

# SiC Schottky Barrier Diode

## SCS140AE2

● **Applications**

Switching power supply

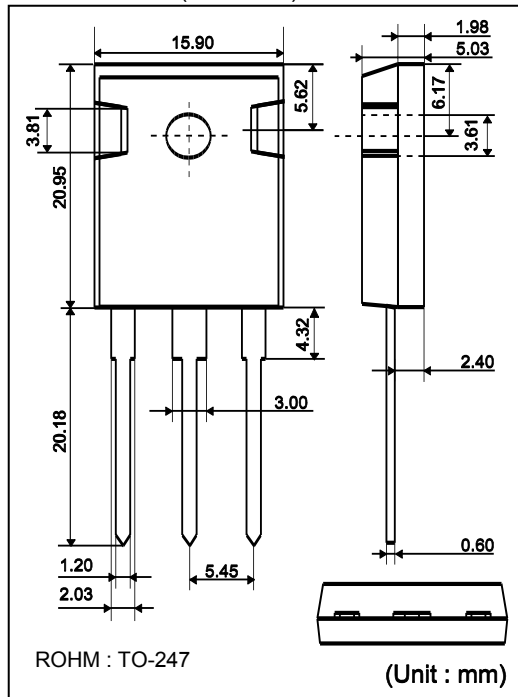
● **Features**

- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible

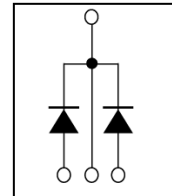
● **Construction**

Silicon carbide epitaxial planer type

● **Dimensions (Unit : mm)**



● **Structure**



● **Absolute maximum ratings (Tj=25°C)**

Parameter	Symbol	Limits	Unit
Reverse voltage (repetitive peak)	$V_{RM}$	600	V
Reverse voltage (DC)	$V_R$	600	V
Continuous forward current* <sup>6</sup>	$I_F$	20 / 40* <sup>1</sup>	A
Surge no repetitive forward current* <sup>6</sup>	$I_{FSM}$	76 / 152* <sup>2</sup>	A
		300 / 600* <sup>3</sup>	A
Repetitive peak forward current* <sup>6</sup>	$I_{FRM}$	72 / 121* <sup>4</sup>	A
Total power dissipation* <sup>6</sup>	$P_D$	120 / 210* <sup>5</sup>	W
Junction temperature	$T_j$	175	°C
Range of storage temperature	$T_{stg}$	-55 to +175	°C
Junction to case * <sup>6</sup>	$R_{th(j-c)}$	1.2 / 0.70	°C / W

(\*1)  $T_c=121^\circ\text{C}$  /  $T_c=112^\circ\text{C}$  (\*2)  $PW=8.3\text{ms}$  sinusoidal,  $T_j=25^\circ\text{C}$

(\*3)  $PW=10\mu\text{s}$  square,  $T_j=25^\circ\text{C}$  (\*4)  $T_c=95^\circ\text{C}$ ,  $T_j=125^\circ\text{C}$ , Duty cycle=10% (\*5)  $T_c=25^\circ\text{C}$  (\*6) Per Leg / Per Device

● **Electrical characteristics (Tj=25°C) [Per Leg]**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
DC blocking voltage	$V_{DC}$	600	-	-	V	$I_R=0.4\text{mA}$
Forward voltage	$V_F$	-	1.5	1.7	V	$I_F=20\text{A}$ , $T_j=25^\circ\text{C}$
		-	1.82	-	V	$I_F=20\text{A}$ , $T_j=175^\circ\text{C}$
Reverse current	$I_R$	-	4	400	$\mu\text{A}$	$V_R=600\text{V}$ , $T_j=25^\circ\text{C}$
		-	80	-	$\mu\text{A}$	$V_R=600\text{V}$ , $T_j=175^\circ\text{C}$
Total capacitance	$C$	-	860	-	pF	$V_R=1\text{V}$ , $f=1\text{MHz}$
		-	93	-	pF	$V_R=600\text{V}$ , $f=1\text{MHz}$
Total capacitive charge	$Q_C$	-	35	-	nC	$V_R=400\text{V}$ , $di/dt=350\text{A}/\mu\text{s}$
Switching time	$t_c$	-	19	-	ns	$V_R=400\text{V}$ , $di/dt=350\text{A}/\mu\text{s}$

Fig.1  $V_F$ - $I_F$  Characteristics (Per Leg)

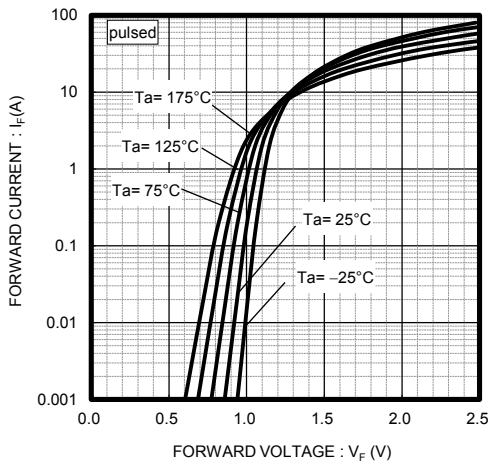


Fig.2  $V_F$ - $I_F$  Characteristics (Per Leg)

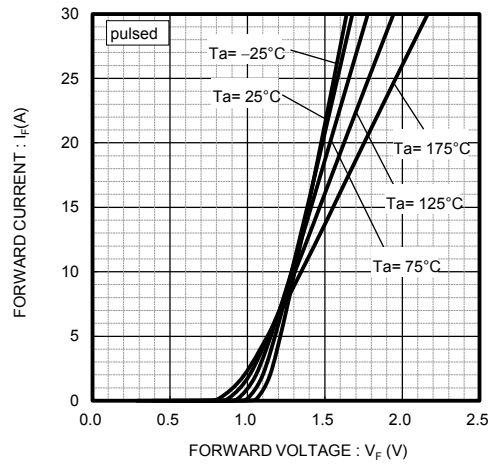


Fig.3  $V_R$ - $I_R$  Characteristics (Per Leg)

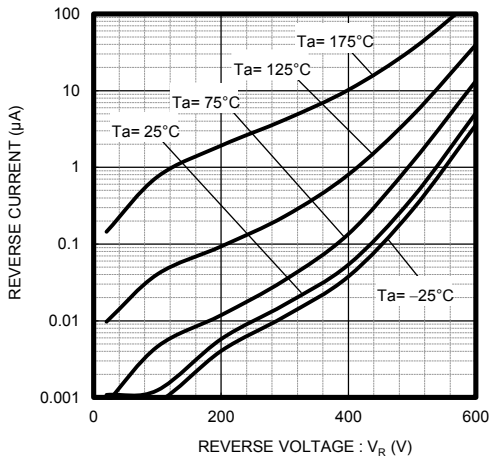


Fig.4  $V_R$ - $C_t$  Characteristics (Per Leg)

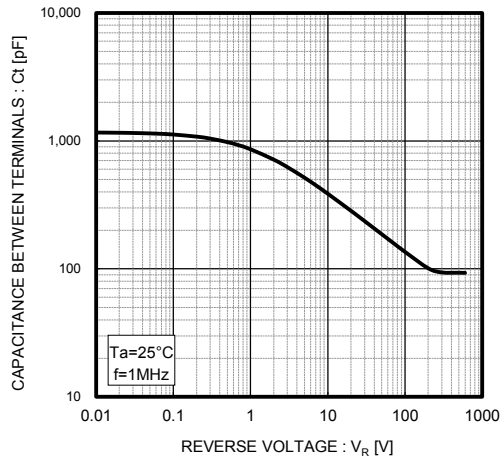


Fig.5 Thermal Resistance vs. Pulse Width

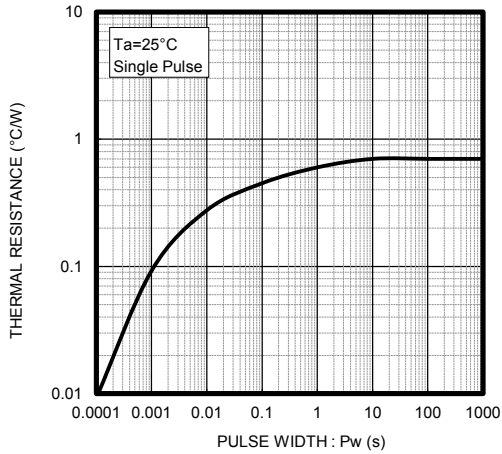


Fig.6 Power Dissipation

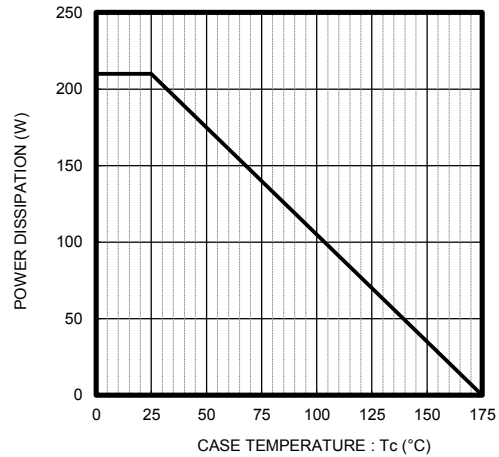


Fig.7 Derating Curve  $I_p$ - $T_c$

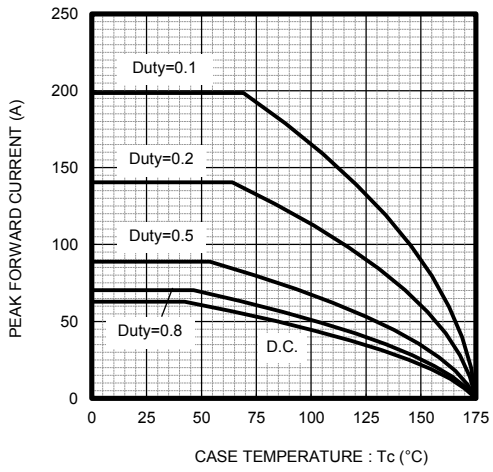
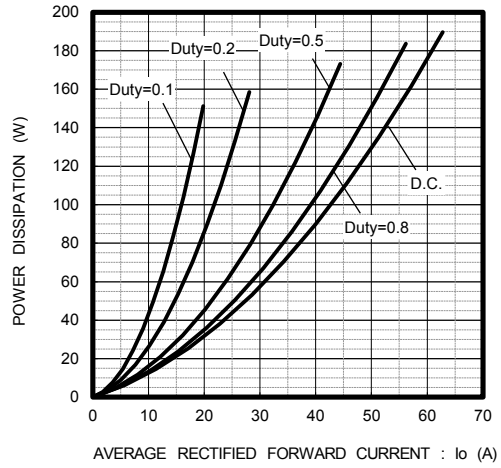


Fig.8  $I_o$ - $P_f$  Characteristics



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