

$V_R$	650V
$I_F$	15A
$Q_C$	37nC

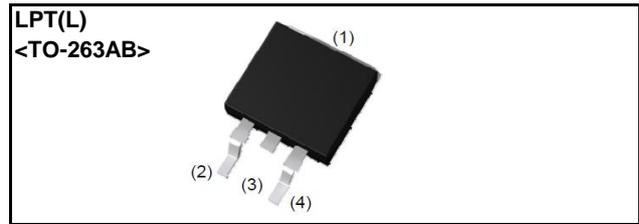
### ●Features

- 1) Low forward voltage
- 2) Negligible recovery time/current
- 3) Temperature independent switching behavior
- 4) High surge current capability
- 5) Low leakage current

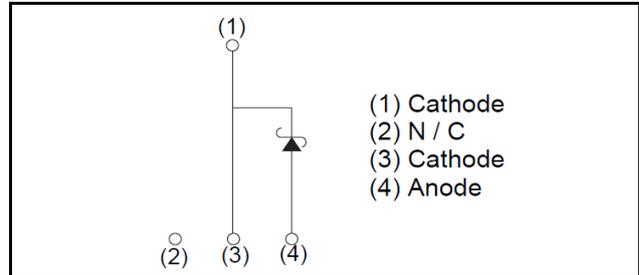
### ●Applications

- Switch Mode Power Supply
- Uninterruptible Power Supply
- Solar Inverter
- Motor Drive
- Air Conditioner
- 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	SCS315AJ

### ●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 ( $T_c = 130^\circ\text{C}$ )	$I_F$	15	A	
Surge non-repetitive forward current	$I_{FSM}$	PW=10ms sinusoidal, $T_j=25^\circ\text{C}$	112	A
		PW=10ms sinusoidal, $T_j=150^\circ\text{C}$	95	A
		PW=10 $\mu\text{s}$ square, $T_j=25^\circ\text{C}$	410	A
Repetitive peak forward current	$I_{FRM}$	66 <sup>*1</sup>	A	
$i^2t$ value	$\int i^2 dt$	$1 \leq PW \leq 10\text{ms}$ , $T_j=25^\circ\text{C}$	62	$\text{A}^2\text{s}$
		$1 \leq PW \leq 10\text{ms}$ , $T_j=150^\circ\text{C}$	45	$\text{A}^2\text{s}$
Total power dissipation	$P_D$	100 <sup>*2</sup>	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<sub>j</sub> = 25°C)**

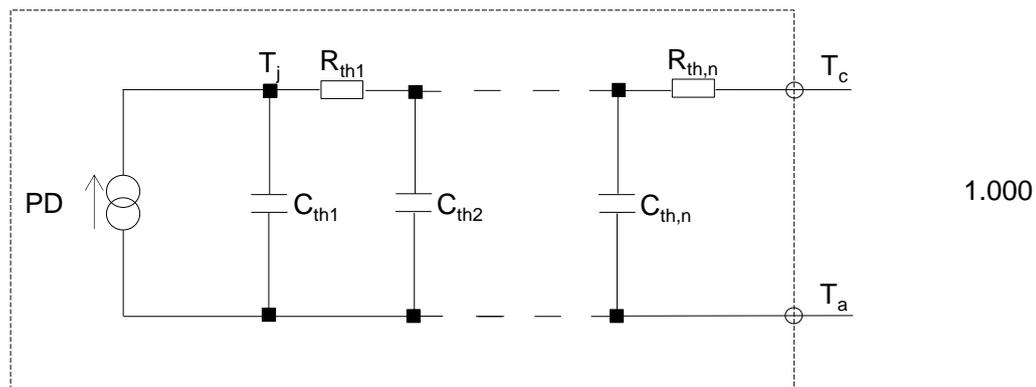
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V <sub>DC</sub>	I <sub>R</sub> =75μA	650	-	-	V
Forward voltage	V <sub>F</sub>	I <sub>F</sub> =15A, T <sub>j</sub> =25°C	-	1.35	1.50	V
		I <sub>F</sub> =15A, T <sub>j</sub> =150°C	-	1.44	1.71	V
		I <sub>F</sub> =15A, T <sub>j</sub> =175°C	-	1.50	-	V
Reverse current	I <sub>R</sub>	V <sub>R</sub> =650V, T <sub>j</sub> =25°C	-	0.045	75	μA
		V <sub>R</sub> =650V, T <sub>j</sub> =150°C	-	3	300	μA
		V <sub>R</sub> =650V, T <sub>j</sub> =175°C	-	9	-	μA
Total capacitance	C	V <sub>R</sub> =1V, f=1MHz	-	750	-	pF
		V <sub>R</sub> =650V, f=1MHz	-	68	-	pF
Total capacitive charge	Q <sub>C</sub>	V <sub>R</sub> =400V, di/dt=350A/μs	-	37	-	nC
Switching time	t <sub>C</sub>	V <sub>R</sub> =400V, di/dt=350A/μs	-	21	-	ns
Non-repetitive Avaranche Energy	E <sub>ava</sub>	L=1mH	-	210	-	mJ

**●Thermal characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	R <sub>th(j-c)</sub>	-	-	1	1.5	°C/W

**●Typical Transient Thermal Characteristics**

Symbol	Value	Unit	Symbol	Value	Unit
R <sub>th1</sub>	1.34E-01	K/W	C <sub>th1</sub>	2.82E-04	Ws/K
R <sub>th2</sub>	8.63E-01		C <sub>th2</sub>	3.73E-03	
R <sub>th3</sub>	1.00E-03		C <sub>th3</sub>	4.35E+00	



●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

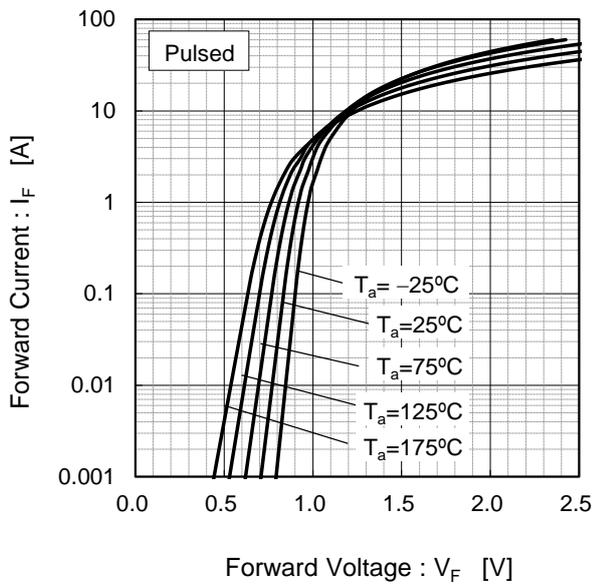


Fig.2  $V_F - I_F$  Characteristics

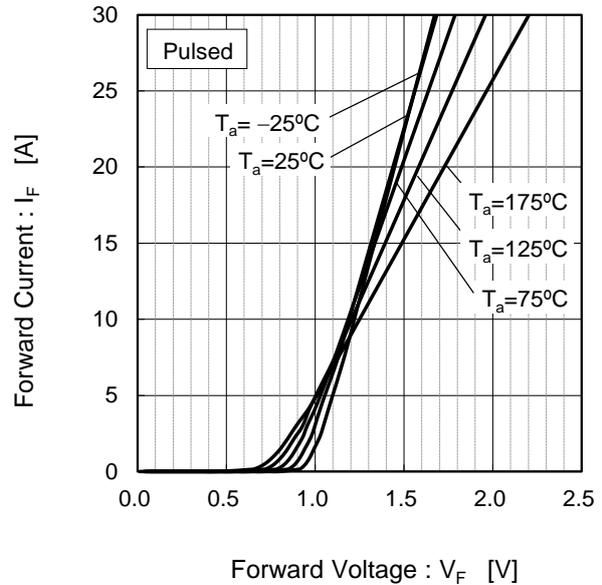


Fig.3  $V_R - I_R$  Characteristics

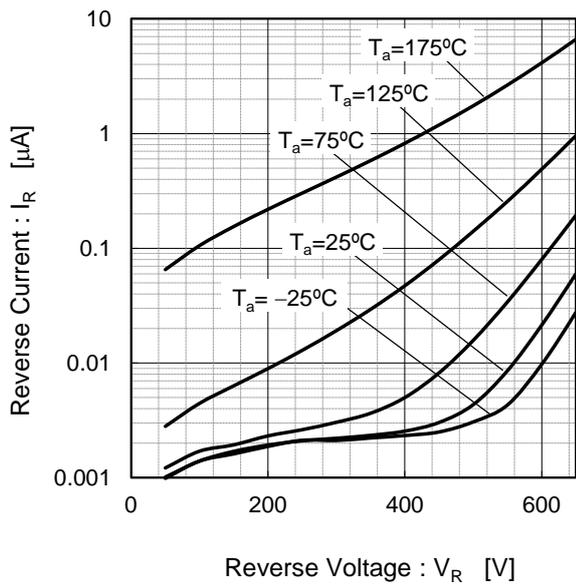
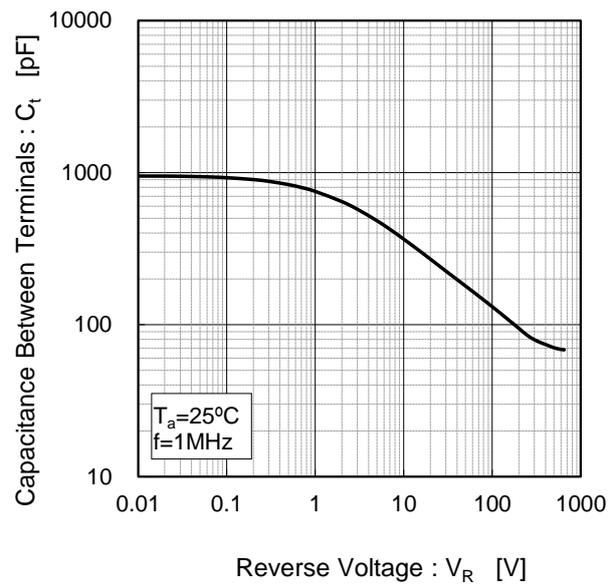


Fig.4  $V_R - C_t$  Characteristics



● Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

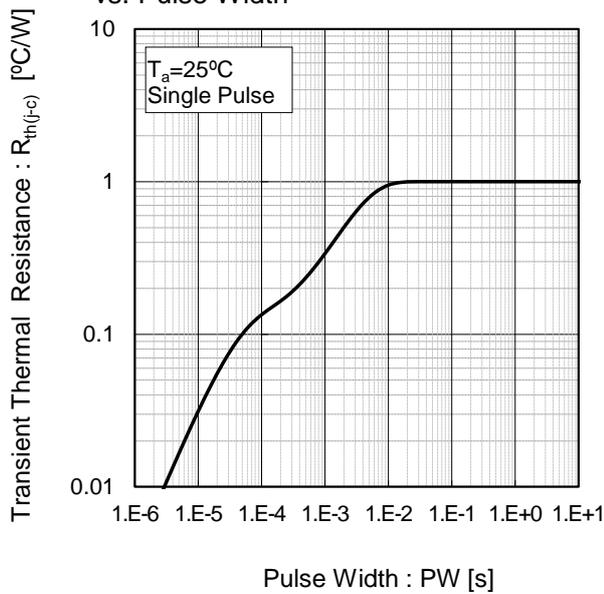


Fig.6 Power Dissipation

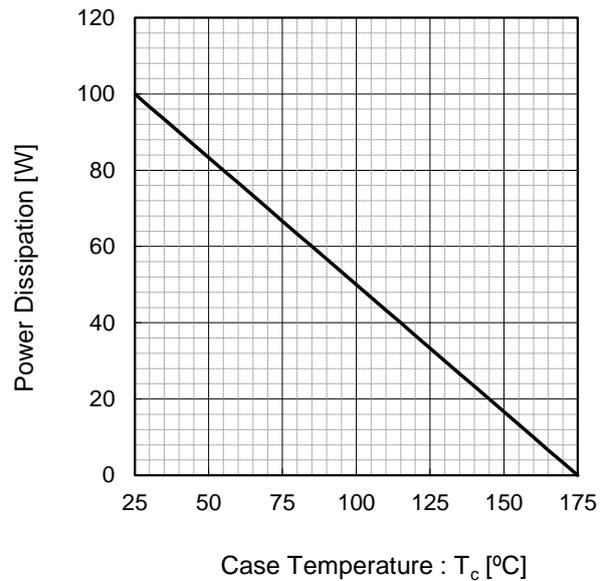
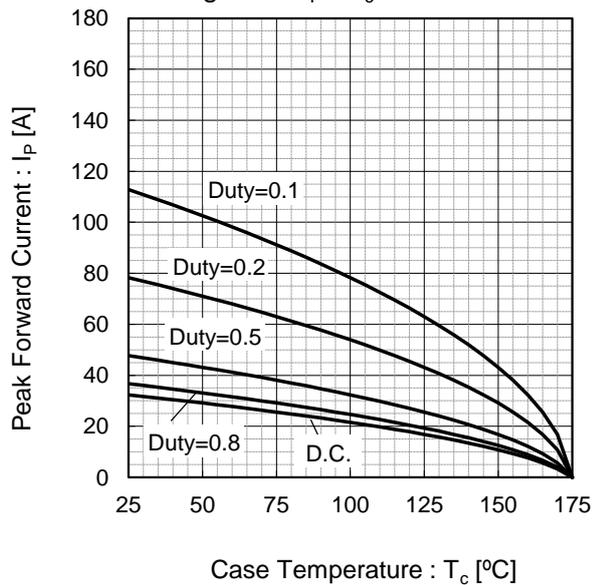
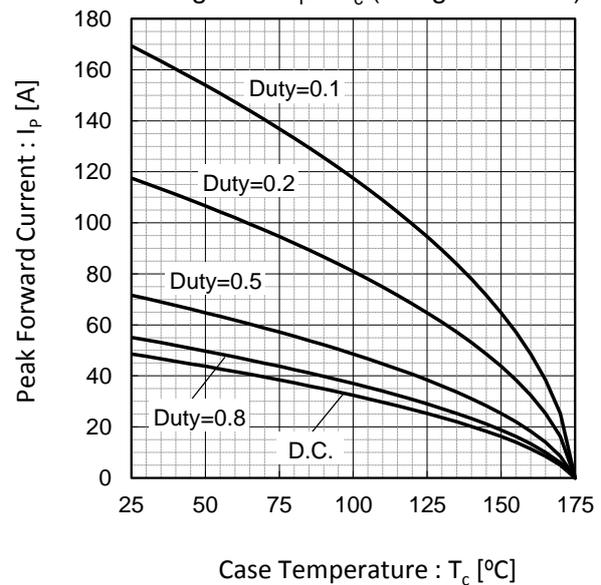


Fig.7\*3 Maximum peak forward current derating curve  $I_p - T_c$



\*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)

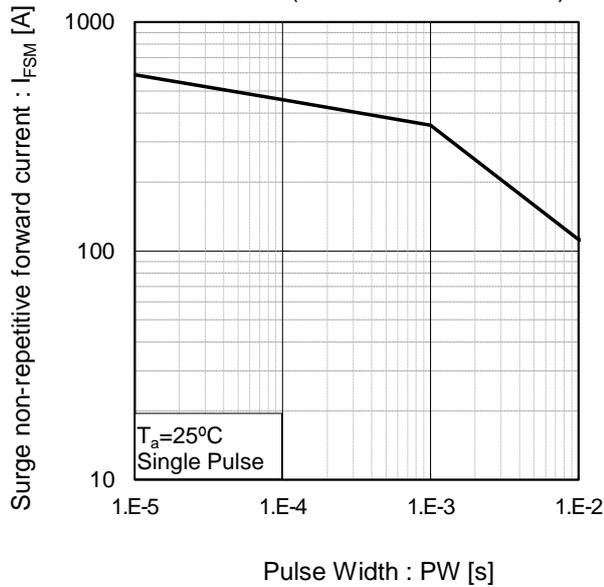
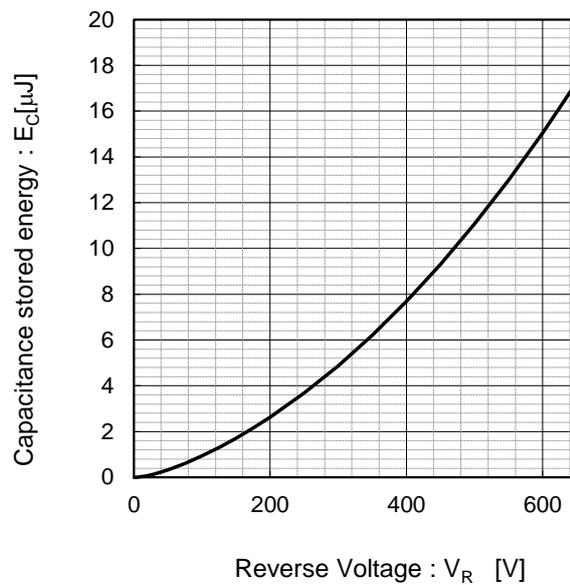
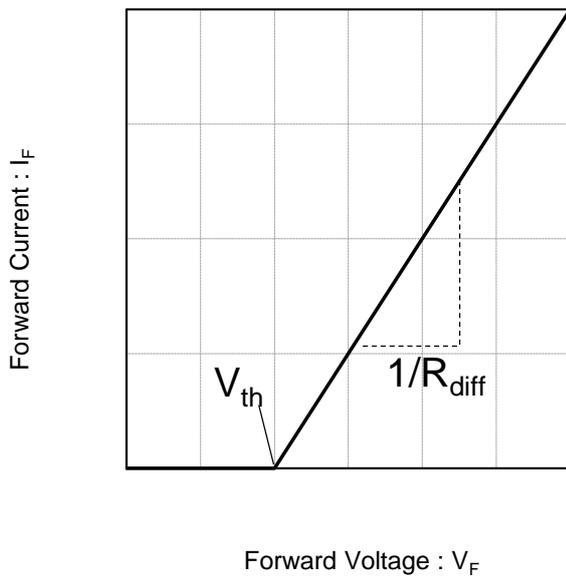


Fig.10 Typical capacitance store energy



●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
$a_0$	9.66E-01	V
$a_1$	-1.10E-03	V/°C
$b_0$	2.35E-02	Ω
$b_1$	4.97E-05	Ω/°C
$b_2$	5.12E-07	Ω/°C <sup>2</sup>

$T_j$  in °C; -55 °C <  $T_j$  < 175°C ;  $I_F$  < 30 A

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Part Number	SCS315AJ
Package	TO-263AB (LPTL)
Unit Quantity	1000
Minimum Package Quantity	1000
Packing Type	Taping
Constitution Materials List	inquiry
RoHS	Yes

# Mouser Electronics

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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.