

$V_R$	650V
$I_F$	10A/20A*
$Q_C$	15nC

\*(Per leg / Both legs)

## ●Features

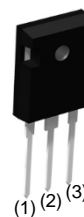
- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible

## ●Construction

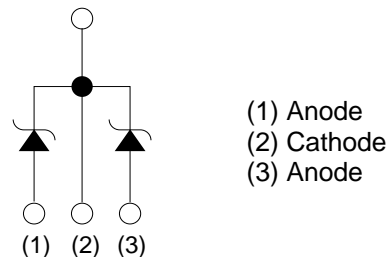
Silicon carbide epitaxial planer type

## ●Outline

TO-247



## ●Inner circuit



## ●Packaging specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	30
	Packing code	C
	Marking	SCS220AE2

## ●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 <sup>*7</sup>	$I_F$	10/20 <sup>*1</sup>	A
Surge no repetitive forward current <sup>*7</sup>	$I_{FSM}$	40/80 <sup>*2</sup>	A
		150/300 <sup>*3</sup>	A
		31/63 <sup>*4</sup>	A
Repetitive peak forward current <sup>*7</sup>	$I_{FRM}$	42/85 <sup>*5</sup>	A
Total power dissipation <sup>*7</sup>	$P_D$	83/160 <sup>*6</sup>	W
Junction temperature	$T_j$	175	$^\circ\text{C}$
Range of storage temperature	$T_{stg}$	-55 to +175	$^\circ\text{C}$

\*1  $T_c=137^\circ\text{C}/T_c=137^\circ\text{C}$  \*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  $PW=8.3\text{ms}$  sinusoidal,  $T_j=150^\circ\text{C}$  \*5  $T_c=100^\circ\text{C}$ ,  $T_j=150^\circ\text{C}$ , Duty cycle=10%

\*6  $T_c=25^\circ\text{C}$  \*7 Per leg / Both legs

**●Electrical characteristics** ( $T_j = 25^\circ\text{C}$ ) (Per leg)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{DC}$	$I_R = 0.2\text{mA}$	600	-	-	V
Forward voltage	$V_F$	$I_F = 10\text{A}, T_j = 25^\circ\text{C}$	-	1.35	1.55	V
		$I_F = 10\text{A}, T_j = 150^\circ\text{C}$	-	1.55	-	V
		$I_F = 10\text{A}, T_j = 175^\circ\text{C}$	-	1.63	-	V
Reverse current	$I_R$	$V_R = 600\text{V}, T_j = 25^\circ\text{C}$	-	2	200	$\mu\text{A}$
		$V_R = 600\text{V}, T_j = 150^\circ\text{C}$	-	30	-	$\mu\text{A}$
		$V_R = 600\text{V}, T_j = 175^\circ\text{C}$	-	70	-	$\mu\text{A}$
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$	-	365	-	pF
		$V_R = 600\text{V}, f = 1\text{MHz}$	-	37	-	pF
Total capacitive charge	Qc	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	15	-	nC
Switching time	tc	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	15	-	ns

**●Thermal characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	Per Leg	-	1.6	1.8	$^\circ\text{C}/\text{W}$
		Both Legs	-	0.8	0.9	$^\circ\text{C}/\text{W}$

●Electrical characteristic curves

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

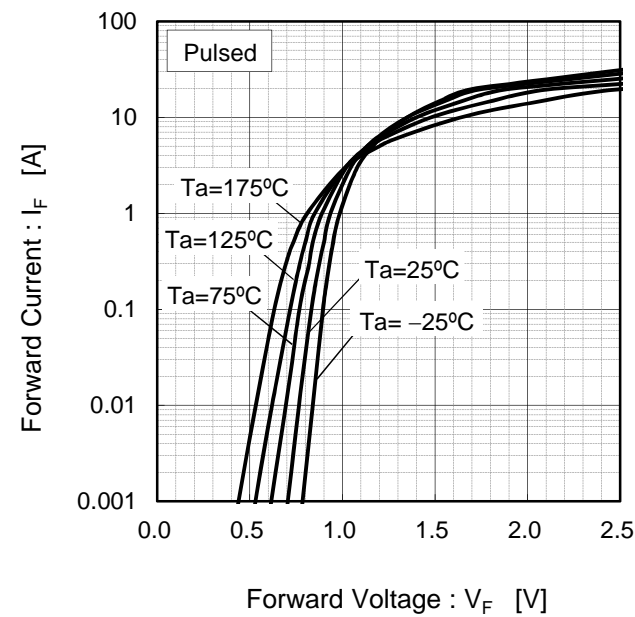


Fig.2  $V_F - I_F$  Characteristics (Per leg)

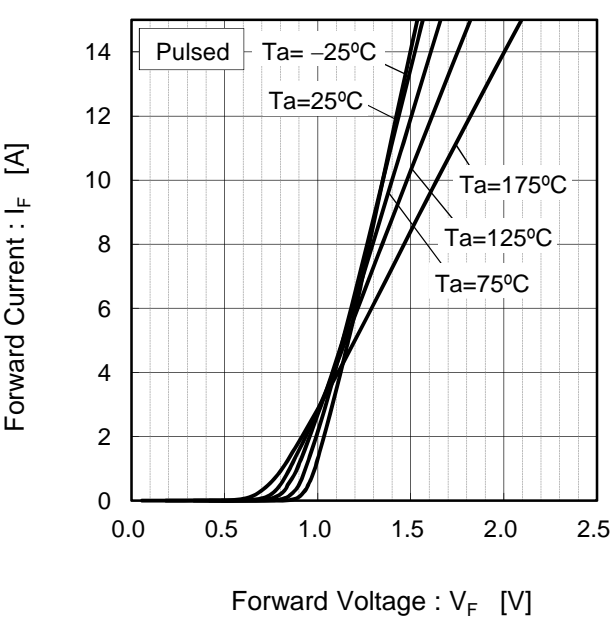


Fig.3  $V_R - I_R$  Characteristics (Per leg)

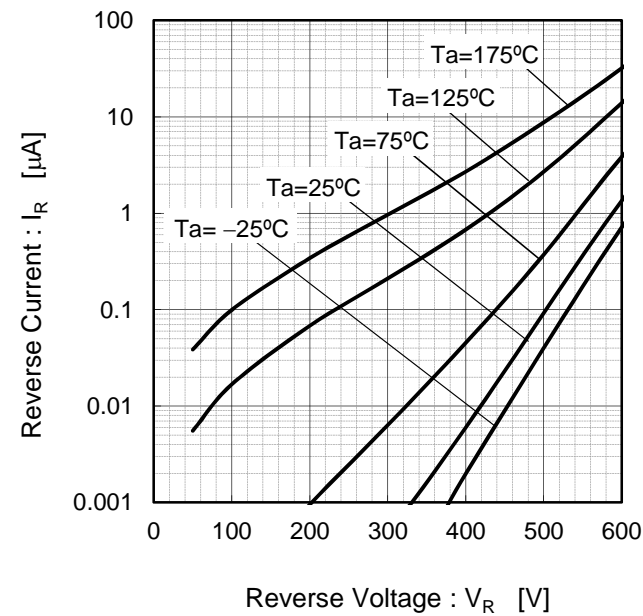
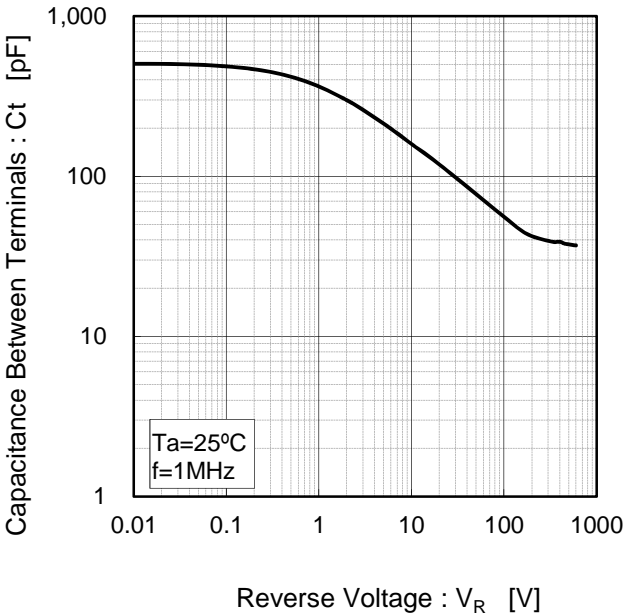


Fig.4  $V_R - C_t$  Characteristics (Per leg)



●Electrical characteristic curves

Fig.5 Thermal Resistance vs. Pulse Width (Per leg)

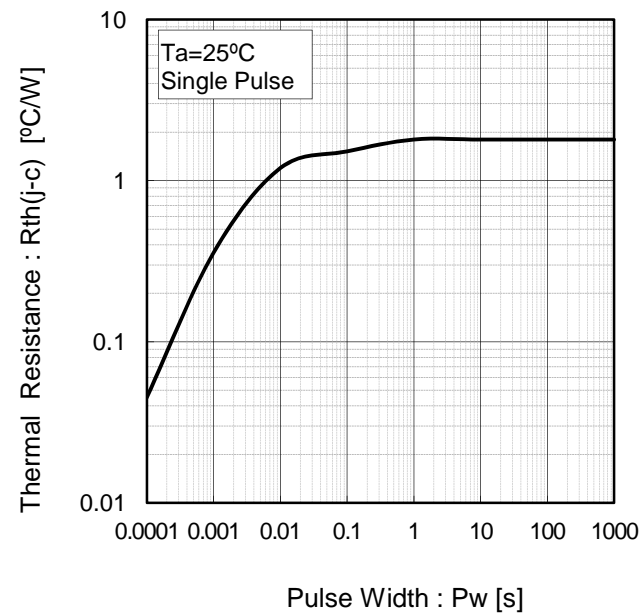


Fig.6 Power Dissipation (Per leg)

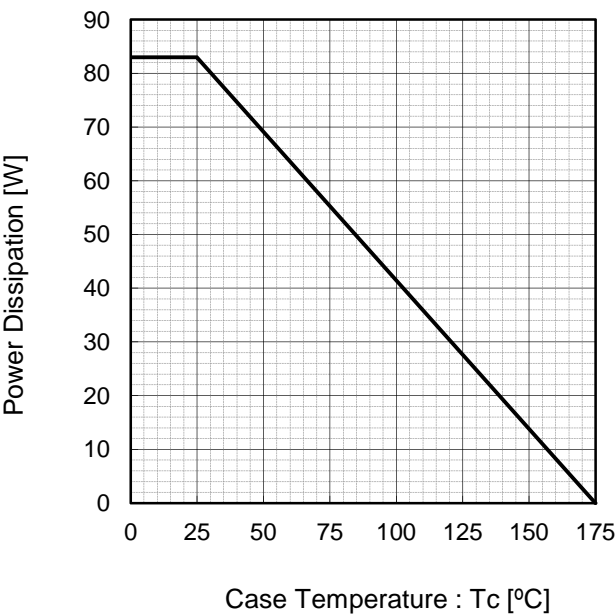


Fig.7 Derating Curve  $I_p$ - $T_c$  (Per leg)

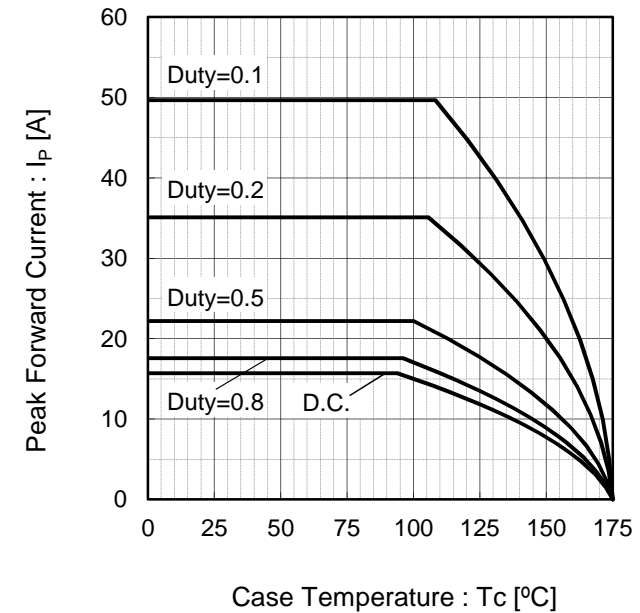
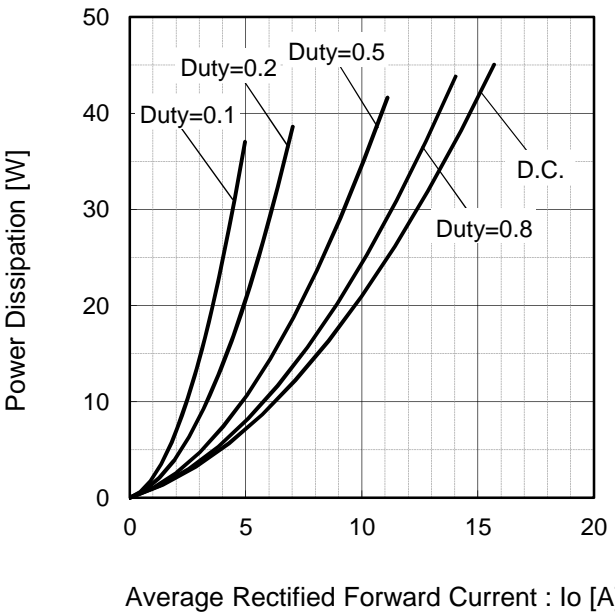


Fig.8  $I_o$ - $P_f$  Characteristics (Per leg)



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