 Maximum peak forward current derating curve  $I_P - T_C$



\*3 Based on max Vf, 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 Vf, 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)

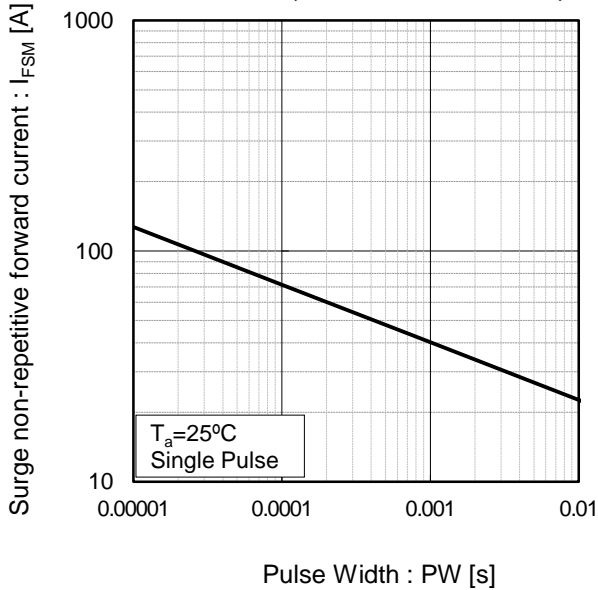
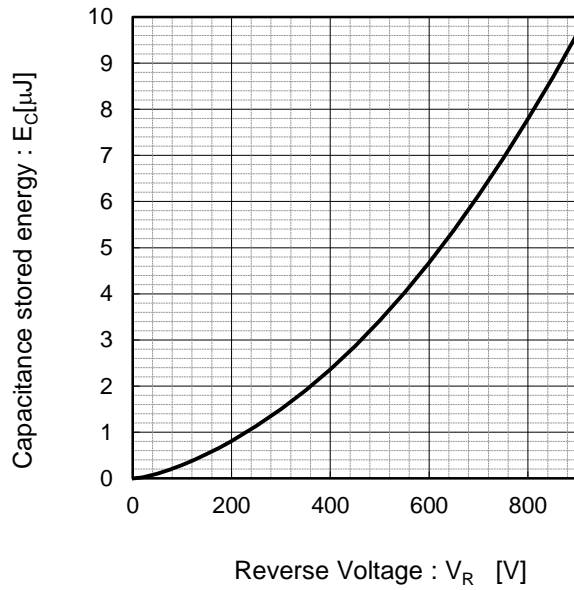
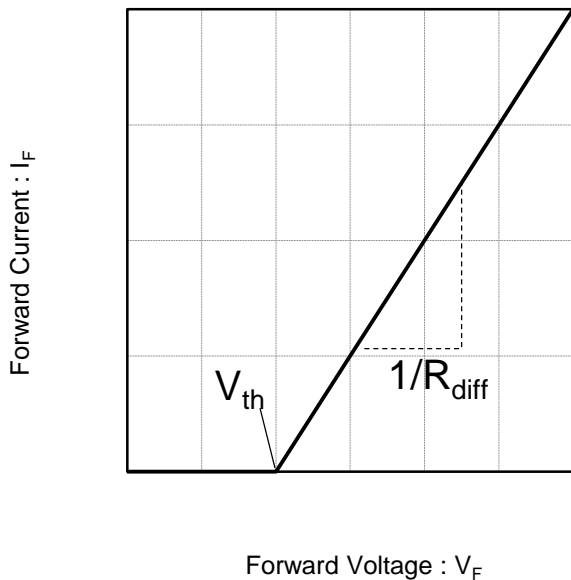


Fig.10 Typical capacitance store energy



●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
$a_0$	$9.93 \times 10^{-1}$	V
$a_1$	$-1.27 \times 10^{-3}$	V/°C
$b_0$	$7.30 \times 10^{-2}$	$\Omega$
$b_1$	$4.12 \times 10^{-4}$	$\Omega/^\circ\text{C}$
$b_2$	$2.66 \times 10^{-6}$	$\Omega/^\circ\text{C}^2$

$T_j$  in °C;  $-55^\circ\text{C} < T_j < ^\circ\text{C}$ ;  $I_F < 10 \text{ A}$

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