S6305

SiC Schottky Barrier Diode

Datasheet

V_R	1200V
I_F	50A*1
Q_C	88nC

●Features

1) Shorter recovery time

2) Reduced temperature dependence

3) High-speed switching possible

●Inner Circuit

(C) Cathode
(A) Anode

●Construction

Silicon carbide epitaxial planar type

Schottky diode

●Absolute Maximum Ratings (T_j = 25°C)

Parameter		Symbol	Value	Unit
Reverse voltage (repetitive peak)		V_{RM}	1200	V
Reverse voltage (DC)		V_R	1200	V
Continuous forward current		I_F	50	A
Surge non-repetitive forward current	PW=10ms sinusoidal, T_j=25°C	I_{FSM}*2	190	A
	PW=10ms sinusoidal, T_j=150°C		140	A
	PW=10μs square, T_j=25°C		780	A
i^2t value	1≦PW≦10ms, T_j=25°C	$\int i^2dt$*2	195	A^2s
	1≦PW≦10ms, T_j=150°C		109	A^2s
Junction temperature		T_j	175	°C
Range of storage temperature		T_{stg}	−55 to +175	°C

*1 Limited by T_j *2 Assumes $Z_{th(j-a)}$ of 0.26 °C/W or less. (Pulse Width = 8.3ms)

●**Electrical characteristics** (T_j = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	I_R =1.0mA	1200	-	-	V
Forward voltage	V_F	I_F=50A,T_j=25°C	-	1.4	1.6	V
		I_F=50A,T_j=150°C	-	1.8	-	V
		I_F=50A,T_j=175°C	-	1.9	-	V
Reverse current	I_R	V_R=1200V,T_j=25°C	-	50	1000	μA
		V_R=1200V,T_j=150°C	-	400	-	μA
		V_R=1200V,T_j=175°C	-	650	-	μA
Total capacitance	C	V_R=1V,f=1MHz	-	2600	-	pF
		V_R=800V,f=1MHz	-	210	-	pF
Total capacitive charge	Q_C	V_R=800V,di/dt=500A/μs	-	88	-	nC
Switching time	t_C	V_R=800V,di/dt=500A/μs	-	48	-	ns

●Electrical characteristic curves

Fig.1 V_F - I_F Characteristics

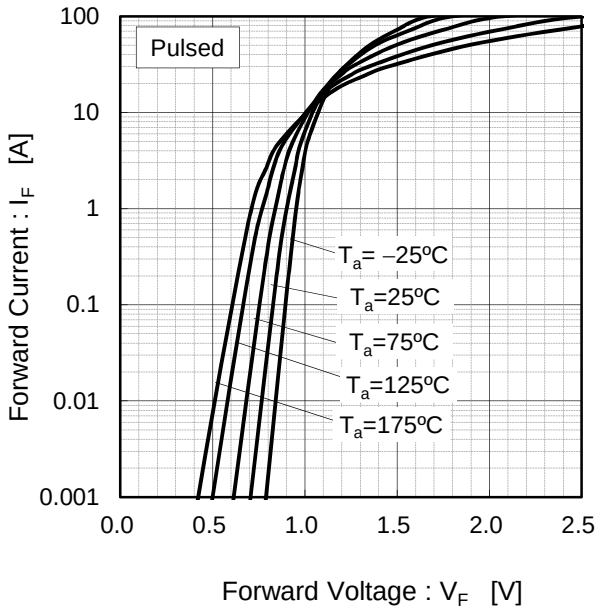


Fig.2 V_F - I_F Characteristics

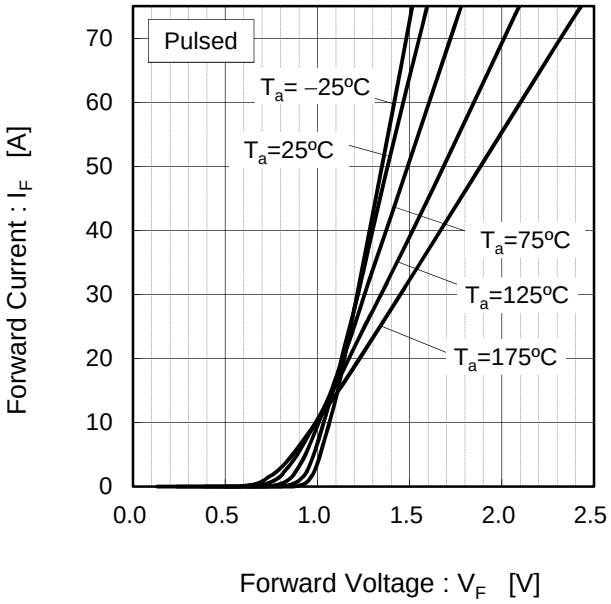


Fig.3 V_R - I_R Characteristics

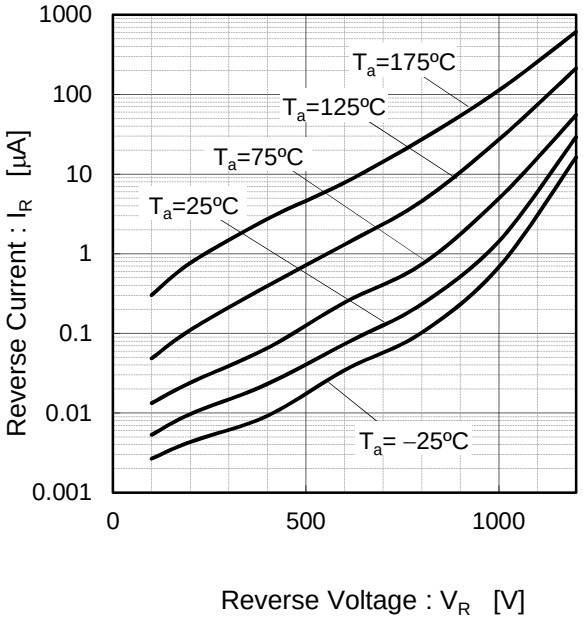
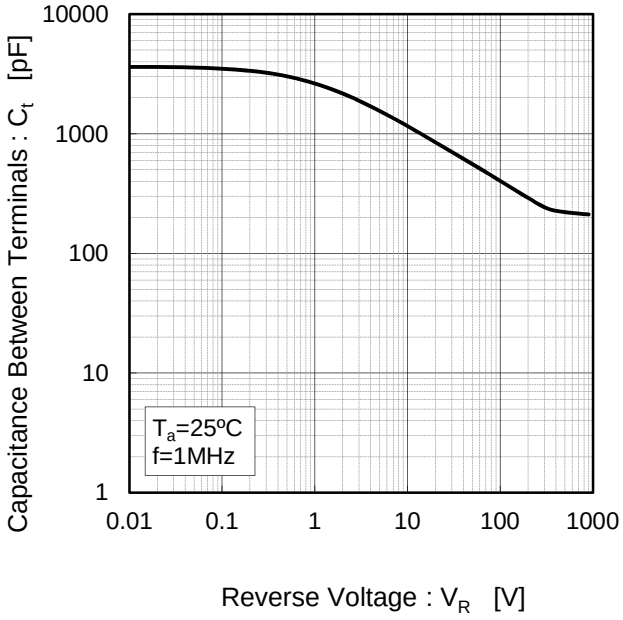


Fig.4 V_R-C_t Characteristics



●Electrical characteristic curves

Fig.5 Surge non-repetitive forward current vs. Pulse width (Sinusoidal waveform)

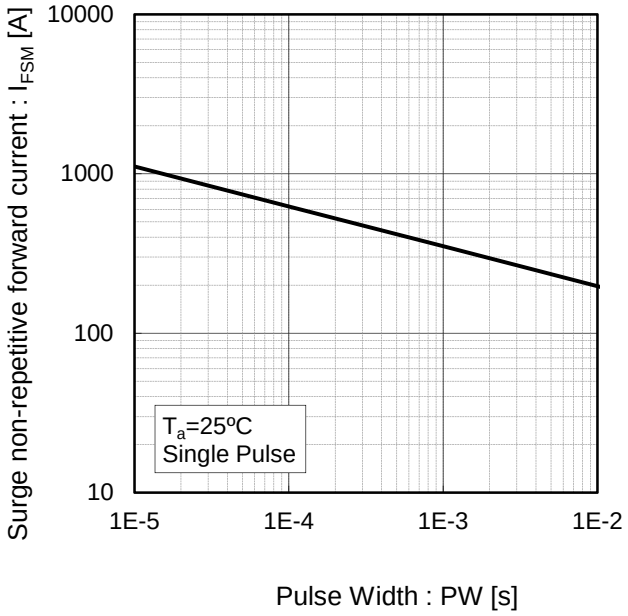


Fig.6 Typical capacitance store energy

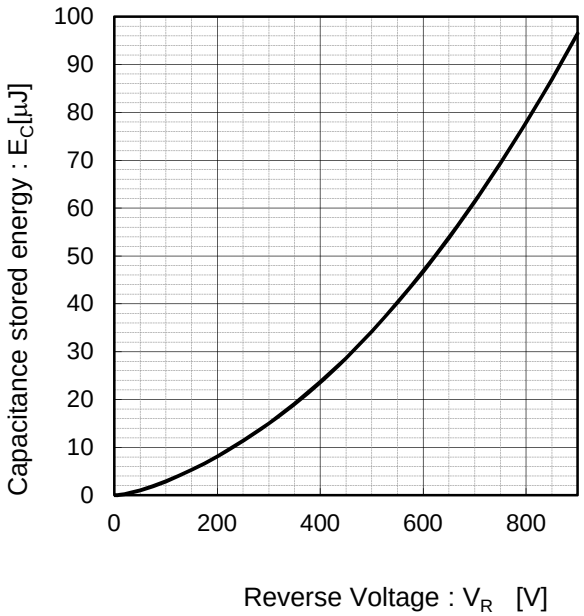
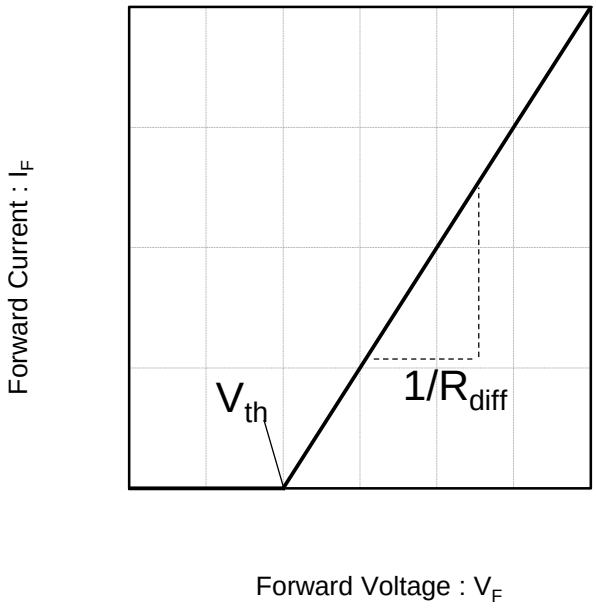


Fig.7 Equivalent forward current curve



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

$$V_{th}(T_j) = a_0 + a_1 T_j$$
$$R_{diff}(T_j) = b_0 + b_1 T_j + b_2 T_j^2$$

Symbol	Typical Value	Unit
a_0	9.93E-01	V
a_1	−1.27E-0.3	V/°C
b_0	7.30E-03	Ω
b_1	4.12E-05	Ω/°C
b_2	2.66E-07	Ω/°C^2

T_j in ºC; -55 ºC < T_j < ºC ; I_F < 100A

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