

$V_R$	650V
$I_F$	20A
$Q_C$	31nC

### ●Features

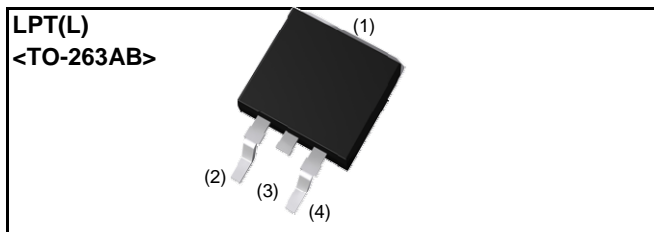
- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible

### ●Construction

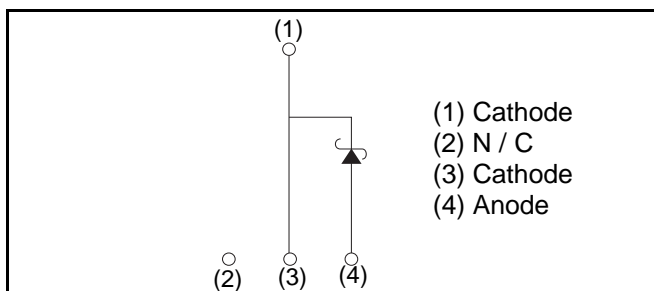
Silicon carbide epitaxial planer type

### ●AEC-Q101 Qualified outline

#### ●Outline



### ●Inner circuit



### ●Packaging specifications

Type	Packaging	Embossed tape
	Reel size (mm)	330
	Tape width (mm)	24
	Basic ordering unit (pcs)	1,000
	Packing code	TLL
	Marking	SCS220AJ

### ●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	$I_F$	20 <sup>*1</sup>	A
Surge no repetitive forward current	$I_{FSM}$	71 <sup>*2</sup>	A
		260 <sup>*3</sup>	A
		56 <sup>*4</sup>	A
Repetitive peak forward current	$I_{FRM}$	67 <sup>*5</sup>	A
Total power dissipation	$P_D$	100 <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  $T_c=110^\circ\text{C}$  \*2 PW=8.3ms sinusoidal,  $T_j=25^\circ\text{C}$  \*3 PW=10μs square,  $T_j=25^\circ\text{C}$

\*4 PW=8.3ms sinusoidal,  $T_j=150^\circ\text{C}$  \*5  $T_c=100^\circ\text{C}$ ,  $T_j=150^\circ\text{C}$ , Duty cycle=10% \*6  $T_c=25^\circ\text{C}$

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{DC}$	$I_R = 0.4\text{mA}$	600	-	-	V
Forward voltage	$V_F$	$I_F = 20\text{A}, T_j = 25^\circ\text{C}$	-	1.35	1.55	V
		$I_F = 20\text{A}, T_j = 150^\circ\text{C}$	-	1.55	-	V
		$I_F = 20\text{A}, T_j = 175^\circ\text{C}$	-	1.63	-	V
Reverse current	$I_R$	$V_R = 600\text{V}, T_j = 25^\circ\text{C}$	-	4	400	$\mu\text{A}$
		$V_R = 600\text{V}, T_j = 150^\circ\text{C}$	-	60	-	$\mu\text{A}$
		$V_R = 600\text{V}, T_j = 175^\circ\text{C}$	-	140	-	$\mu\text{A}$
Total capacitance	$C_t$	$V_R = 1\text{V}, f = 1\text{MHz}$	-	730	-	pF
		$V_R = 600\text{V}, f = 1\text{MHz}$	-	74	-	pF
Total capacitive charge	$Q_c$	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	31	-	nC
Switching time	$t_c$	$V_R = 400\text{V}, di/dt = 350\text{A}/\mu\text{s}$	-	19	-	ns

**●Thermal characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	-	-	1.1	1.4	$^\circ\text{C}/\text{W}$

●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

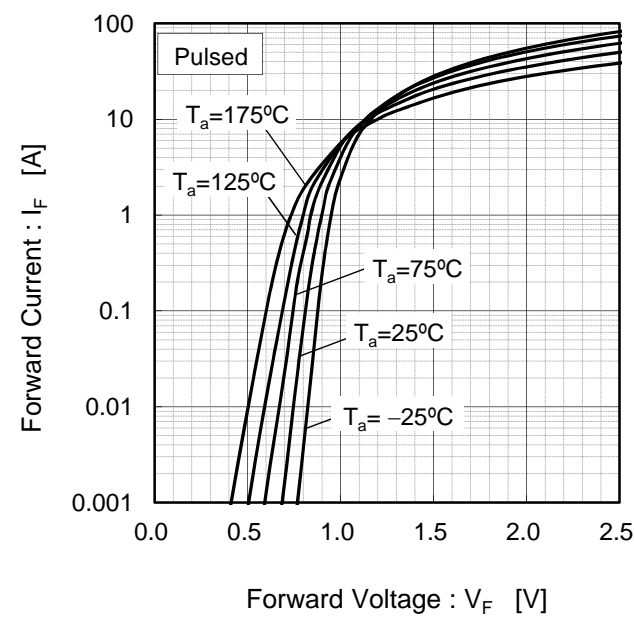


Fig.2  $V_F - I_F$  Characteristics

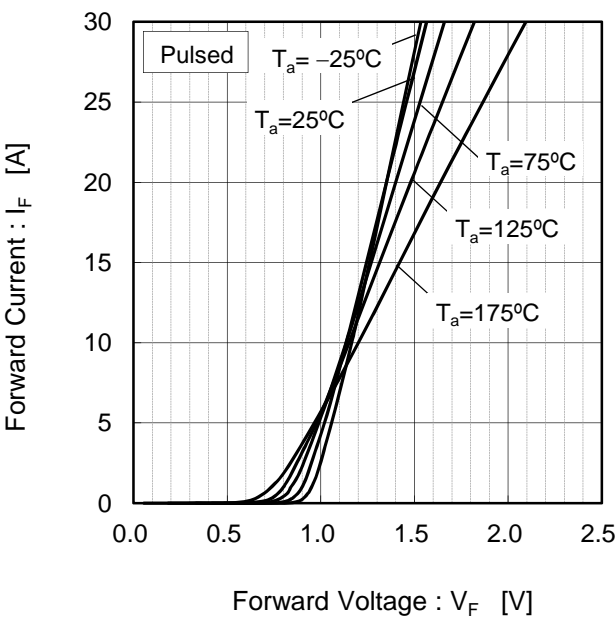


Fig.3  $V_R - I_R$  Characteristics

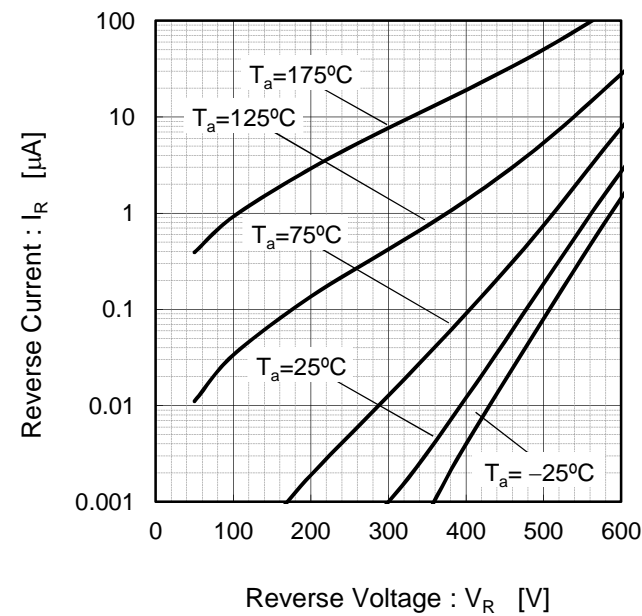
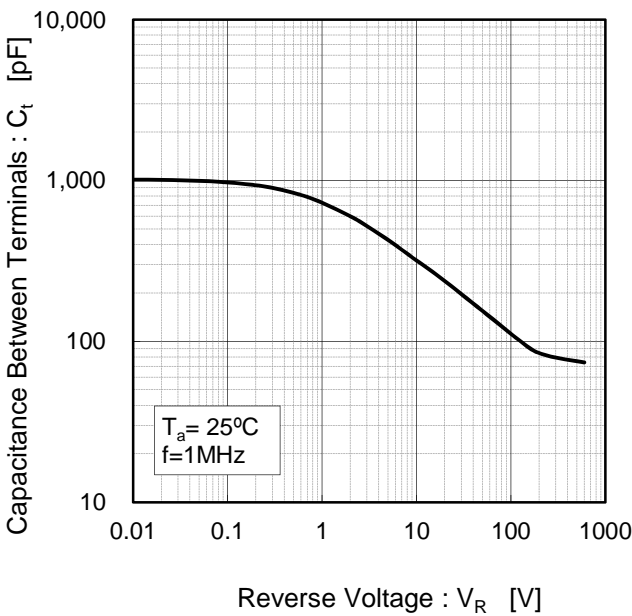


Fig.4  $V_R - C_t$  Characteristics



●Electrical characteristic curves

Fig.5 Thermal Resistance vs. Pulse Width

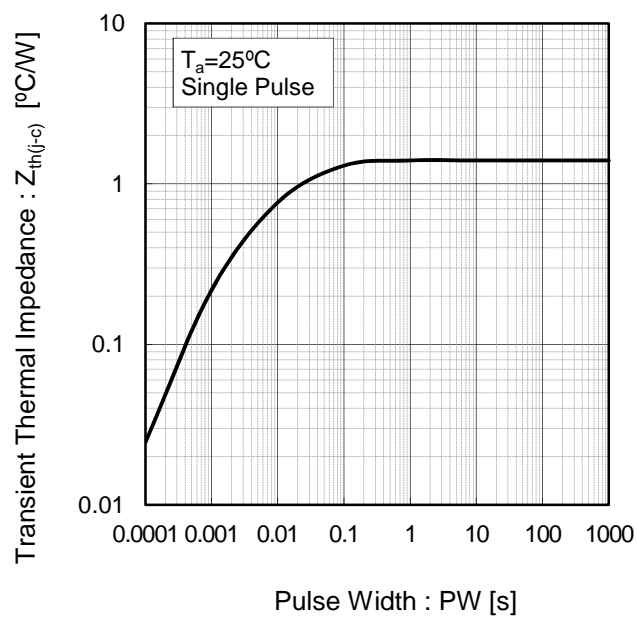


Fig.6 Power Dissipation

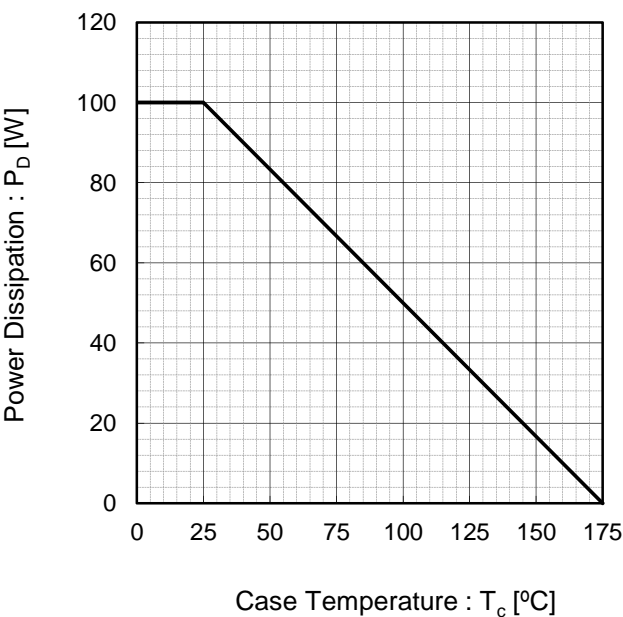


Fig.7  $I_P$ - $T_c$  Derating Curve

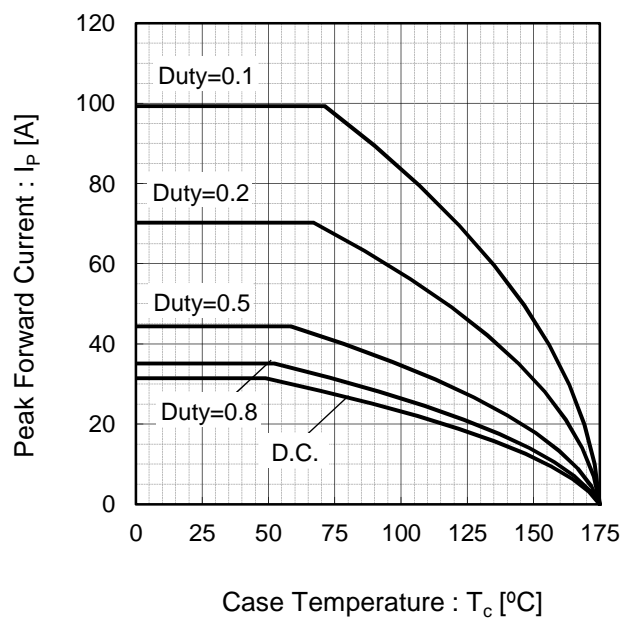
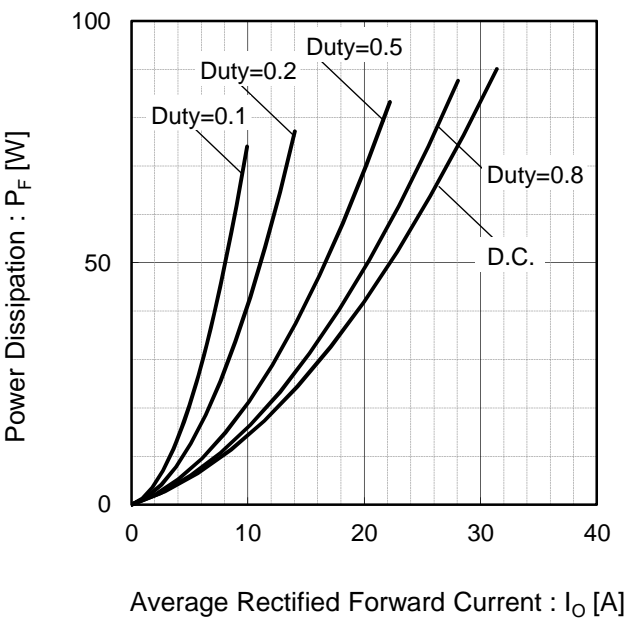


Fig.8  $I_O$ - $P_F$  Characteristics



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