

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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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

V_R	650V
I_F	4A
Q_C	11nC

●Outline

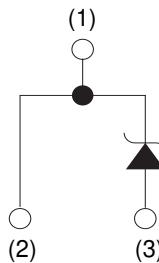
TO-220ACP



●Features

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

●Inner Circuit



(1) Cathode
(2) Cathode
(3) Anode

●Construction

Silicon carbide epitaxial planar type

●Packaging Specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	50
	Packing code	C9
	Marking	SCS304AH

●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 ($T_c=140^\circ\text{C}$)	I_F	4	A
Surge non-repetitive forward current	PW=10ms sinusoidal, $T_j=25^\circ\text{C}$	27	A
		22	A
		100	A
Repetitive peak forward current	I_{FRM}	20 *1	A
i^2t value	$\int i^2 dt$	3.6	A^2s
		2.4	A^2s
Total power dissipation	P_D	34 *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 ($T_j = 25^\circ\text{C}$)

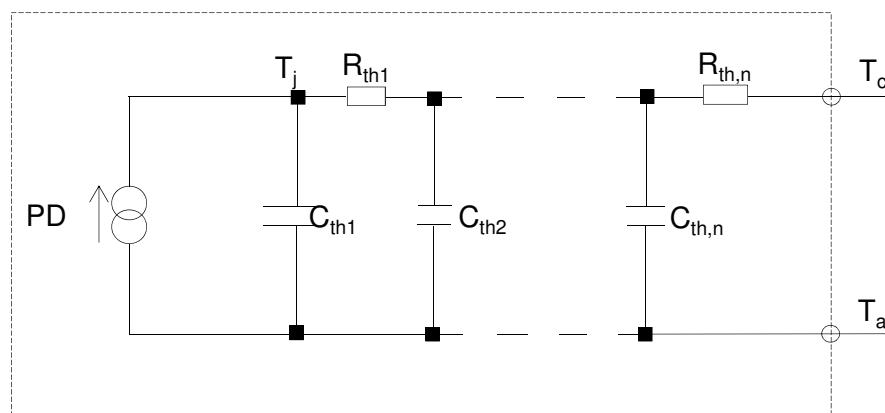
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	$I_R = 20\mu\text{A}$	650	-	-	V
Forward voltage	V_F	$I_F = 4\text{A}, T_j = 25^\circ\text{C}$	-	1.35	1.50	V
		$I_F = 4\text{A}, T_j = 150^\circ\text{C}$	-	1.44	1.71	V
		$I_F = 4\text{A}, T_j = 175^\circ\text{C}$	-	1.50	-	V
Reverse current	I_R	$V_R = 650\text{V}, T_j = 25^\circ\text{C}$	-	0.012	20.0	μA
		$V_R = 650\text{V}, T_j = 150^\circ\text{C}$	-	0.8	80	μA
		$V_R = 650\text{V}, T_j = 175^\circ\text{C}$	-	2.4	-	μA
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$	-	200	-	pF
		$V_R = 650\text{V}, f = 1\text{MHz}$	-	18	-	pF
Total capacitive charge	Q_C	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	11	-	nC
Switching time	t_C	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	14	-	ns
Non-repetitive Avalanche Energy	E_{ava}	$L = 1\text{mH}$	-	48	-	mJ

● Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	-	-	3.0	4.4	°C/W

● Typical Transient Thermal Characteristics

Symbol	Value	Unit	Symbol	Value	Unit
R_{th1}	3.91E-02	K/W	C_{th1}	1.01E-04	Ws/K
R_{th2}	3.76E-01		C_{th2}	4.02E-04	
R_{th3}	2.54E+00		C_{th3}	1.19E-03	



● Electrical characteristic curves

Fig.1 V_F - I_F Characteristics

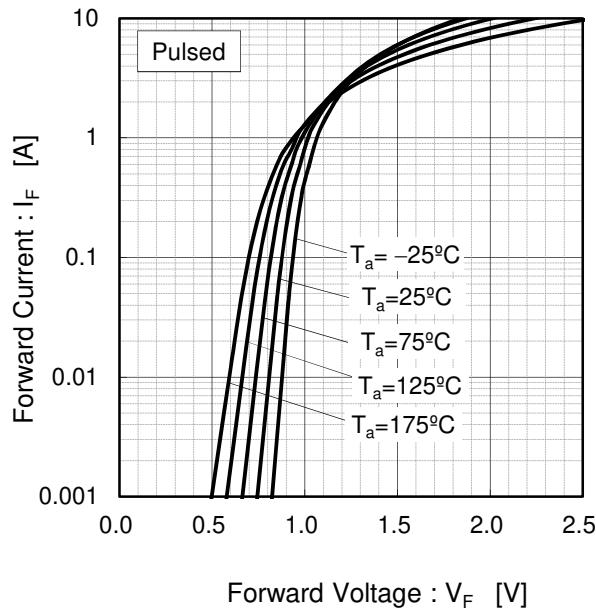


Fig.2 V_F - I_F Characteristics

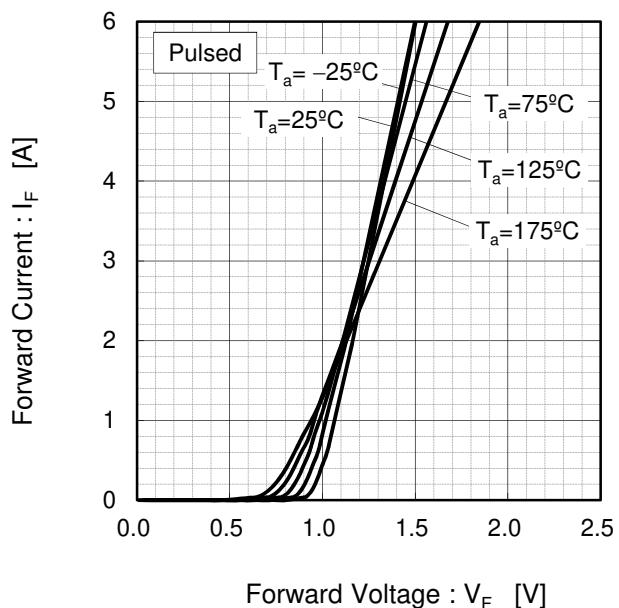


Fig.3 V_R - I_R Characteristics

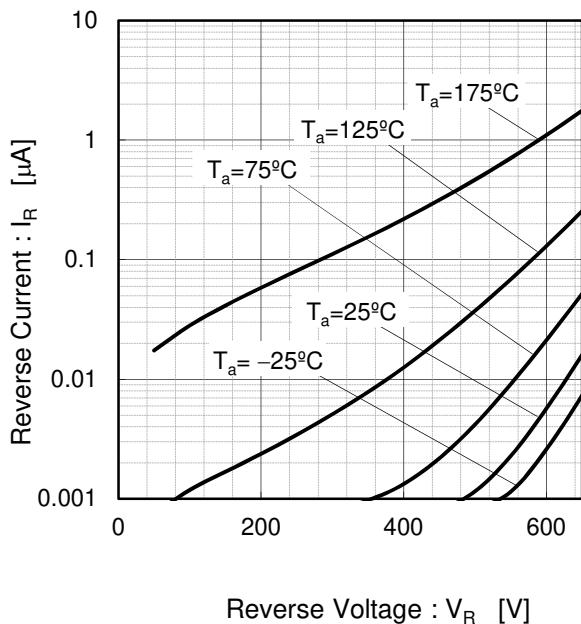
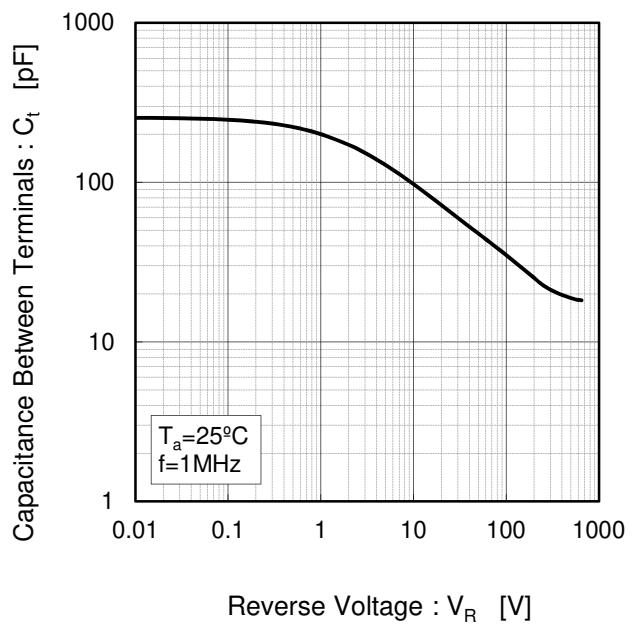


Fig.4 V_R - C_t Characteristics



●Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

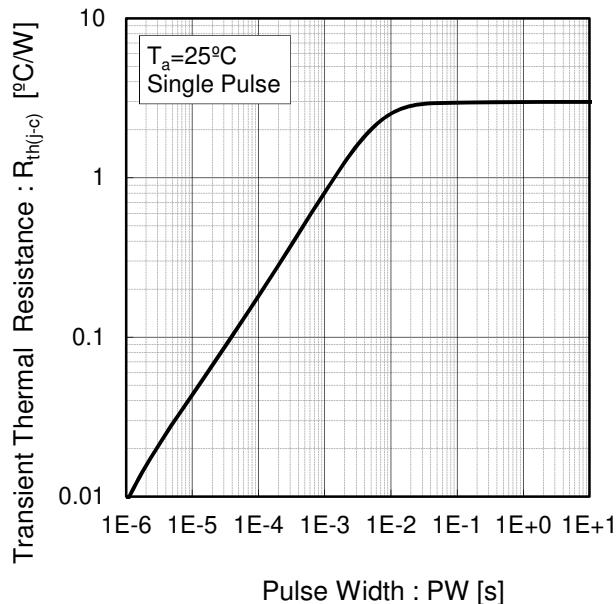


Fig.6 Power Dissipation

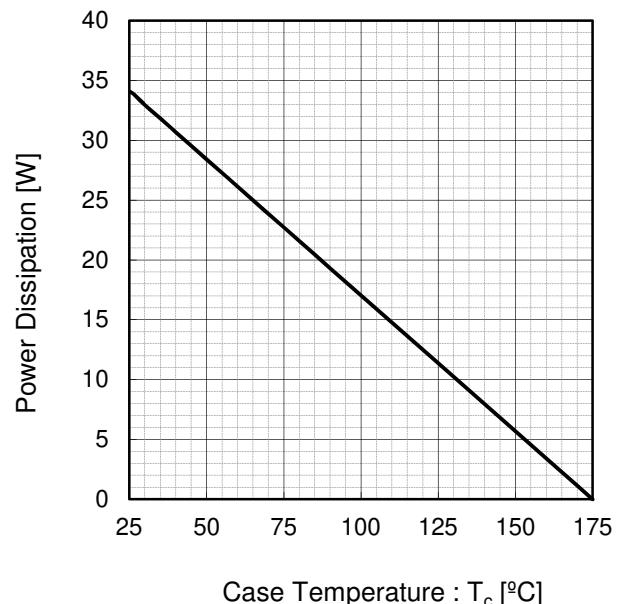
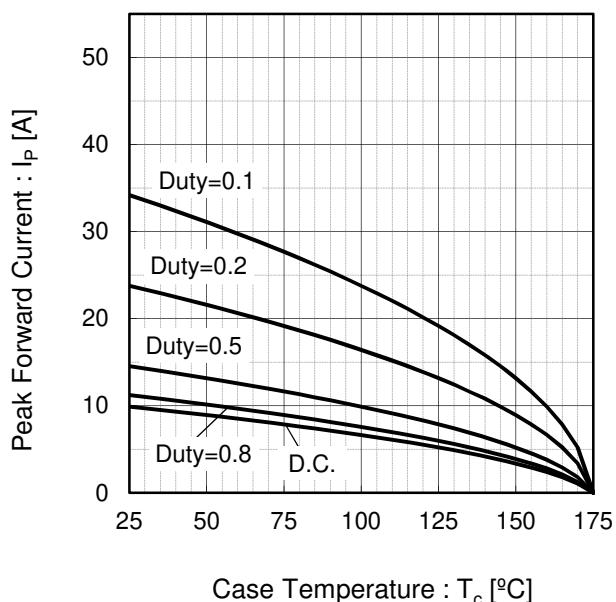
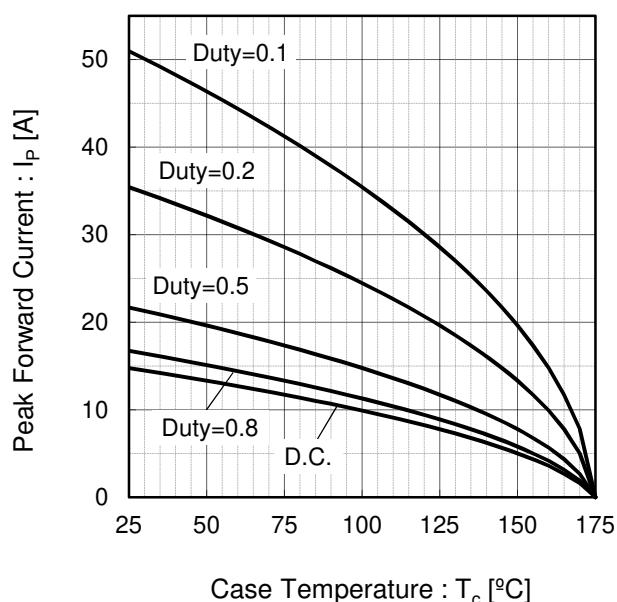


Fig.7*³ Maximum peak forward current derating curve $I_P - T_c$



*3 Based on max 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)

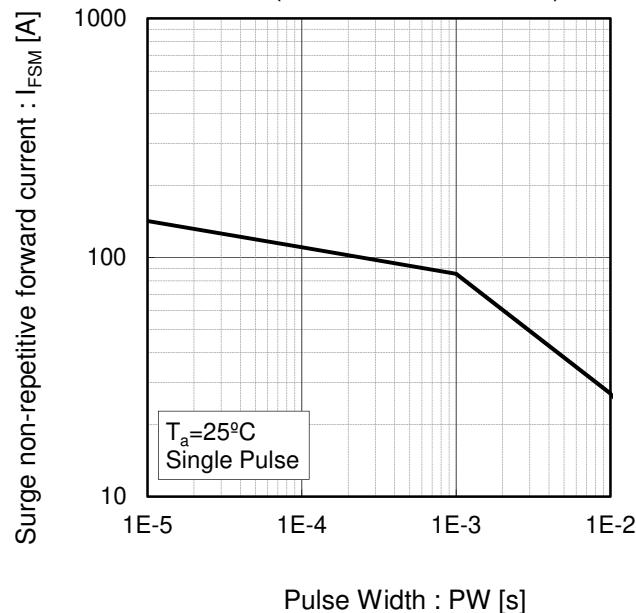


Fig.10 Typical capacitance store energy

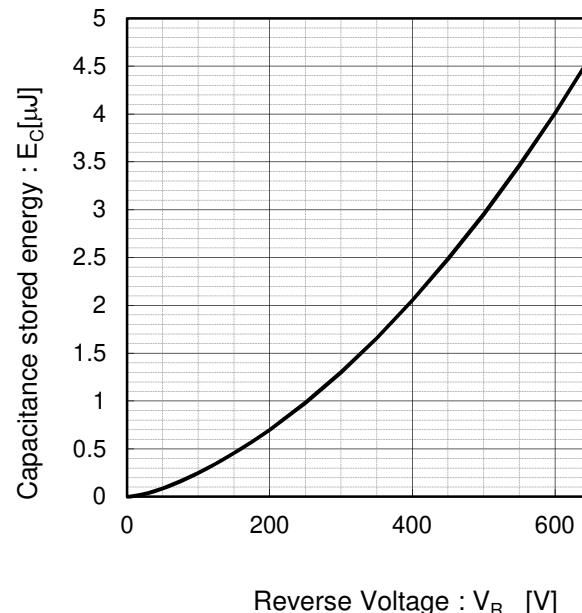
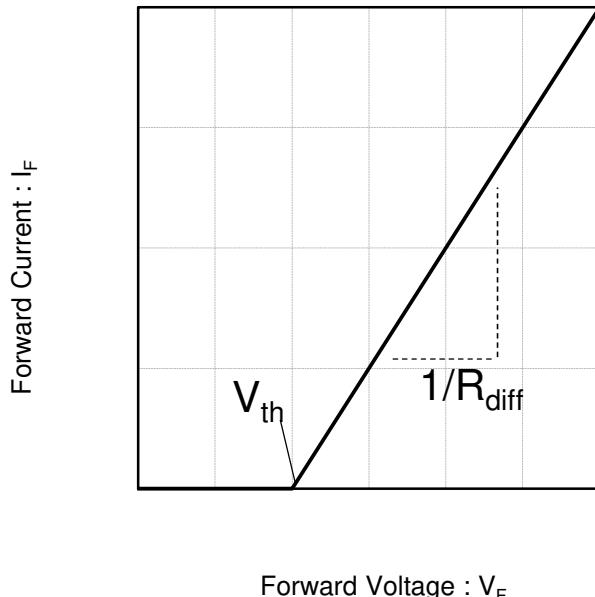


Fig.11 Equivalent forward current curve



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

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

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

Symbol	Typical Value	Unit
a_0	9.66E-01	V
a_1	-1.10E-03	V/°C
b_0	8.80E-02	Ω
b_1	1.87E-04	Ω/°C
b_2	1.92E-06	Ω/°C ²

T_j in °C; $-55^\circ\text{C} < T_j < 175^\circ\text{C}$; $I_F < 8\text{A}$

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SCS304AHG - Web Page[Distribution Inventory](#)

Part Number	SCS304AHG
Package	TO-220ACP
Unit Quantity	1000
Minimum Package Quantity	50
Packing Type	Tube
Constitution Materials List	inquiry
RoHS	Yes