

$V_R$	1200V
$I_F$	5 / 10A*
$Q_C$	11nC(Per leg)

(\*Per leg/Both legs)

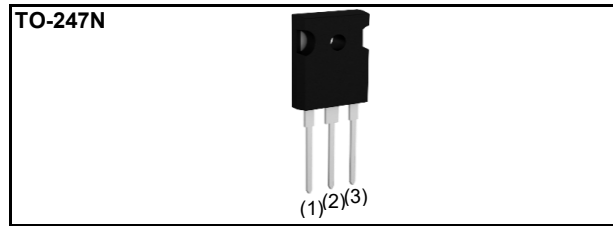
#### ●Features

- 1) AEC-Q101 qualified
- 2) High surge current capability
- 3) Low leakage current
- 4) Reduced temperature dependence
- 5) High-speed switching possible

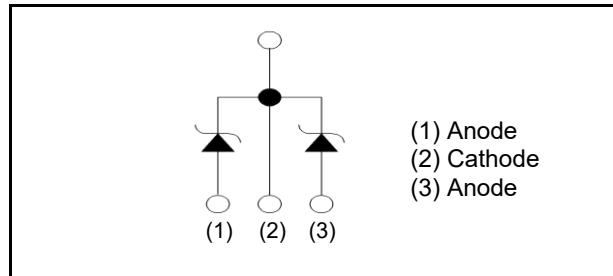
#### ●Applications

- On Board Charger
- DC/DC Converter
- Wireless Charger
- EV Charger Station

#### ●Outline



#### ●Inner circuit



#### ●Packaging specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	30
	Packing code	C11
	Marking	SCS310KE2

#### ●Absolute maximum ratings ( $T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit	
Reverse voltage (repetitive peak)	$V_{RM}$	1200	V	
Reverse voltage (DC)	$V_R$	1200	V	
Continuous forward current <sup>*4</sup> ( $T_c=149^{\circ}\text{C}$ )	$I_F$	5 / 10 <sup>*1</sup>	A	
Surge non-repetitive forward current <sup>*4</sup>	$I_{FSM}$	PW=10ms sinusoidal, $T_{vj}=25^{\circ}\text{C}$	56 / 112	A
		PW=10ms sinusoidal, $T_{vj}=150^{\circ}\text{C}$	42 / 84	A
		PW=10ms square, $T_{vj}=25^{\circ}\text{C}$	220 / 440	A
Repetitive peak forward current <sup>*4</sup>	$I_{FRM}$	26 / 52 <sup>*2</sup>	A	
$i^2t$ value <sup>*4</sup>	$\int i^2 dt$	$1 \leq PW \leq 10\text{ms}$ , $T_{vj}=25^{\circ}\text{C}$	15 / 60	$\text{A}^2\text{s}$
		$1 \leq PW \leq 10\text{ms}$ , $T_{vj}=150^{\circ}\text{C}$	8 / 32	$\text{A}^2\text{s}$
Total power dissipation <sup>*4</sup>	$P_D$	75 / 150 <sup>*3</sup>	W	
Virtual junction temperature	$T_{vj}$	175	$^{\circ}\text{C}$	
Range of storage temperature	$T_{stg}$	-40 to +175	$^{\circ}\text{C}$	

\*1 Limited by maximum  $T_{vj}$  and for Max.  $R_{thJC}$ . \*2  $T_c=100^{\circ}\text{C}$ ,  $T_{vj}=150^{\circ}\text{C}$ , Duty cycle=10% \*3  $T_c=25^{\circ}\text{C}$

\*4 Per leg/Both legs

●Electrical characteristics (T<sub>vj</sub>=25°C unless otherwise specified) (Per Leg)

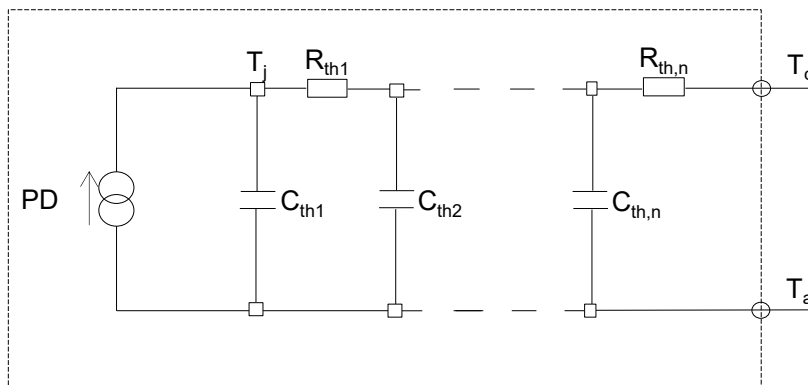
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V <sub>DC</sub>	I <sub>R</sub> = 40μA	1200	-	-	V
Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 5A, T <sub>vj</sub> = 25°C	-	1.4	1.6	V
		I <sub>F</sub> = 5A, T <sub>vj</sub> = 150°C	-	1.8	-	V
		I <sub>F</sub> = 5A, T <sub>vj</sub> = 175°C	-	2.0	-	V
Reverse current	I <sub>R</sub>	V <sub>R</sub> = 1200V, T <sub>vj</sub> = 25°C	-	0.05	20	μA
		V <sub>R</sub> = 1200V, T <sub>vj</sub> = 150°C	-	3.5	50	μA
		V <sub>R</sub> = 1200V, T <sub>vj</sub> = 175°C	-	10	-	μA
Total capacitance	C	V <sub>R</sub> = 1V, f = 1MHz	-	260	-	pF
		V <sub>R</sub> = 800V, f = 1MHz	-	18	-	pF
Total capacitive charge	Q <sub>C</sub>	V <sub>R</sub> = 800V, di/dt = 500A/μs	-	11	-	nC
Switching time	t <sub>C</sub>	V <sub>R</sub> = 800V, di/dt = 500A/μs	-	10	-	ns

●Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	R <sub>thJC</sub>	Per Leg	-	1.5	2.0	K/W
		Both Legs	-	0.82	1.1	K/W

●Typical Transient Thermal Characteristics (Per Leg)

Symbol	Value	Unit	Symbol	Value	Unit
R <sub>th1</sub>	9.2 × 10 <sup>-1</sup>	K/W	C <sub>th1</sub>	1.2 × 10 <sup>-3</sup>	Ws/K
R <sub>th2</sub>	5.0 × 10 <sup>-1</sup>		C <sub>th2</sub>	6.6 × 10 <sup>-3</sup>	
R <sub>th3</sub>	8.5 × 10 <sup>-2</sup>		C <sub>th3</sub>	3.8 × 10 <sup>-2</sup>	



●Electrical characteristic curves (Per Leg)

Fig.1  $V_F - I_F$  Characteristics

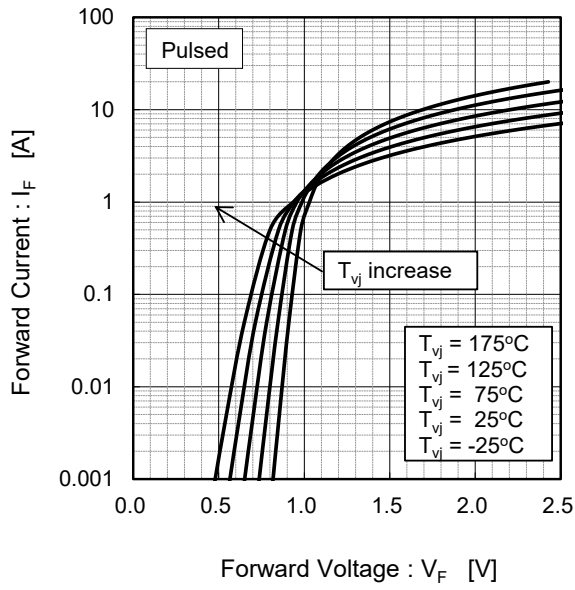


Fig.2  $V_F - I_F$  Characteristics

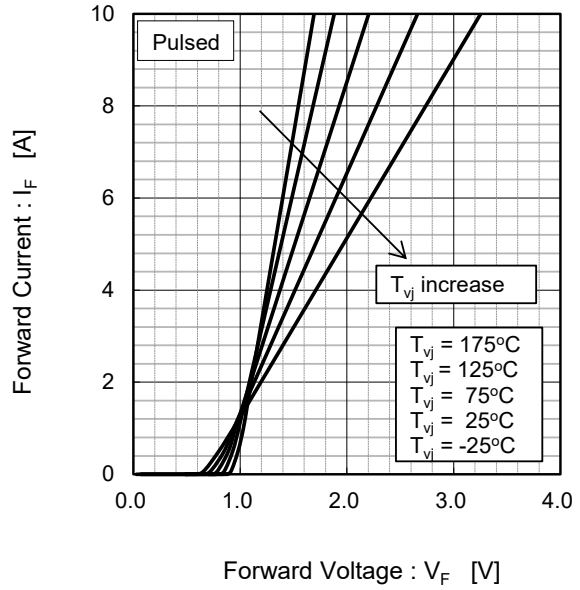


Fig.3  $V_R - I_R$  Characteristics

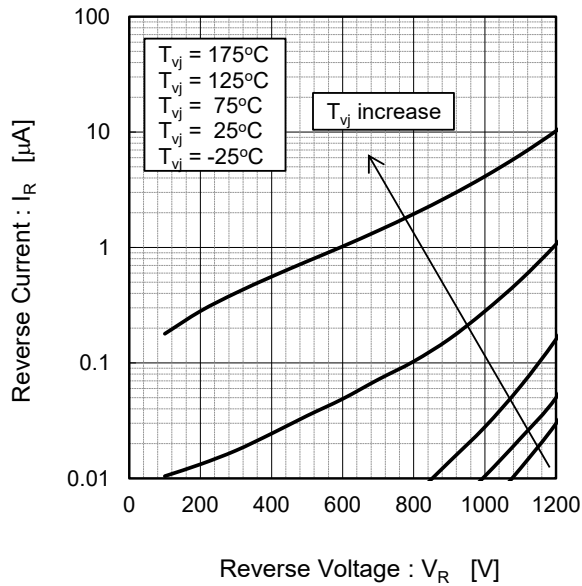
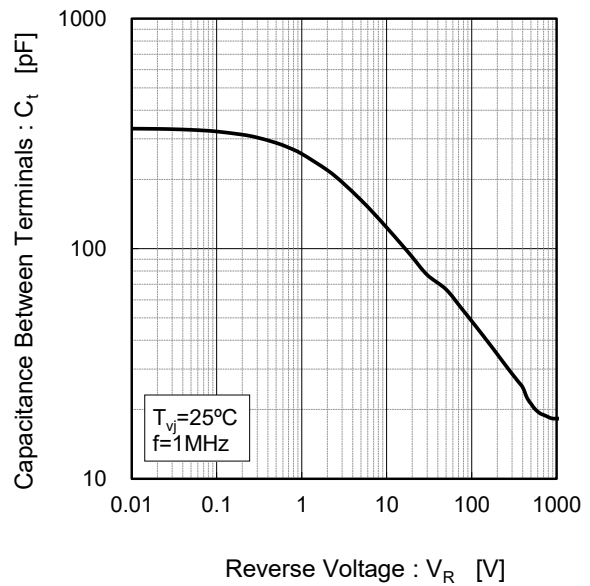


Fig.4  $V_R - C_t$  Characteristics



●Electrical characteristic curves (Per Leg)

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

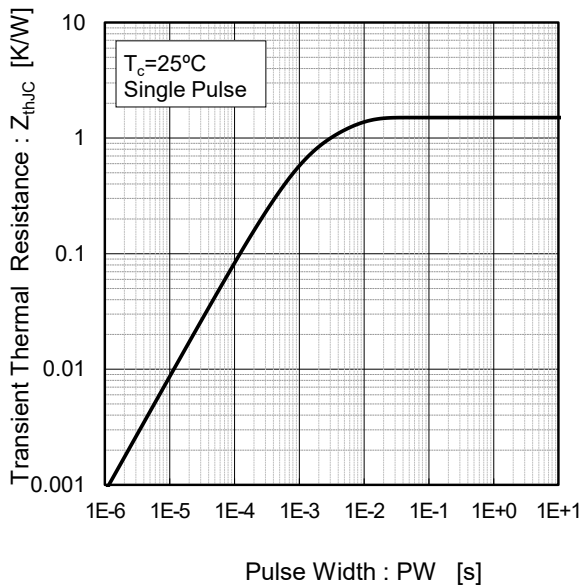


Fig.6 Power Dissipation

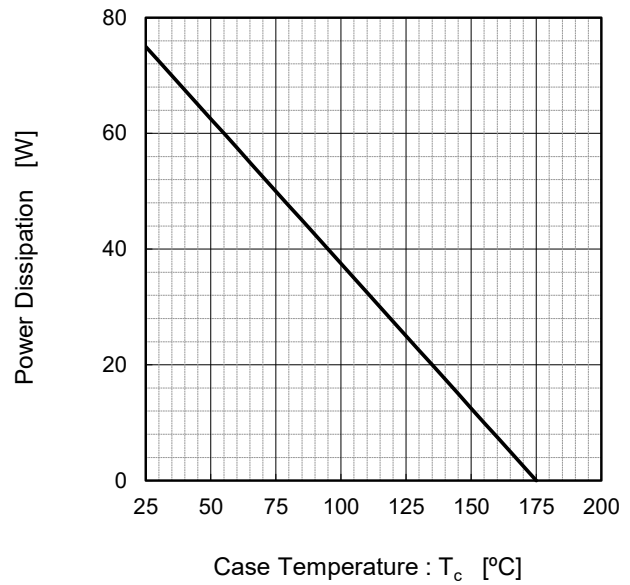
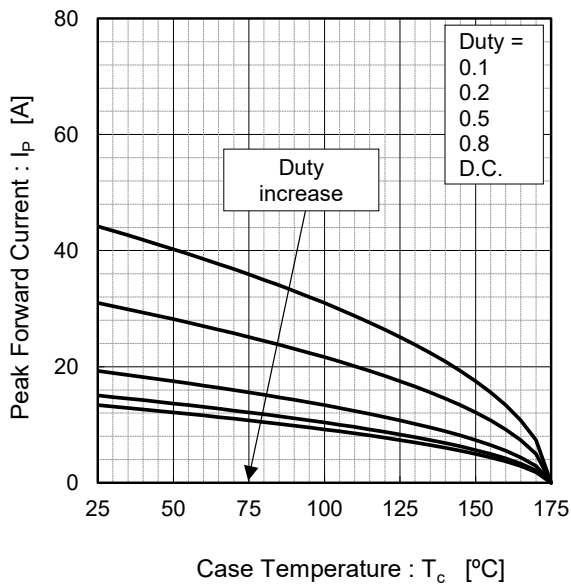
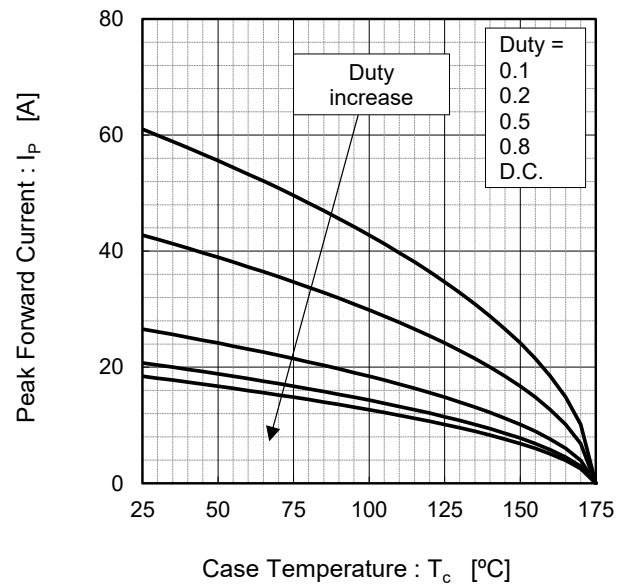


Fig.7\*4 Maximum peak forward current derating curve  $I_p - T_c$



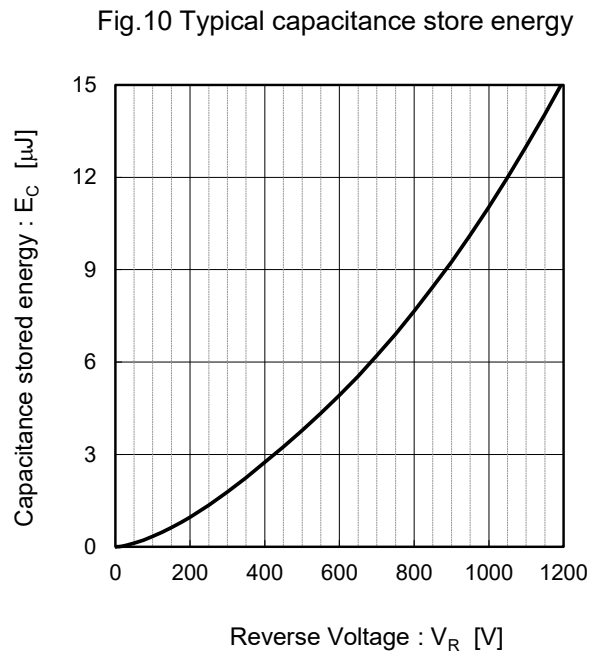
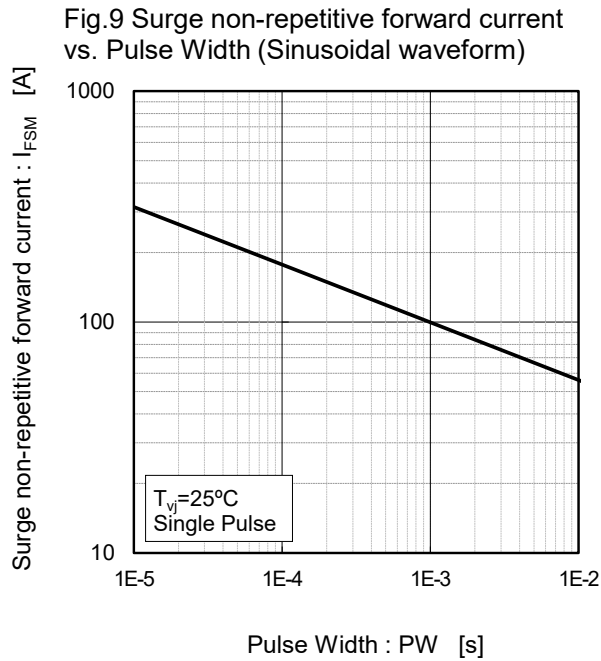
\*4 Based on max Vf, max  $R_{thJC}$   
Valid for switching of above 10kHz,  
excluding D.C. curve.

Fig.8\*5 Typical peak forward current derating curve  $I_p - T_c$  (Not guaranteed)



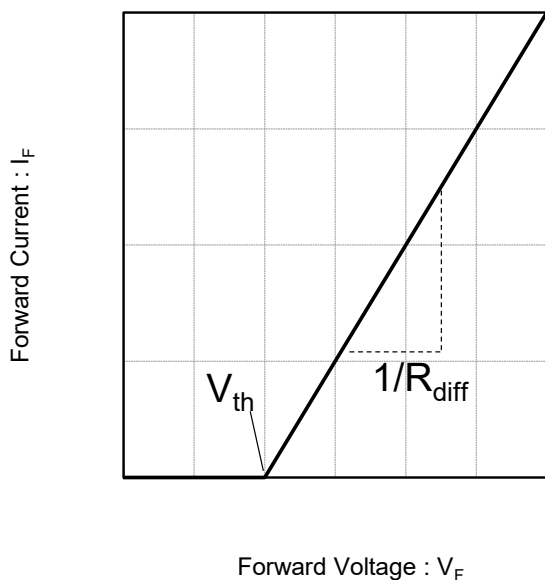
\*5 Based on typ Vf, typ  $R_{thJC}$   
Typical value, not guaranteed  
Valid for switching of above 10kHz,  
excluding D.C. curve

●Electrical characteristic curves (Per Leg)



●Simplified forward characteristic model (Per Leg)

Fig.11 Equivalent forward current curve



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

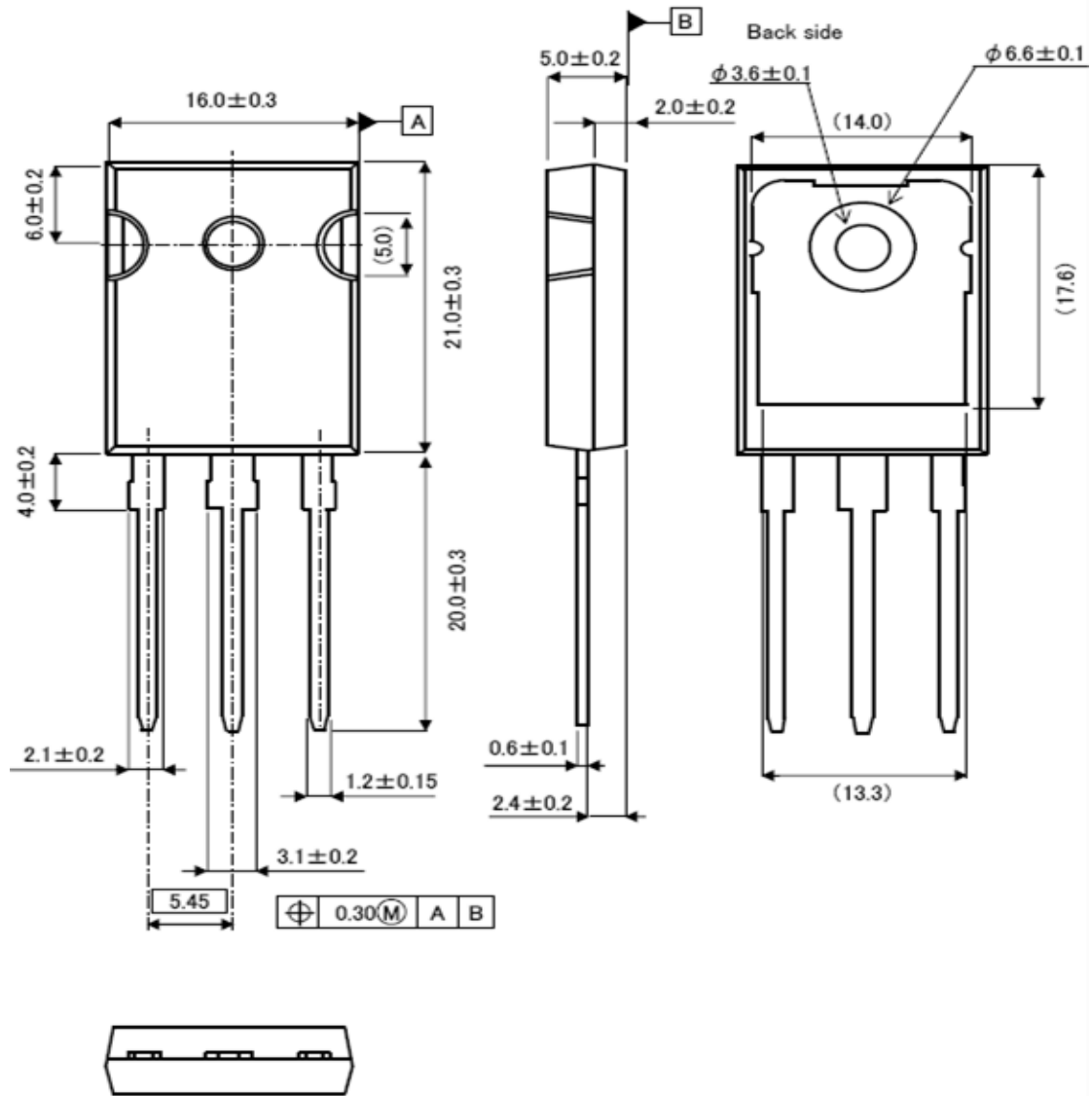
$$V_{th} ( T_{vj} ) = a_0 + a_1 T_{vj}$$

$$R_{diff} ( T_{vj} ) = b_0 + b_1 T_{vj} + b_2 T_{vj}^2$$

Symbol	Typical Value	Unit
a <sub>0</sub>	0.922	V
a <sub>1</sub>	-1.388	mV/°C
b <sub>0</sub>	84.80	mΩ
b <sub>1</sub>	0.517	mΩ/°C
b <sub>2</sub>	2.682	μΩ/°C <sup>2</sup>

T<sub>vj</sub> in °C; -55 °C < T<sub>vj</sub> < 175°C ; I<sub>F</sub> < 10 A

## ●Package Dimensions



•Dimensions do not include mold flash, protrusion or gate burrs.

Unit: mm

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