

$V_R$	650V
$I_F$	20A
$Q_C$	31nC

### ●Features

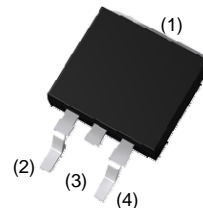
- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible

### ●Applications

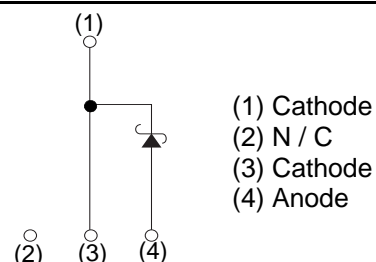
- PFC Boost Topology
- Secondary Side Rectification
- Data Center
- PV Power Conditioners

### ●Outline

LPT(L)  
<TO-263AB>



### ●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	SCS220AJ

### ●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 ( $T_c = 116^\circ\text{C}$ )		$I_F$	20	A
Surge non-repetitive forward current	PW=10ms sinusoidal, $T_j=25^\circ\text{C}$	$I_{FSM}$	68	A
	PW=10ms sinusoidal, $T_j=150^\circ\text{C}$		53	A
	PW=10μs square, $T_j=25^\circ\text{C}$		260	A
Repetitive peak forward current		$I_{FRM}$	71 <sup>*1</sup>	A
$i^2t$ value	PW=10ms, $T_j=25^\circ\text{C}$	$\int i^2 dt$	23	A <sup>2</sup> s
	PW=10ms, $T_j=150^\circ\text{C}$		14	A <sup>2</sup> s
Total power dissipation		$P_D$	100 <sup>*2</sup>	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** ( $T_j = 25^\circ\text{C}$ )

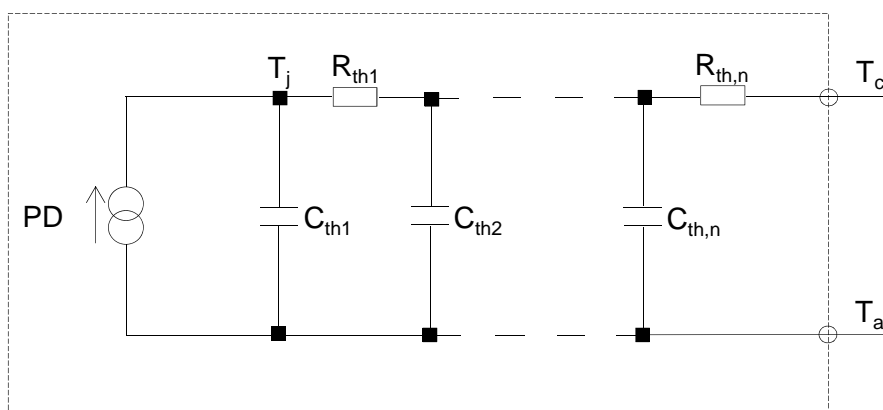
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{\text{DC}}$	$I_{\text{R}}=4.0\text{mA}$	650	-	-	V
Forward voltage	$V_{\text{F}}$	$I_{\text{F}}=20\text{A}, T_j=25^\circ\text{C}$	-	1.35	1.55	V
		$I_{\text{F}}=20\text{A}, T_j=150^\circ\text{C}$	-	1.55	-	V
		$I_{\text{F}}=20\text{A}, T_j=175^\circ\text{C}$	-	1.63	-	V
Reverse current	$I_{\text{R}}$	$V_{\text{R}}=600\text{V}, T_j=25^\circ\text{C}$	-	4	400	$\mu\text{A}$
		$V_{\text{R}}=600\text{V}, T_j=150^\circ\text{C}$	-	60	-	$\mu\text{A}$
		$V_{\text{R}}=600\text{V}, T_j=175^\circ\text{C}$	-	140	-	$\mu\text{A}$
Total capacitance	$C$	$V_{\text{R}}=1\text{V}, f=1\text{MHz}$	-	730	-	pF
		$V_{\text{R}}=600\text{V}, f=1\text{MHz}$	-	74	-	pF
Total capacitive charge	$Q_{\text{C}}$	$V_{\text{R}}=400\text{V}, di/dt=350\text{A}/\mu\text{s}$	-	31	-	nC
Switching time	$t_{\text{C}}$	$V_{\text{R}}=400\text{V}, di/dt=350\text{A}/\mu\text{s}$	-	19	-	ns

**●Thermal characteristics**

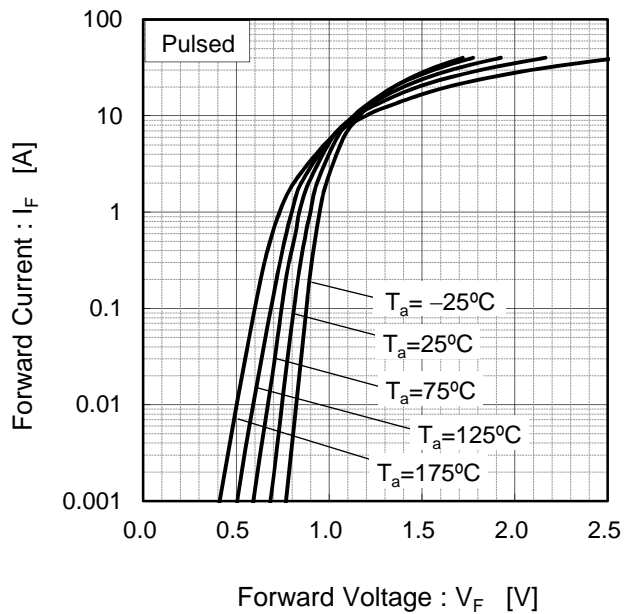
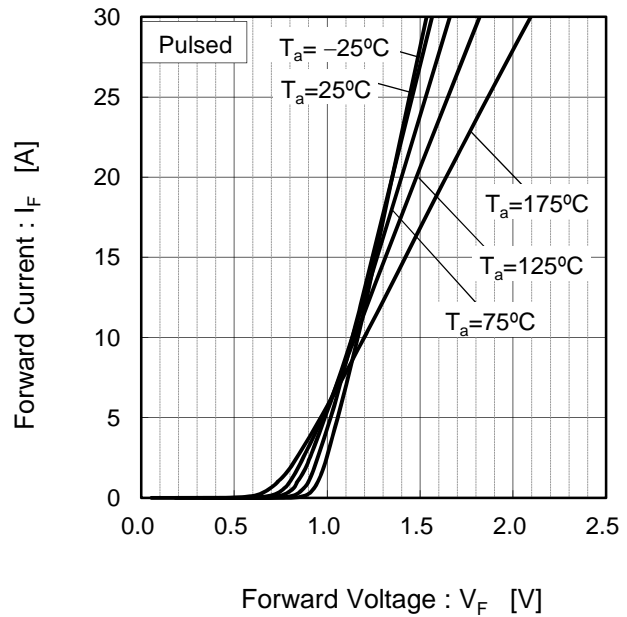
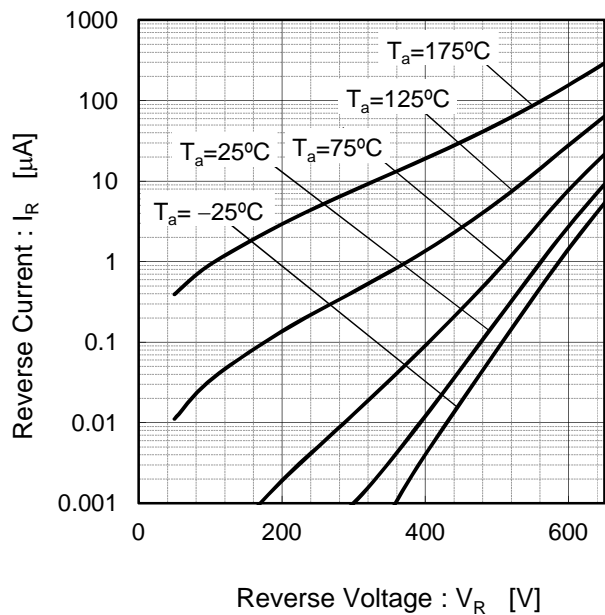
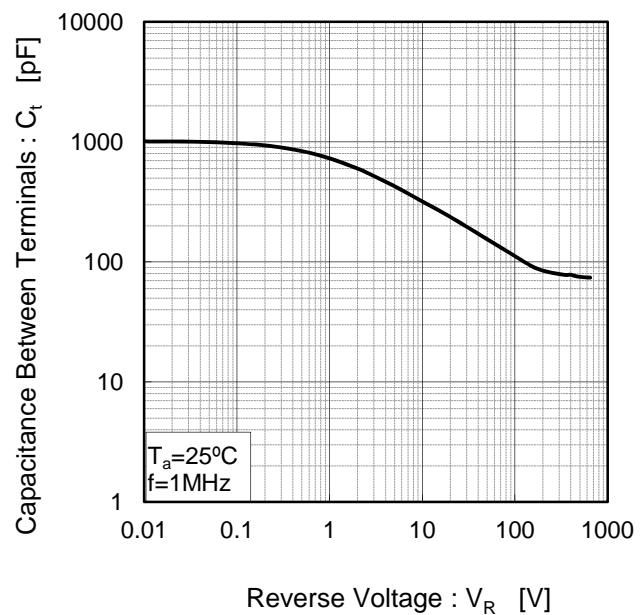
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{\text{th(j-c)}}$	-	-	1.1	1.4	$^\circ\text{C}/\text{W}$

**●Typical Transient Thermal Characteristics**

Symbol	Value	Unit	Symbol	Value	Unit
$R_{\text{th1}}$	2.43E-02	K/W	$C_{\text{th1}}$	3.11E-03	Ws/K
$R_{\text{th2}}$	7.53E-01		$C_{\text{th2}}$	1.03E-03	
$R_{\text{th3}}$	3.23E-01		$C_{\text{th3}}$	1.55E-01	



# ●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

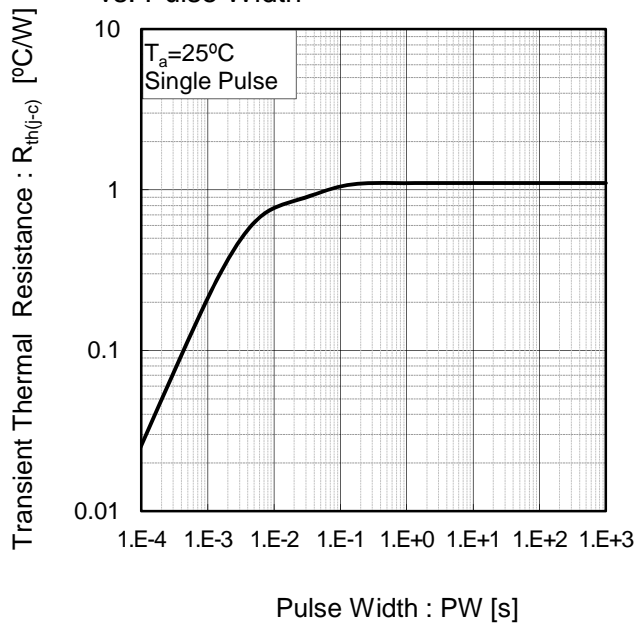


Fig.6 Power Dissipation

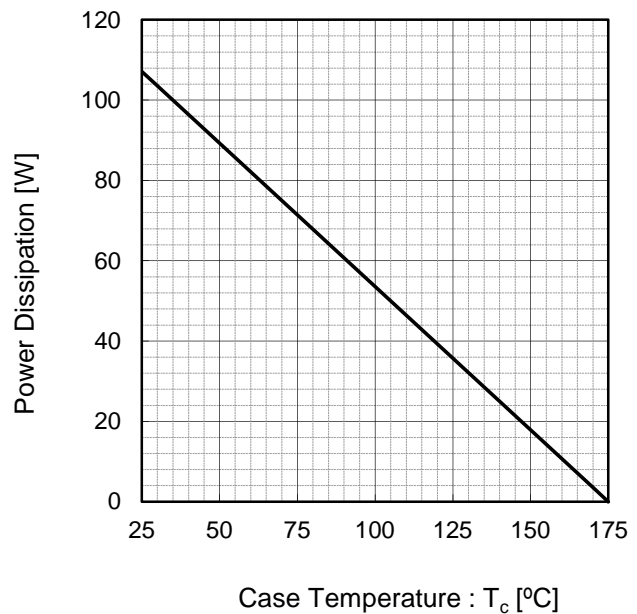
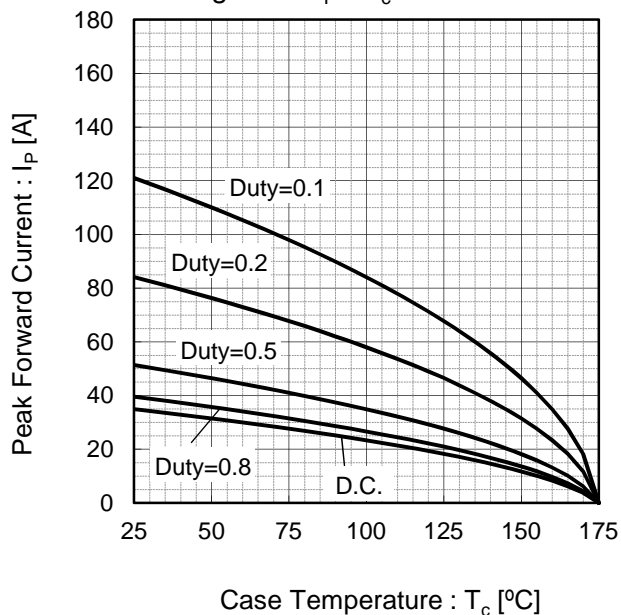
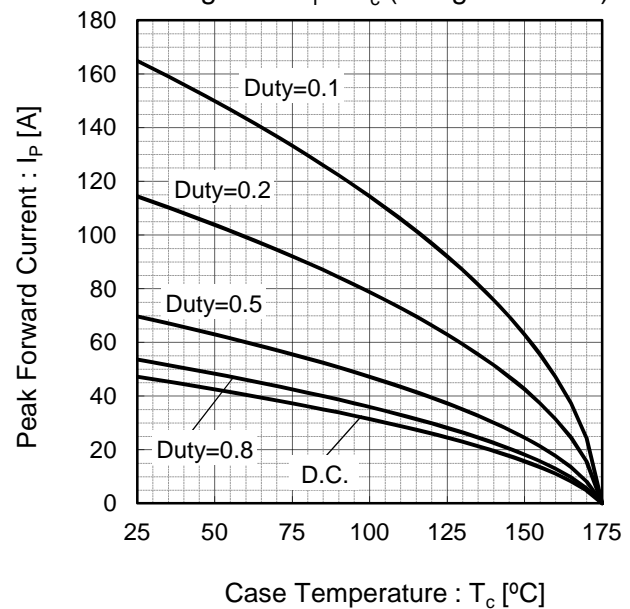


Fig.7\*3 Maximum peak forward current derating curve  $I_P - T_c$



\*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)

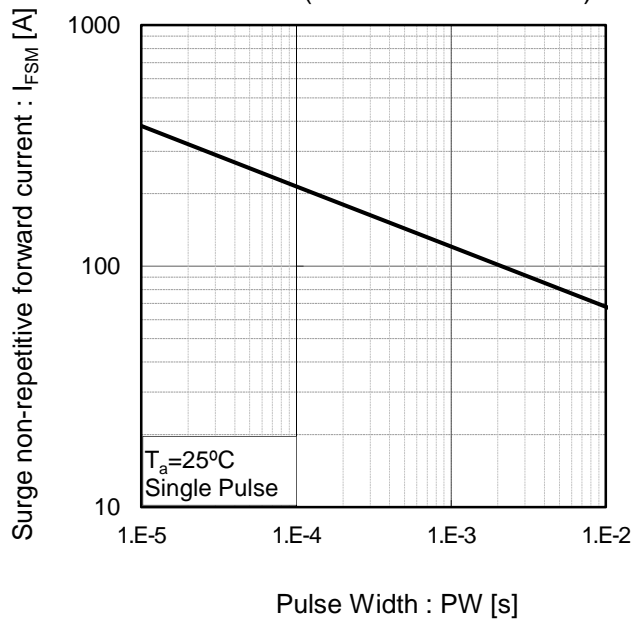
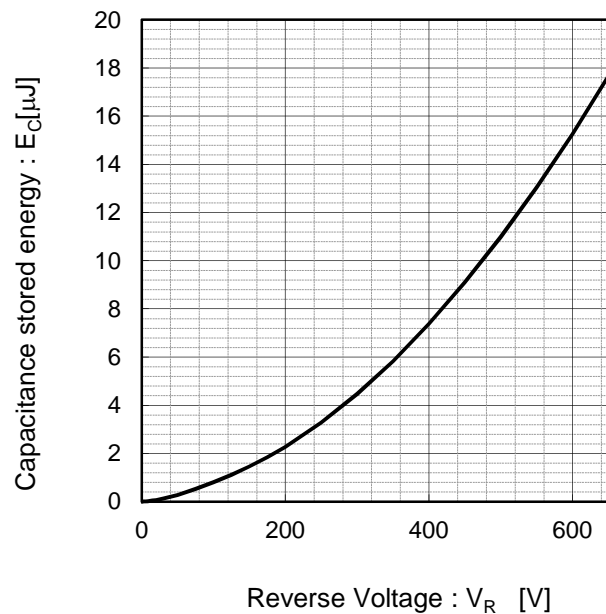
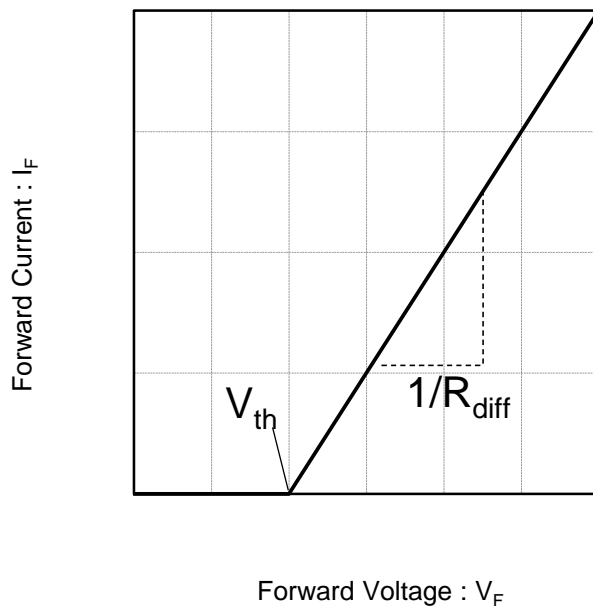


Fig.10 Typical capacitance store energy



## ●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
$b_0$	1.99E-02	Ω
$b_1$	5.10E-05	Ω/°C
$b_2$	5.40E-07	Ω/°C <sup>2</sup>

$T_j$  in °C;  $-55^\circ\text{C} < T_j < 150^\circ\text{C}$ ;  $I_F < 40\text{ A}$

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## SCS220AJ - Web Page

[Distribution Inventory](#)

Part Number	SCS220AJ
Package	TO-263AB (LPTL)
Unit Quantity	1000
Minimum Package Quantity	1000
Packing Type	Taping
Constitution Materials List	inquiry
RoHS	Yes