

$V_R$	650V
$I_F$	8A
$Q_C$	13nC

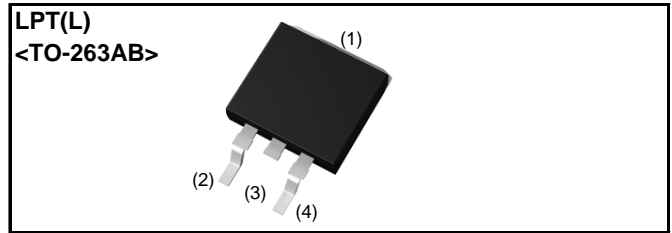
### ●Features

- 1) AEC-Q101 qualified
- 2) Low forward voltage
- 3) Negligible recovery time/current
- 4) Temperature independent switching behavior

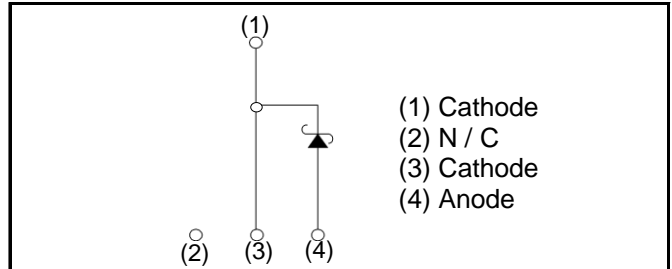
### ●Applications

- On Board Charger
- DC/DC Converter
- Wireless Charger
- 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	SCS208AJ

### ●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 ( $T_c = 135^\circ\text{C}$ )		$I_F$	8	A
Surge non-repetitive forward current	PW=10ms sinusoidal, $T_j=25^\circ\text{C}$	$I_{FSM}$	30	A
	PW=10ms sinusoidal, $T_j=150^\circ\text{C}$		23	A
	PW=10μs square, $T_j=25^\circ\text{C}$		110	A
Repetitive peak forward current		$I_{FRM}$	35 <sup>*1</sup>	A
$i^2t$ value	PW=10ms, $T_j=25^\circ\text{C}$	$\int i^2 dt$	4.3	$\text{A}^2\text{s}$
	PW=10ms, $T_j=150^\circ\text{C}$		2.6	$\text{A}^2\text{s}$
Total power dissipation		$P_D$	62 <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 ( $T_j = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{DC}$	$I_R=1.6\text{mA}$	650	-	-	V
Forward voltage	$V_F$	$I_F=8\text{A}, T_j=25^\circ\text{C}$	-	1.35	1.55	V
		$I_F=8\text{A}, T_j=150^\circ\text{C}$	-	1.55	-	V
		$I_F=8\text{A}, T_j=175^\circ\text{C}$	-	1.63	-	V
Reverse current	$I_R$	$V_R=600\text{V}, T_j=25^\circ\text{C}$	-	1.6	160	$\mu\text{A}$
		$V_R=600\text{V}, T_j=150^\circ\text{C}$	-	24	-	$\mu\text{A}$
		$V_R=600\text{V}, T_j=175^\circ\text{C}$	-	56	-	$\mu\text{A}$
Total capacitance	C	$V_R=1\text{V}, f=1\text{MHz}$	-	290	-	pF
		$V_R=600\text{V}, f=1\text{MHz}$	-	30	-	pF
Total capacitive charge	$Q_C$	$V_R=400\text{V}, di/dt=350\text{A}/\mu\text{s}$	-	13	-	nC
Switching time	$t_C$	$V_R=400\text{V}, di/dt=350\text{A}/\mu\text{s}$	-	13	-	ns

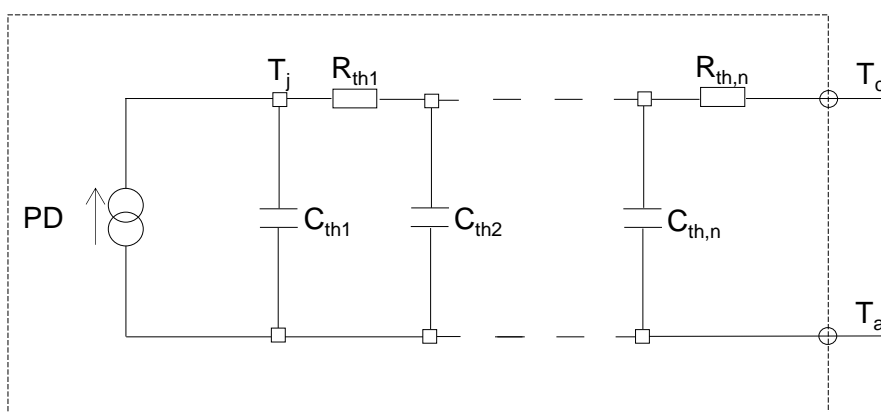
### ●Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	-	-	1.8	2.4	$^\circ\text{C}/\text{W}$

### ●Typical Transient Thermal Characteristics

Symbol	Value	Unit
$R_{th1}$	6.93E-02	K/W
$R_{th2}$	1.12E+00	
$R_{th3}$	6.09E-01	

Symbol	Value	Unit
$C_{th1}$	1.30E-03	Ws/K
$C_{th2}$	5.48E-04	
$C_{th3}$	3.16E-02	



●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

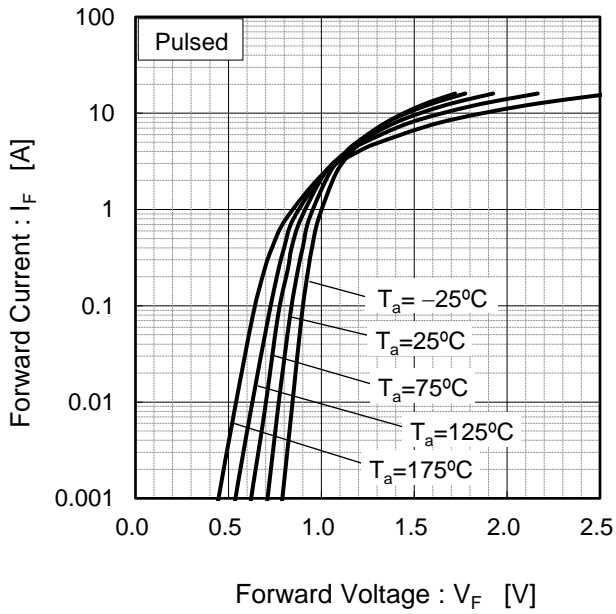


Fig.2  $V_F - I_F$  Characteristics

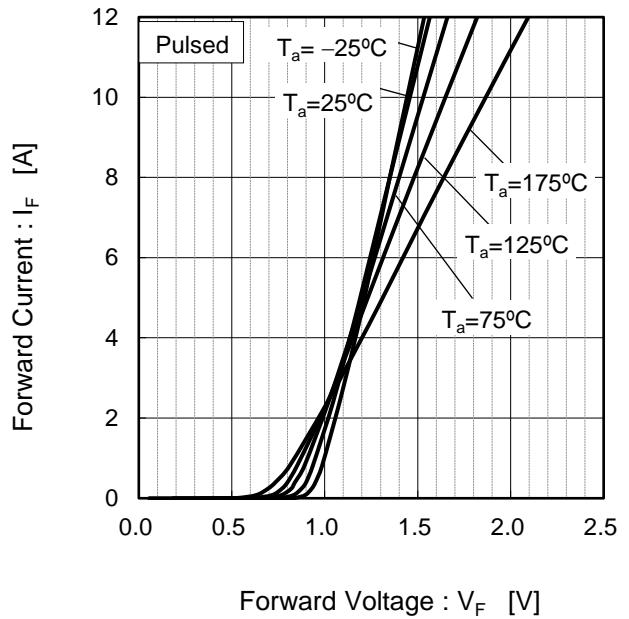


Fig.3  $V_R - I_R$  Characteristics

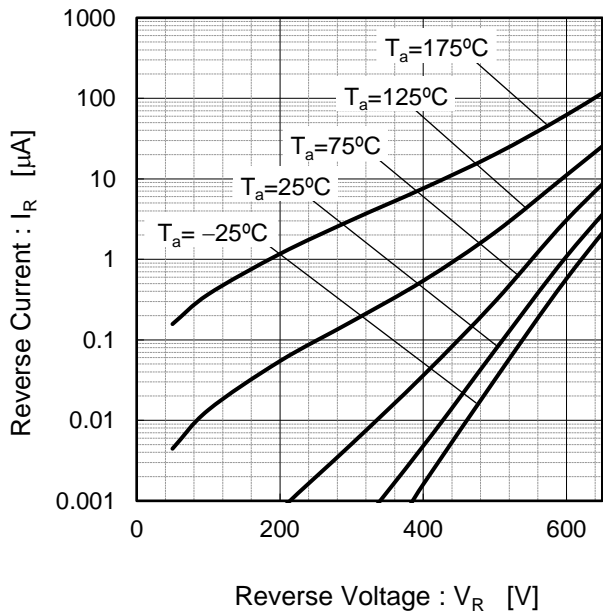
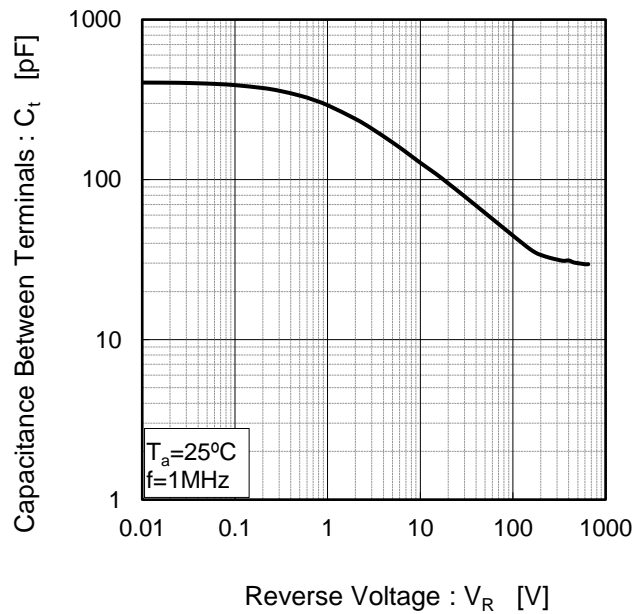


Fig.4  $V_R - C_t$  Characteristics



●Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

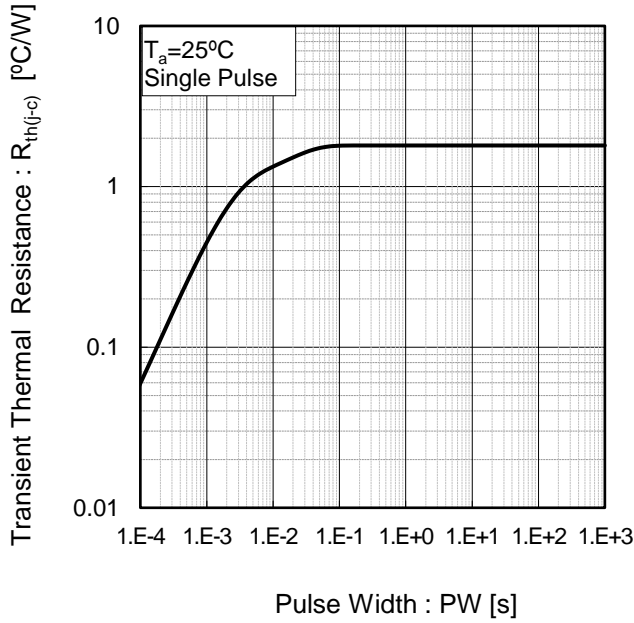


Fig.6 Power Dissipation

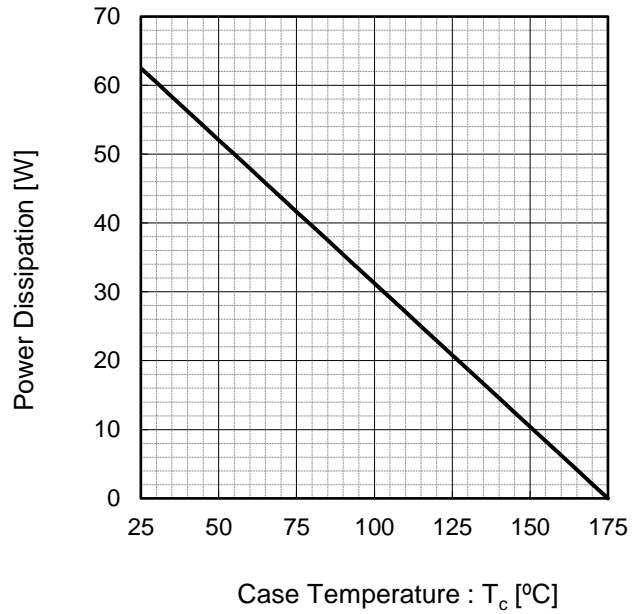
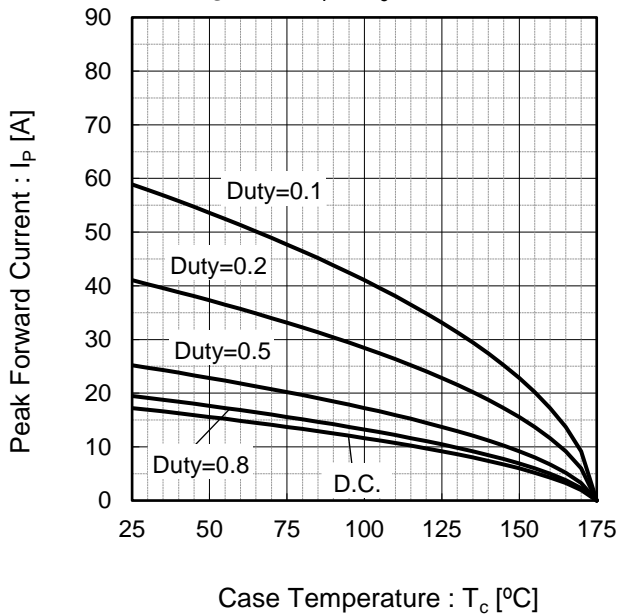
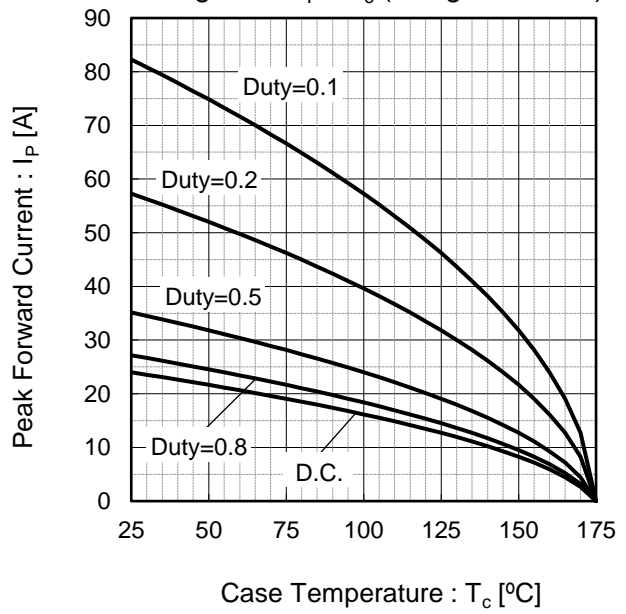


Fig.7\*3 Maximum peak forward current derating curve  $I_P - T_c$



Case Temperature :  $T_c$  [°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)



Case Temperature :  $T_c$  [°C]  
 \*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)

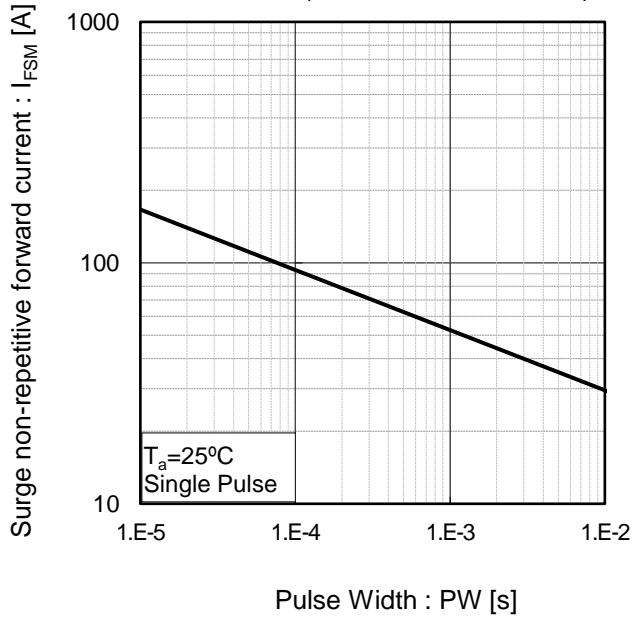
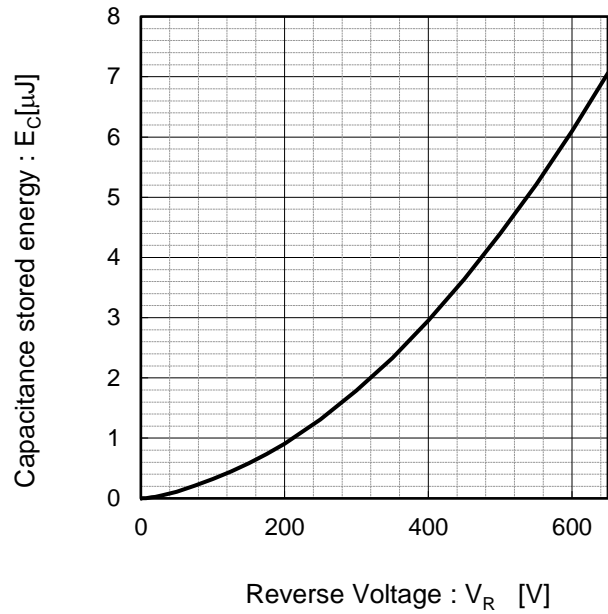
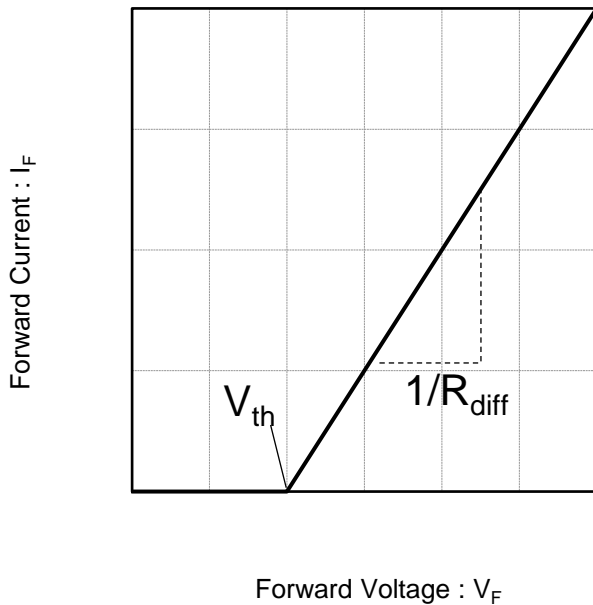


Fig.10 Typical capacitance store energy



●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
$a_0$	9.35E-01	V
$a_1$	-1.12E-03	V/°C
$b_0$	4.98E-02	$\Omega$
$b_1$	1.28E-04	$\Omega/^\circ\text{C}$
$b_2$	1.35E-06	$\Omega/^\circ\text{C}^2$

$T_j$  in °C;  $-55\text{ }^\circ\text{C} < T_j < \text{ }^\circ\text{C}$ ;  $I_F < 16\text{ A}$

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