



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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V_R	650V
I_F	10A
Q_C	24nC

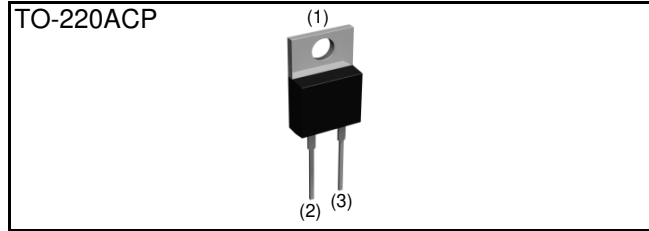
●Features

- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible
- 4) High surge current capability

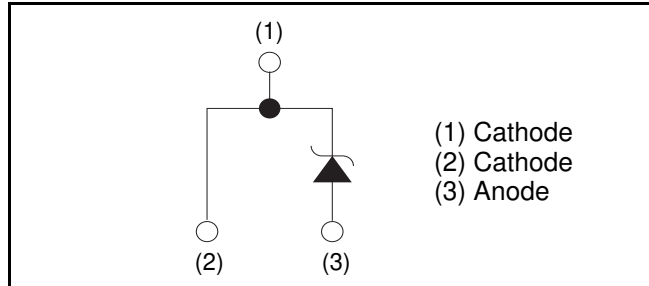
●Construction

Silicon carbide epitaxial planar type

●Outline



●Inner Circuit



●Packaging Specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	50
	Packing code	C9
	Marking	SCS310AH

●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	10	A	
Surge non-repetitive forward current	I_{FSM}	PW=10ms sinusoidal, $T_j=25^\circ\text{C}$	82	A
		PW=10ms sinusoidal, $T_j=150^\circ\text{C}$	69	A
		PW=10 μs square, $T_j=25^\circ\text{C}$	300	A
Repetitive peak forward current	I_{FRM}	45 *1	A	
i^2t value	$\int i^2 dt$	$1 \leq PW \leq 10\text{ms}$, $T_j=25^\circ\text{C}$	33	A^2s
		$1 \leq PW \leq 10\text{ms}$, $T_j=150^\circ\text{C}$	23	A^2s
Total power dissipation	P_D	71 *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°C)

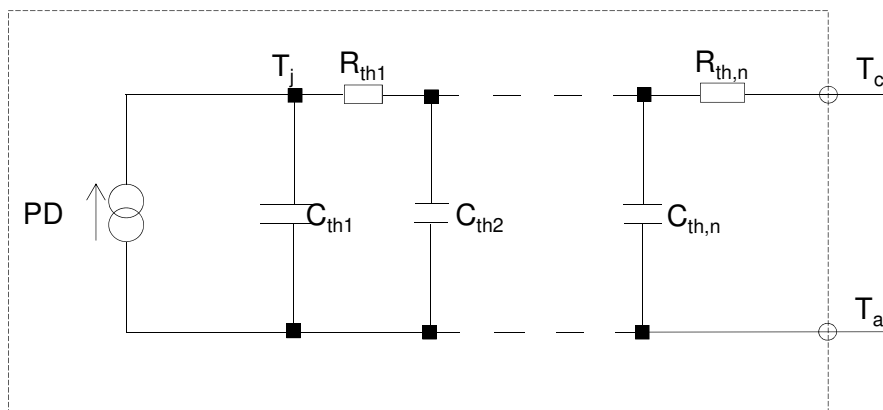
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V _{DC}	I _R =50μA	650	-	-	V
Forward voltage	V _F	I _F =10A, T _j =25°C	-	1.35	1.50	V
		I _F =10A, T _j =150°C	-	1.44	1.71	V
		I _F =10A, T _j =175°C	-	1.50	-	V
Reverse current	I _R	V _R =650V, T _j =25°C	-	0.03	50	μA
		V _R =650V, T _j =150°C	-	2	200	μA
		V _R =650V, T _j =175°C	-	6	-	μA
Total capacitance	C	V _R =1V, f=1MHz	-	500	-	pF
		V _R =650V, f=1MHz	-	46	-	pF
Total capacitive charge	Q _C	V _R =400V, di/dt=350A/μs	-	24	-	nC
Switching time	t _C	V _R =400V, di/dt=350A/μs	-	15	-	ns
Non-repetitive Avaranche Energy	E _{ava}	L=1mH	-	130	-	mJ

●Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{th(j-c)}	-	-	1.5	2.1	°C/W

●Typical Transient Thermal Characteristics

Symbol	Value	Unit	Symbol	Value	Unit
R _{th1}	1.55E-02	K/W	C _{th1}	2.63E-04	Ws/K
R _{th2}	1.46E-01		C _{th2}	1.00E-03	
R _{th3}	1.32E+00		C _{th3}	2.13E-03	



●Electrical characteristic curves

Fig.1 $V_F - I_F$ Characteristics

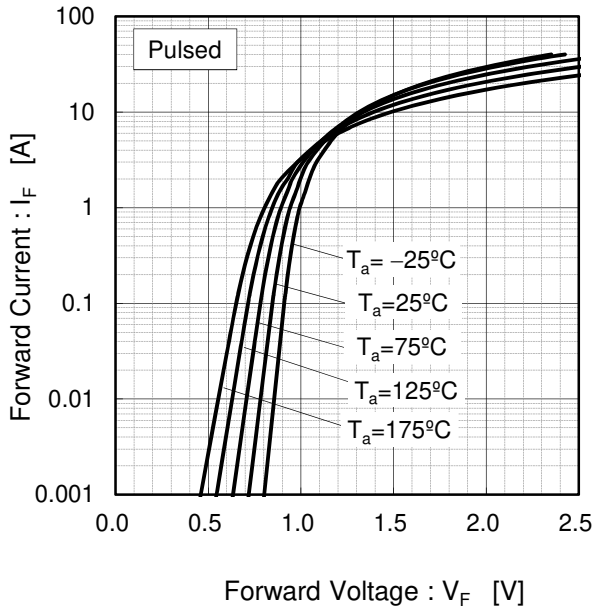


Fig.2 $V_F - I_F$ Characteristics

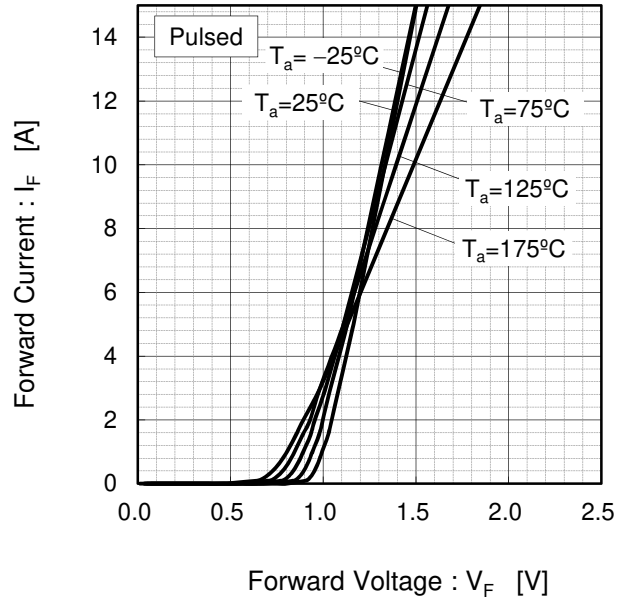


Fig.3 $V_R - I_R$ Characteristics

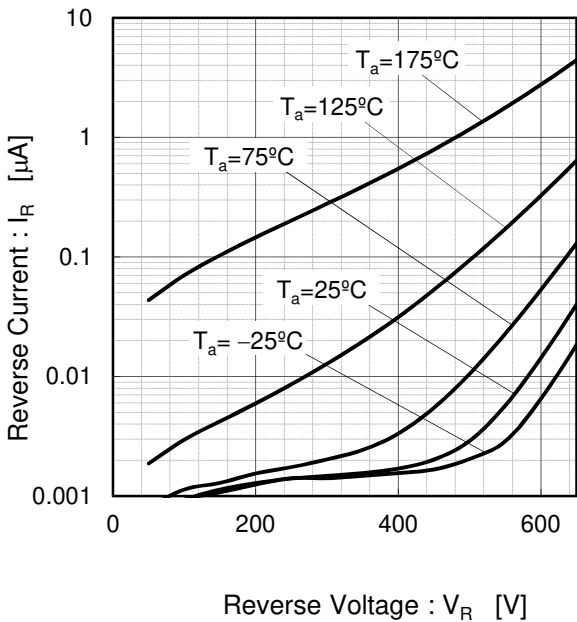
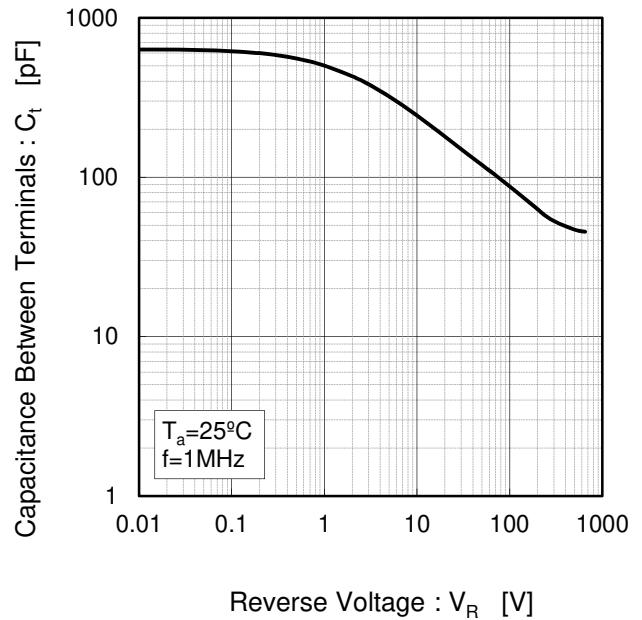


Fig.4 $V_R - C_t$ Characteristics



●Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

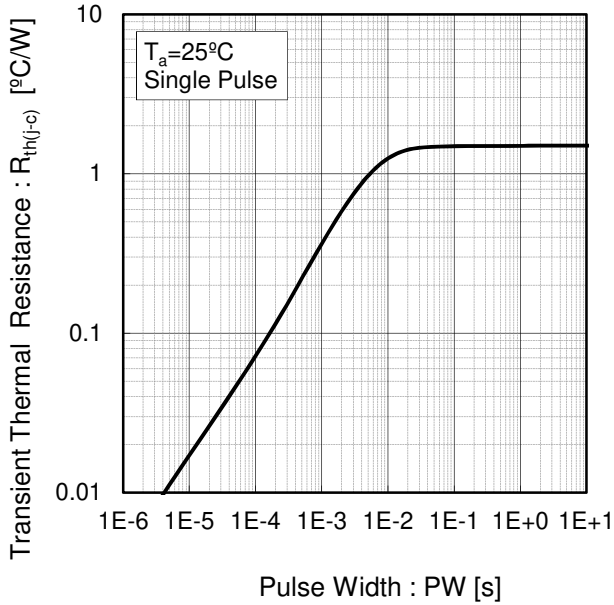


Fig.6 Power Dissipation

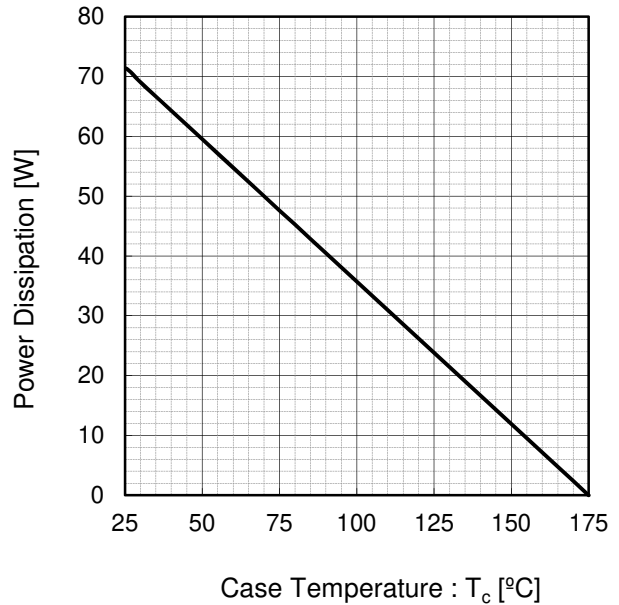
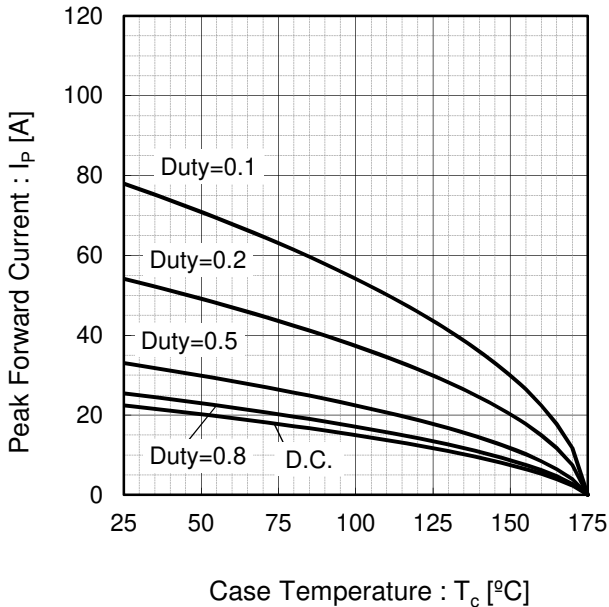
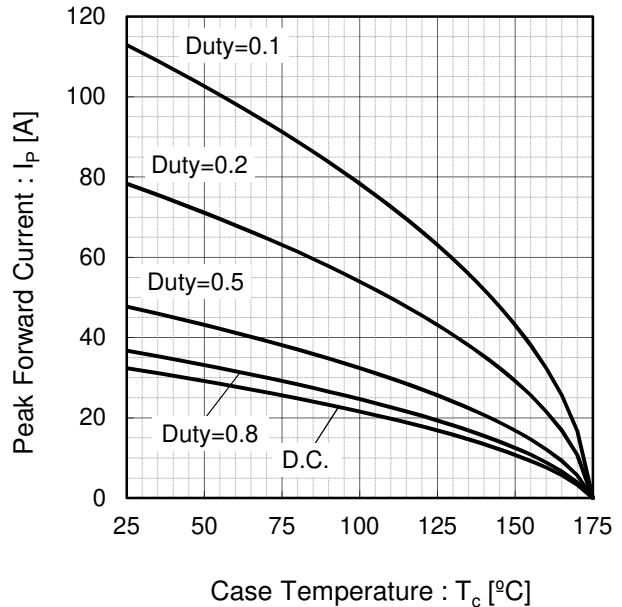


Fig.7*3 Maximum peak forward current derating curve $I_P - T_c$



*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)

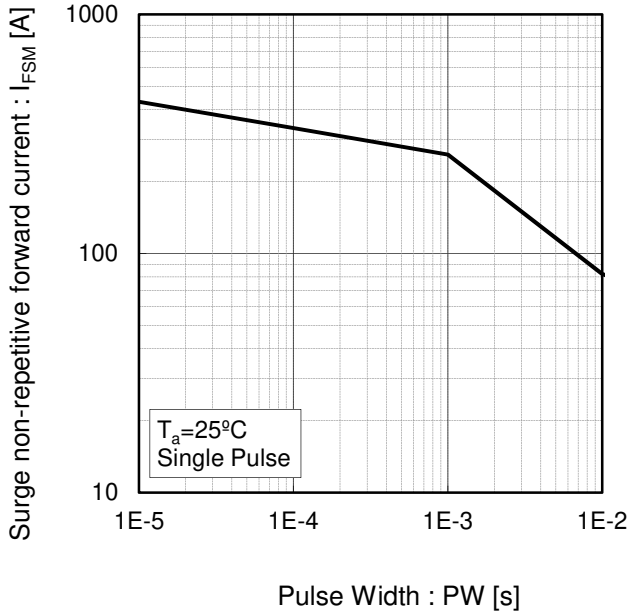


Fig.10 Typical capacitance store energy

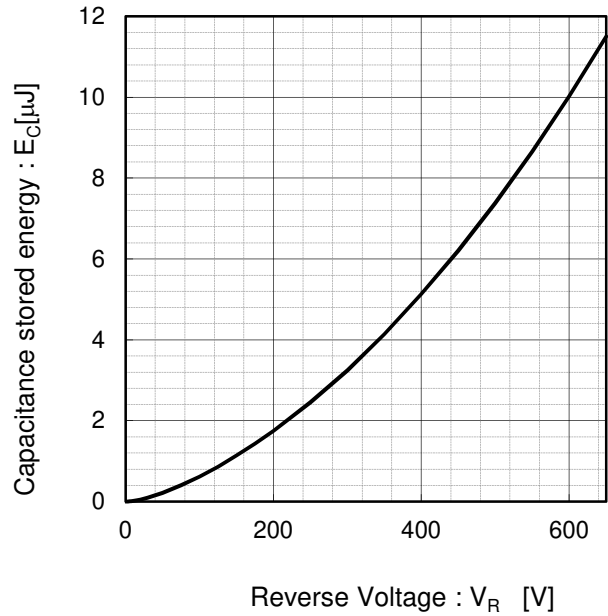
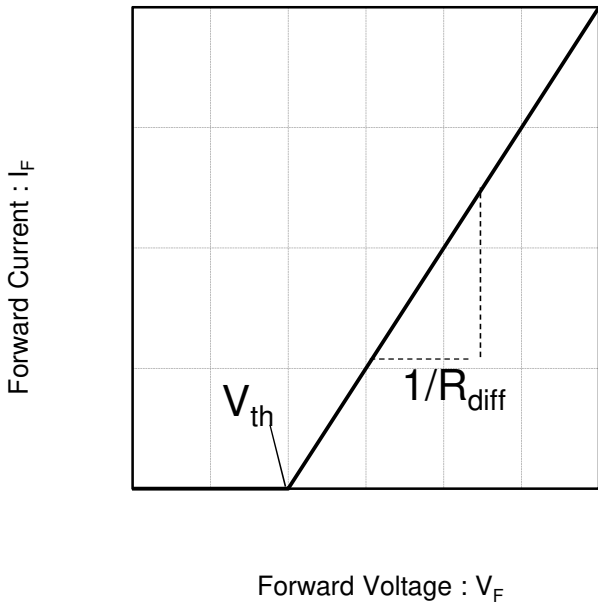


Fig.11 Equivalent forward current curve



$$V_F = V_{th} + R_{diff} I_F$$

$$V_{th}(T_j) = a_0 + a_1 T_j$$

$$R_{diff}(T_j) = b_0 + b_1 T_j + b_2 T_j^2$$

Symbol	Typical Value	Unit
a ₀	9.66E-01	V
a ₁	- 1.10E-03	V/°C
b ₀	3.52E-02	Ω
b ₁	7.46E-05	Ω/°C
b ₂	7.68E-07	Ω/°C ²

T_j in °C; -55 °C < T_j < 175°C ; I_F < 20A

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SCS310AHG - Web Page

[Distribution Inventory](#)

Part Number	SCS310AHG
Package	TO-220ACP
Unit Quantity	1000
Minimum Package Quantity	50
Packing Type	Tube
Constitution Materials List	inquiry
RoHS	Yes