

$V_R$	650V
$I_F$	6A
$Q_C$	9nC

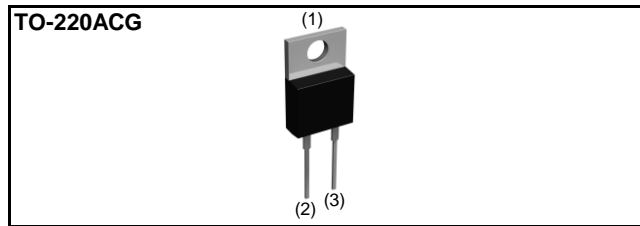
### ●Features

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

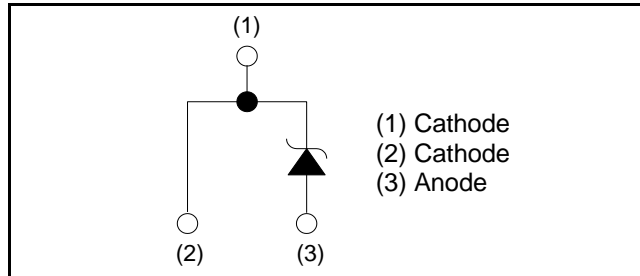
### ●Applications

- 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	SCS206AG

### ●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 ( $T_c = 138^\circ\text{C}$ )	$I_F$	6	A	
Surge non-repetitive forward current	$I_{FSM}$	PW=10ms sinusoidal, $T_j=25^\circ\text{C}$	23	A
		PW=10ms sinusoidal, $T_j=150^\circ\text{C}$	18	A
		PW=10μs square, $T_j=25^\circ\text{C}$	90	A
Repetitive peak forward current	$I_{FRM}$	27 *1	A	
$i^2t$ value	$\int i^2 dt$	PW=10ms, $T_j=25^\circ\text{C}$	2.6	$\text{A}^2\text{s}$
		PW=10ms, $T_j=150^\circ\text{C}$	1.6	$\text{A}^2\text{s}$
Total power dissipation	$P_D$	51 *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** ( $T_j = 25^\circ\text{C}$ )

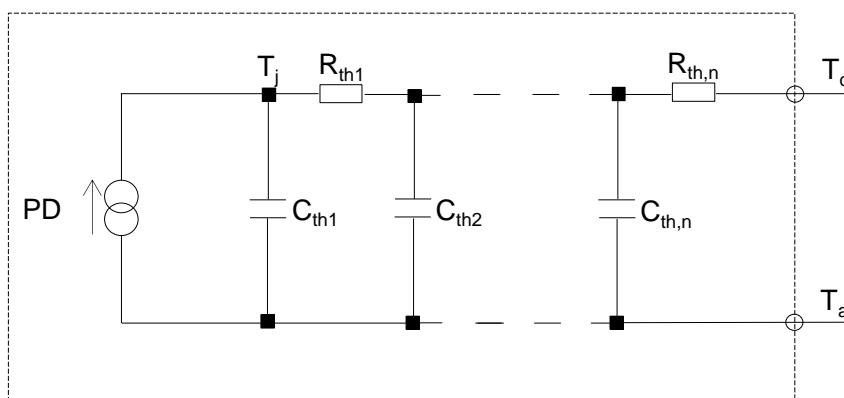
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{DC}$	$I_R = 1.2\text{mA}$	650	-	-	V
Forward voltage	$V_F$	$I_F = 6\text{A}, T_j = 25^\circ\text{C}$	-	1.35	1.55	V
		$I_F = 6\text{A}, T_j = 150^\circ\text{C}$	-	1.55	-	V
		$I_F = 6\text{A}, T_j = 175^\circ\text{C}$	-	1.63	-	V
Reverse current	$I_R$	$V_R = 600\text{V}, T_j = 25^\circ\text{C}$	-	1.2	120	$\mu\text{A}$
		$V_R = 600\text{V}, T_j = 150^\circ\text{C}$	-	18	-	$\mu\text{A}$
		$V_R = 600\text{V}, T_j = 175^\circ\text{C}$	-	42	-	$\mu\text{A}$
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$	-	220	-	pF
		$V_R = 600\text{V}, f = 1\text{MHz}$	-	22	-	pF
Total capacitive charge	$Q_C$	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	9	-	nC
Switching time	$t_C$	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	12	-	ns

**●Thermal characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	-	-	2.6	2.9	$^\circ\text{C}/\text{W}$

**●Typical Transient Thermal Characteristics**

Symbol	Value	Unit	Symbol	Value	Unit
$R_{th1}$	$1.00 \times 10^0$	K/W	$C_{th1}$	$1.13 \times 10^{-3}$	Ws/K
$R_{th2}$	$1.28 \times 10^0$		$C_{th2}$	$3.44 \times 10^{-3}$	
$R_{th3}$	$2.70 \times 10^{-1}$		$C_{th3}$	$3.11 \times 10^{-1}$	



●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

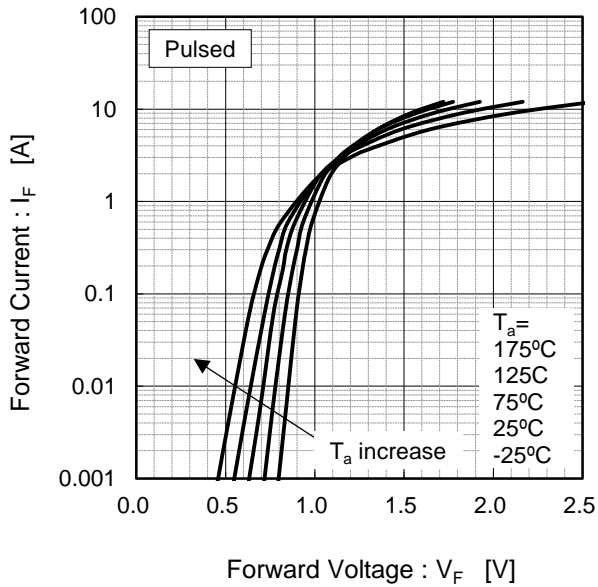


Fig.2  $V_F - I_F$  Characteristics

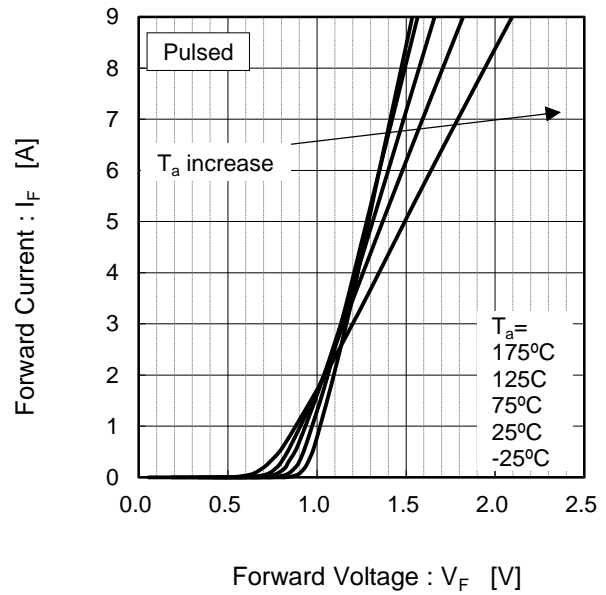


Fig.3  $V_R - I_R$  Characteristics

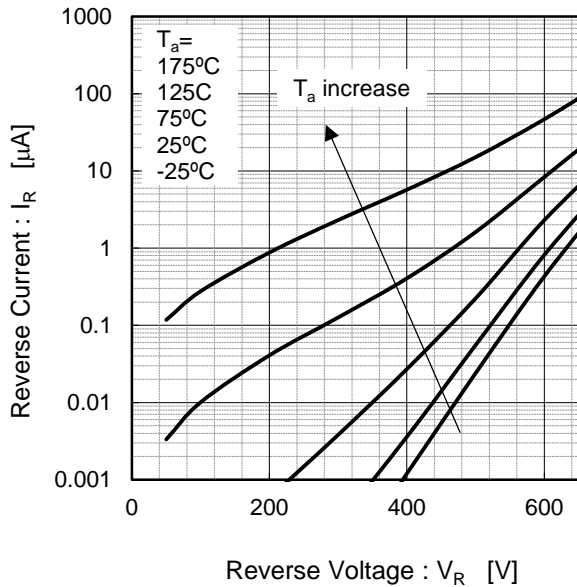
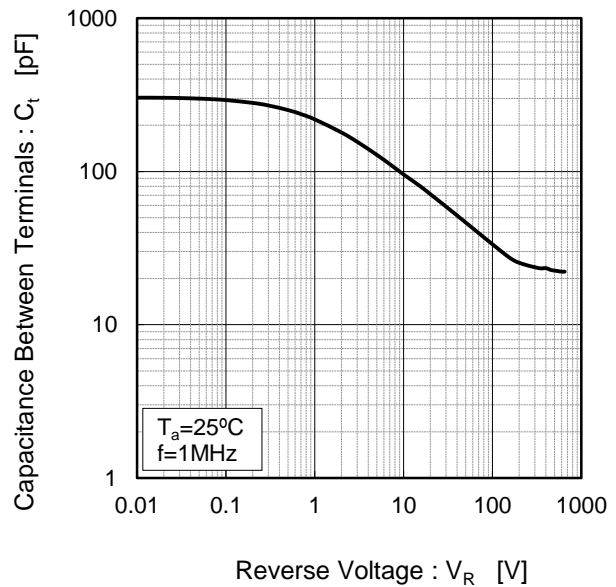


Fig.4  $V_R - C_t$  Characteristics



● Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

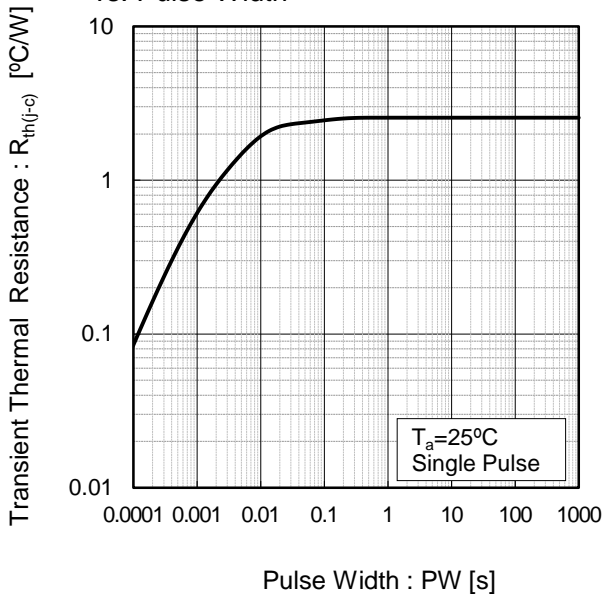


Fig.6 Power Dissipation

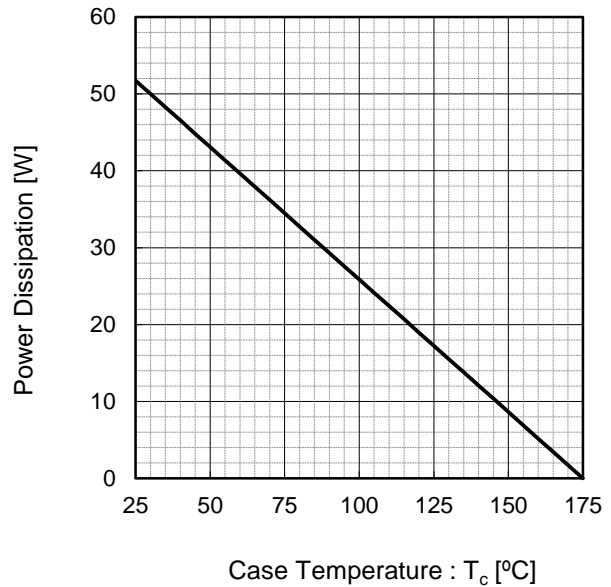
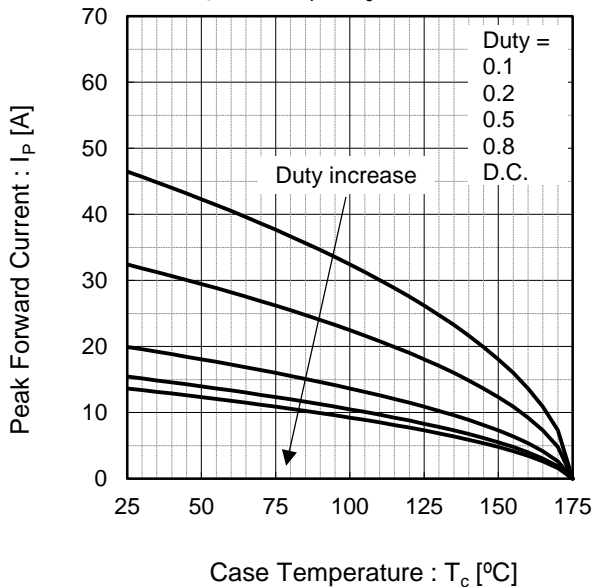
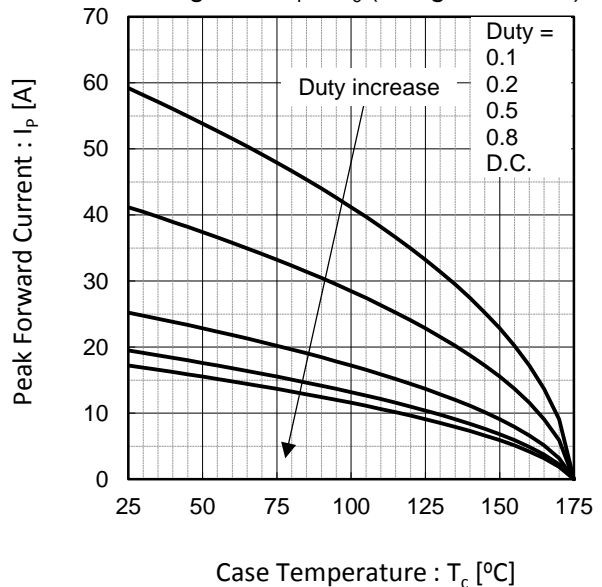


Fig.7\*3 Maximum peak forward current derating curve  $I_P - T_c$



\*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)

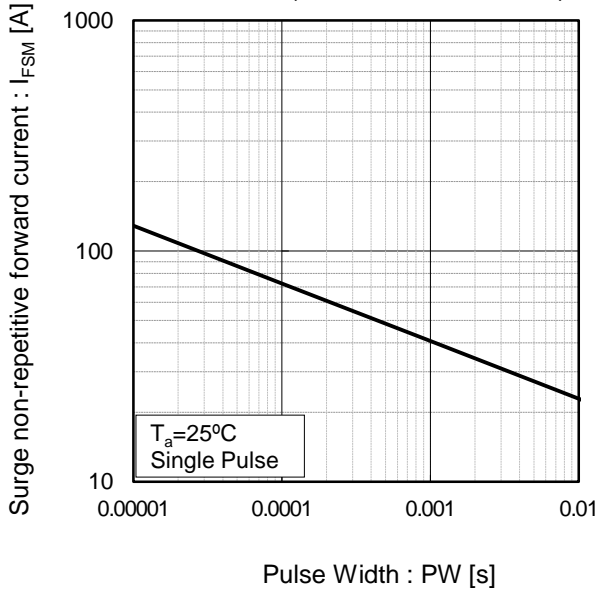
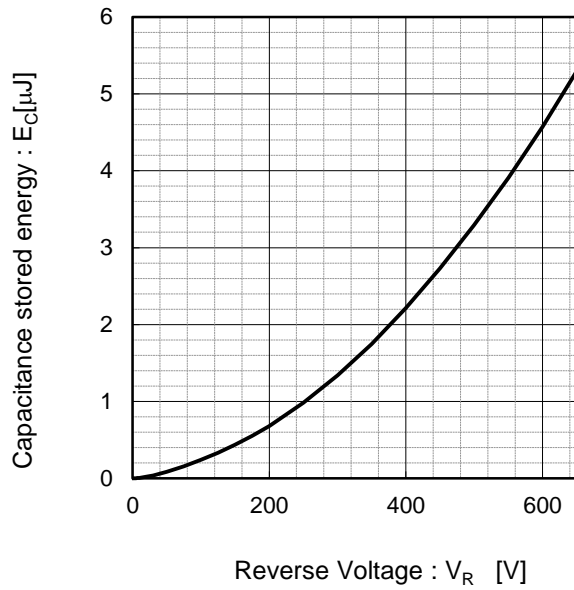
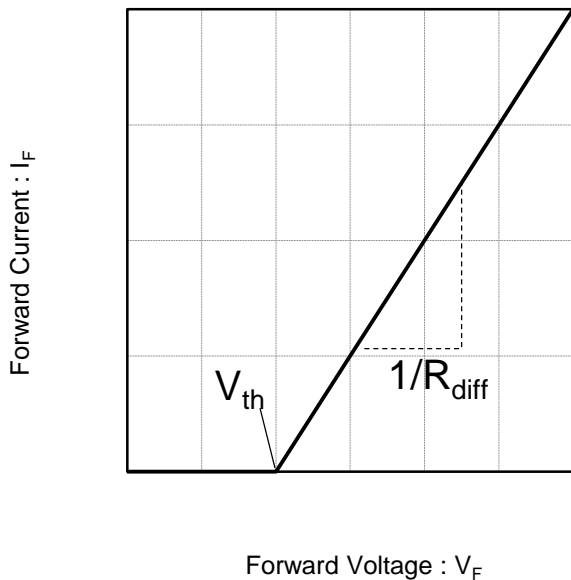


Fig.10 Typical capacitance store energy



●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
$a_0$	$9.35 \times 10^{-1}$	V
$a_1$	$-1.12 \times 10^{-3}$	V/°C
$b_0$	$6.63 \times 10^{-2}$	Ω
$b_1$	$1.70 \times 10^{-4}$	Ω/°C
$b_2$	$1.80 \times 10^{-6}$	Ω/°C <sup>2</sup>

$T_j$  in °C;  $-55\text{ °C} < T_j < \text{°C}$ ;  $I_F < 12\text{ A}$

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