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

SCS302AP

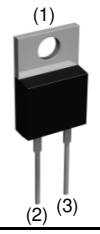
SiC Schottky Barrier Diode

Datasheet

V_R	650V
I_F	2A
Q_C	6nC

●Outline

TO-220ACP



●Features

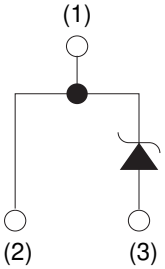
1) Shorter recovery time

2) Reduced temperature dependence

3) High-speed switching possible

4) High surge current capability

●Inner circuit



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

●Packaging specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	50
	Packing code	C9
	Marking	SCS302AP

●Construction

Silicon carbide epitaxial planar type

●Absolute maximum ratings (T_j = 25°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= 145°C)		I_F	2	A
Surge non-repetitive forward current	PW=10ms sinusoidal, T_j=25°C	I_{FSM}	19	A
	PW=10ms sinusoidal, T_j=150°C		16	A
	PW=10μs square, T_j=25°C		70	A
Repetitive peak forward current		I_{FRM}	12 *1	A
i^2t value	1≦PW≦10ms, T_j=25°C	$\int i^2dt$	1.8	A^2s
	1≦PW≦10ms, T_j=150°C		1.2	A^2s
Total power disspation		P_D	22 *2	W
Junction temperature		T_j	175	°C
Range of storage temperature		T_{stg}	−55 to +175	°C

*1 T_c=100°C, T_j=150°C, Duty cycle=10% *2 T_c=25°C

●Electrical characteristics (T_j = 25°C)

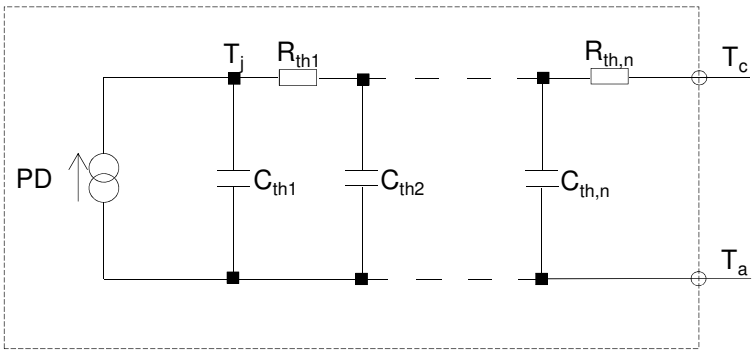
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	I_R =10.8μA	650	-	-	V
Forward voltage	V_F	I_F=2A,T_j=25°C	-	1.35	1.50	V
		I_F=2A,T_j=150°C	-	1.44	1.71	V
		I_F=2A,T_j=175°C	-	1.50	-	V
Reverse current	I_R	V_R=650V,T_j=25°C	-	0.0065	10.8	μA
		V_R=650V,T_j=150°C	-	0.43	43	μA
		V_R=650V,T_j=175°C	-	1.29	-	μA
Total capacitance	C	V_R=1V,f=1MHz	-	110	-	pF
		V_R=650V,f=1MHz	-	10	-	pF
Total capacitive charge	Q_C	V_R=400V,di/dt=350A/μs	-	6	-	nC
Switching time	t_C	V_R=400V,di/dt=350A/μs	-	11	-	ns
Non-repetetive Avaranche Energy	E_{ava}	L=1mH	-	18	-	mJ

●Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	-	-	4.5	6.7	°C/W

●Typical Transient Thermal Characteristics

Symbol	Value	Unit	Symbol	Value	Unit
R_{th1}	8.21E-02	K/W	C_{th1}	6.35E-05	Ws/K
R_{th2}	5.99E-01		C_{th2}	2.10E-04	
R_{th3}	3.80E+00		C_{th3}	8.17E-04	



●Electrical characteristic curves

Fig.1 V_F - I_F Characteristics

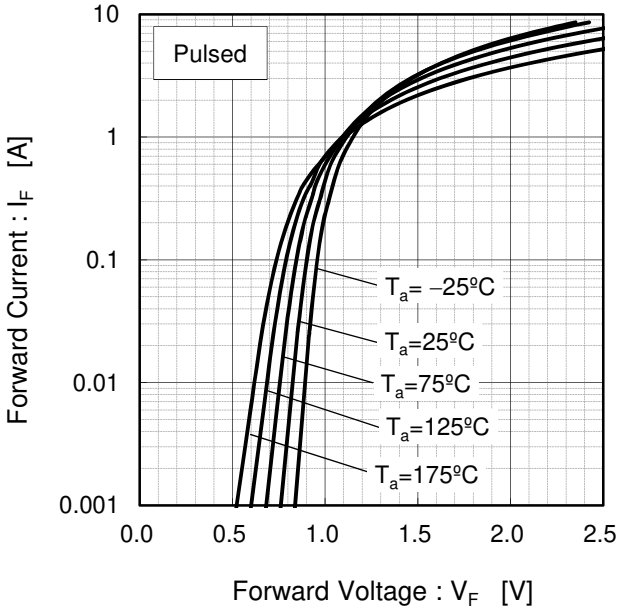


Fig.2 V_F - I_F Characteristics

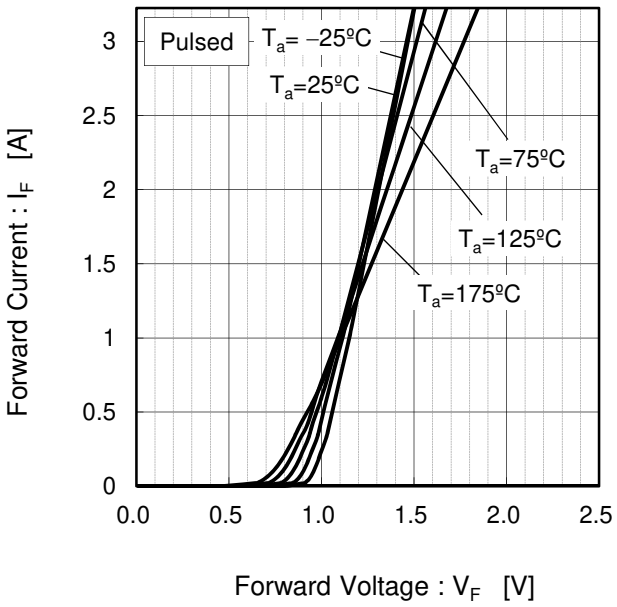


Fig.3 V_R - I_R Characteristics

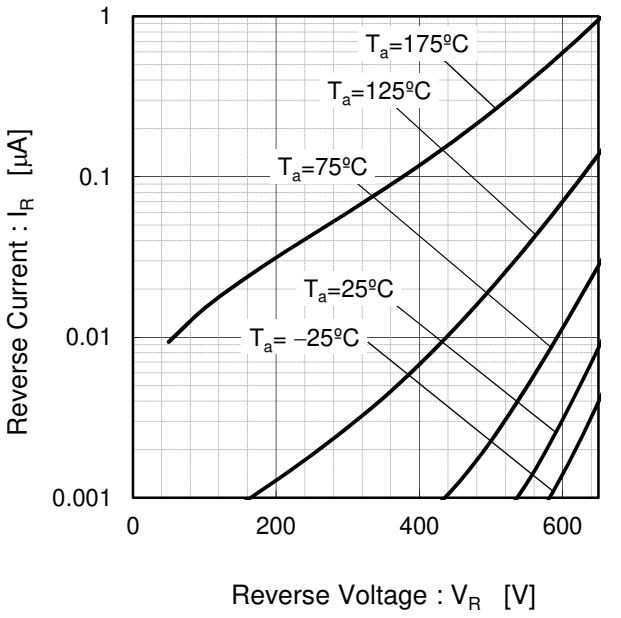
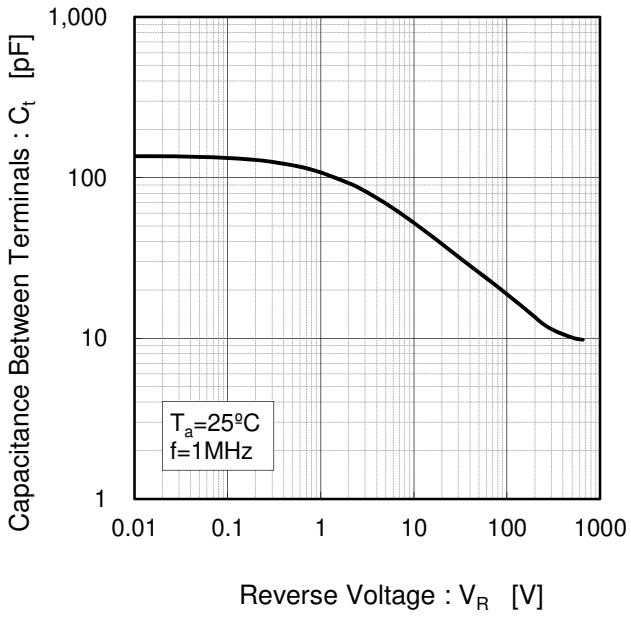


Fig.4 V_R-C_t Characteristics



●Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

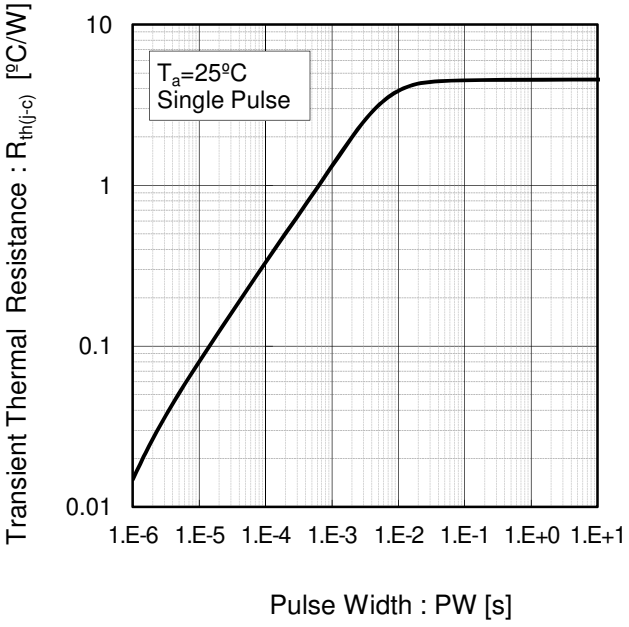


Fig.6 Power Dissipation

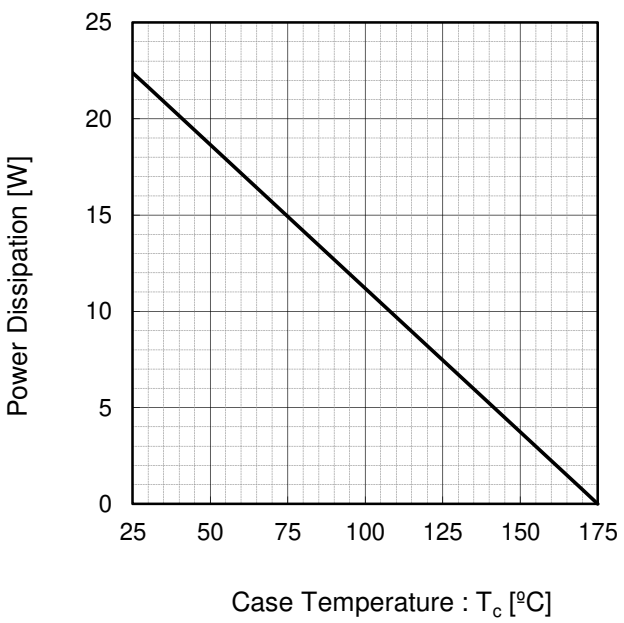
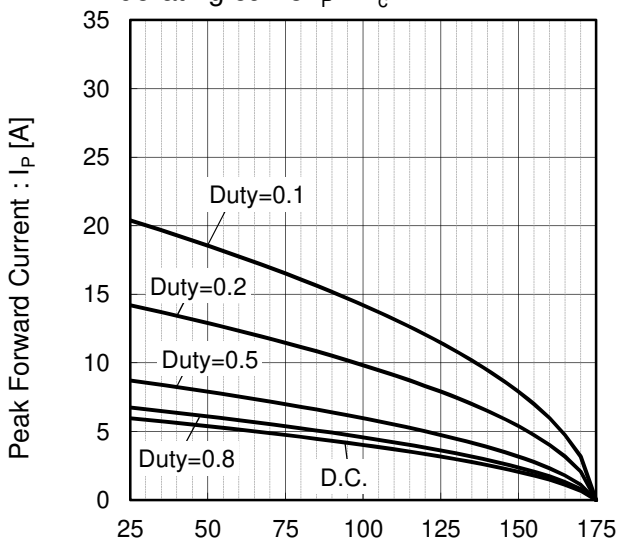
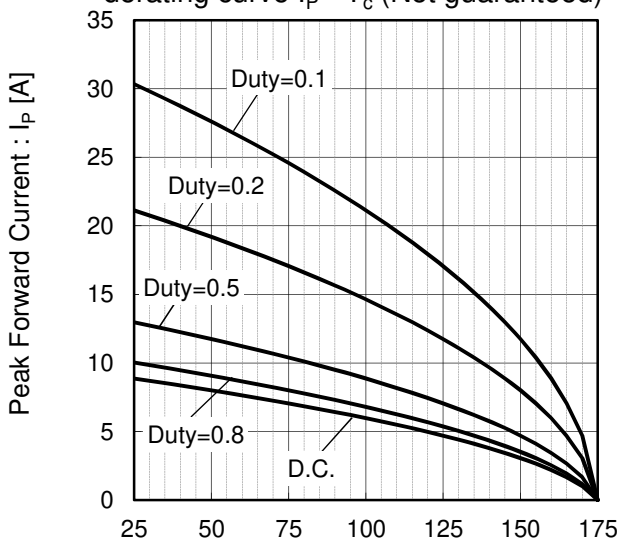


Fig.7*3 Maximum peak forward current derating curve I_P - T_c



*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)

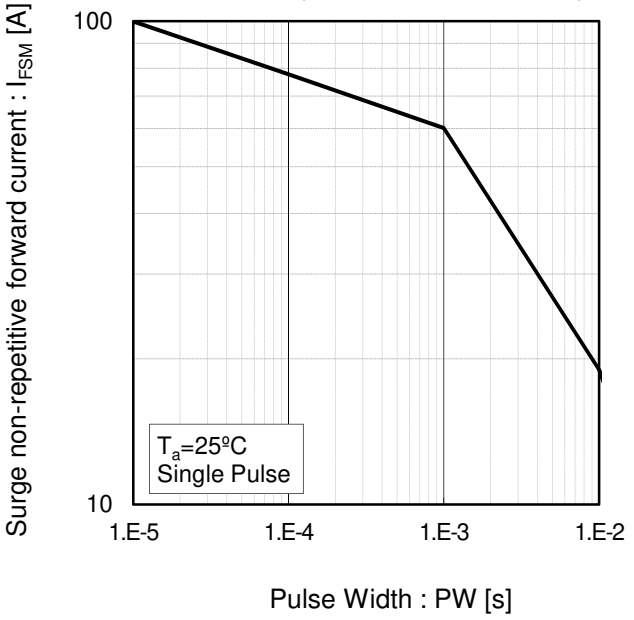
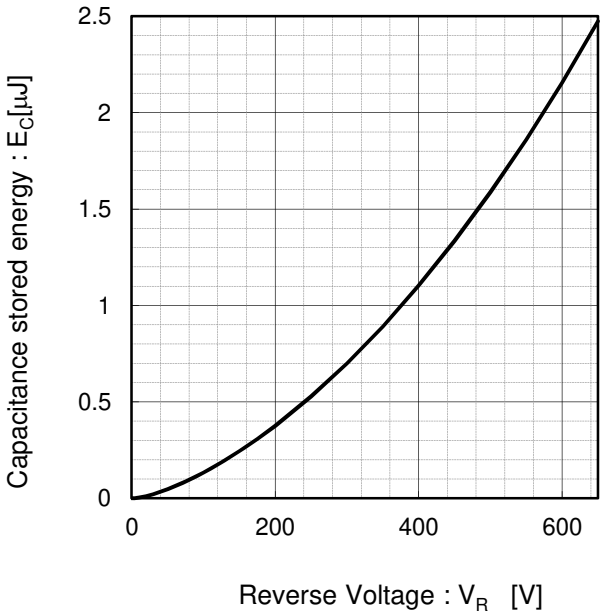
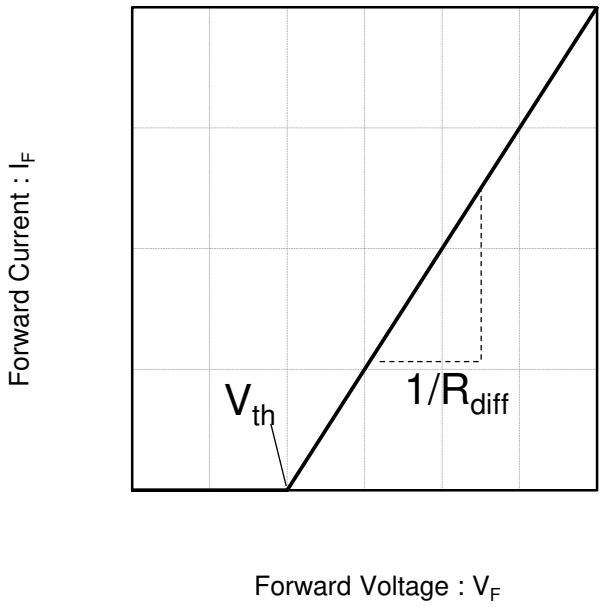


Fig.10 Typical capacitance store energy



●Symplified 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-0.3	V/°C
b_0	1.64E-01	Ω
b_1	3.47E-04	Ω/°C
b_2	3.57E-06	Ω/°C^2

T_j in ºC; −55 ºC < T_j < 175ºC ; I_F <4 A

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