

$V_R$	1200V
$I_F$	10A
$Q_C$	36nC

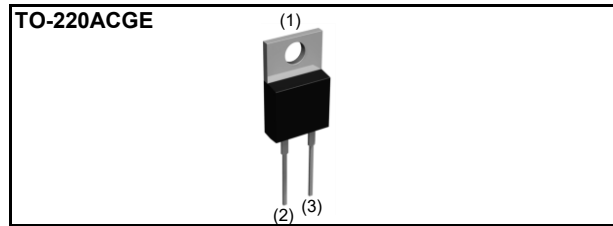
#### ●Features

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

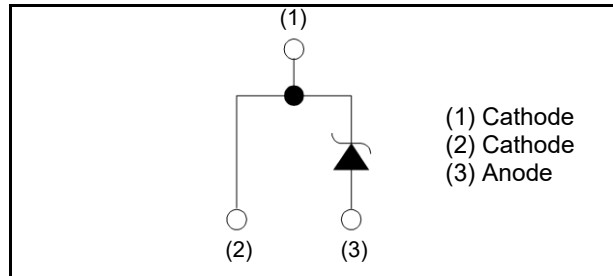
#### ●Applications

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

#### ●Outline



#### ●Inner circuit



#### ●Packaging specifications

Type	Packaging	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	50
	Packing code	C16
	Marking	SCS310KG

#### ●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 ( $T_c=144^{\circ}\text{C}$ )	$I_F$	10 <sup>*1</sup>	A	
Surge non-repetitive forward current	$I_{FSM}$	PW=10ms sinusoidal, $T_{vj}=25^{\circ}\text{C}$	100	A
		PW=10ms sinusoidal, $T_{vj}=150^{\circ}\text{C}$	75	A
		PW=10 $\mu\text{s}$ square, $T_{vj}=25^{\circ}\text{C}$	390	A
Repetitive peak forward current	$I_{FRM}$	48 <sup>*2</sup>	A	
$i^2t$ value	$\int i^2 dt$	$1 \leq PW \leq 10\text{ms}$ , $T_{vj}=25^{\circ}\text{C}$	50	$\text{A}^2\text{s}$
		$1 \leq PW \leq 10\text{ms}$ , $T_{vj}=150^{\circ}\text{C}$	28	$\text{A}^2\text{s}$
Total power dissipation	$P_D$	125 <sup>*3</sup>	W	
Virtual junction temperature	$T_{vj}$	175	$^{\circ}\text{C}$	
Range of storage temperature	$T_{stg}$	-55 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  $T_c=25^{\circ}\text{C}$

**●Electrical characteristics** ( $T_{vj}=25^{\circ}\text{C}$  unless otherwise specified)

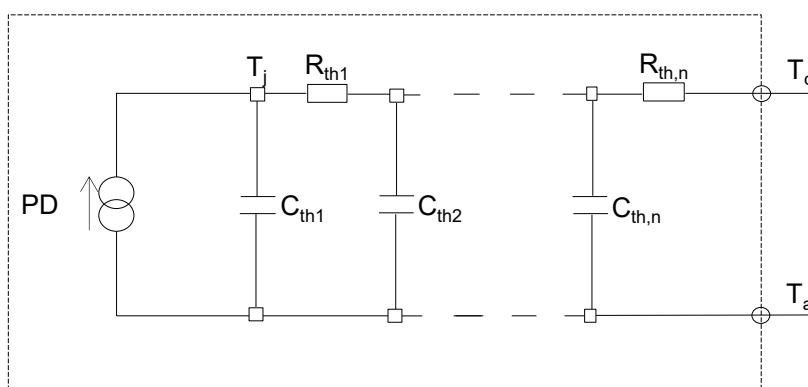
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{DC}$	$I_R = 40\mu\text{A}$	1200	-	-	V
Forward voltage	$V_F$	$I_F = 10\text{A}$ $T_{vj} = 25^{\circ}\text{C}$	-	1.4	1.6	V
		$I_F = 10\text{A}$ $T_{vj} = 150^{\circ}\text{C}$	-	1.8	-	V
		$I_F = 10\text{A}$ $T_{vj} = 175^{\circ}\text{C}$	-	2.0	-	V
Reverse current	$I_R$	$V_R = 1200\text{V}$ , $T_{vj} = 25^{\circ}\text{C}$	-	0.1	40	$\mu\text{A}$
		$V_R = 1200\text{V}$ , $T_{vj} = 150^{\circ}\text{C}$	-	7	100	$\mu\text{A}$
		$V_R = 1200\text{V}$ , $T_{vj} = 175^{\circ}\text{C}$	-	20	-	$\mu\text{A}$
Total capacitance	C	$V_R = 1\text{V}$ , $f = 1\text{MHz}$	-	520	-	pF
		$V_R = 800\text{V}$ , $f = 1\text{MHz}$	-	37	-	pF
Total capacitive charge	$Q_C$	$V_R = 800\text{V}$ , $di/dt = 500\text{A}/\mu\text{s}$	-	36	-	nC
Switching time	$t_C$	$V_R = 800\text{V}$ , $di/dt = 500\text{A}/\mu\text{s}$	-	17	-	ns

**●Thermal characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{thJC}$	-	-	0.84	1.2	K/W

**●Typical Transient Thermal Characteristics**

Symbol	Value	Unit	Symbol	Value	Unit
$R_{th1}$	$5.4 \times 10^{-1}$	K/W	$C_{th1}$	$2.9 \times 10^{-3}$	Ws/K
$R_{th2}$	$2.8 \times 10^{-1}$		$C_{th2}$	$2.4 \times 10^{-2}$	
$R_{th3}$	$2.3 \times 10^{-2}$		$C_{th3}$	$6.7 \times 10^{-2}$	



●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

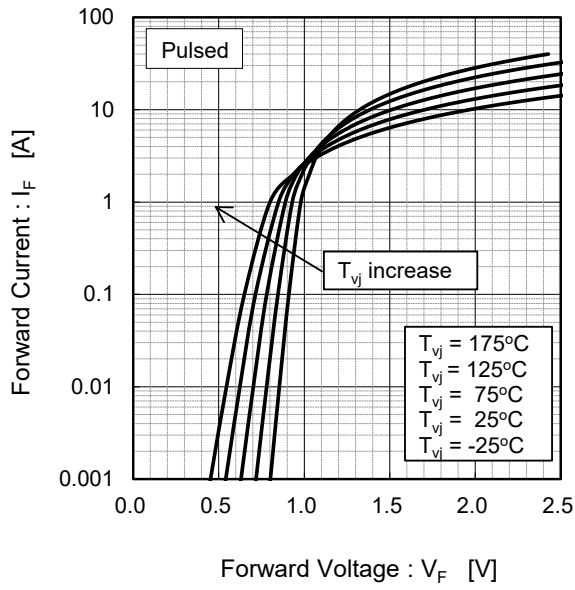


Fig.2  $V_F - I_F$  Characteristics

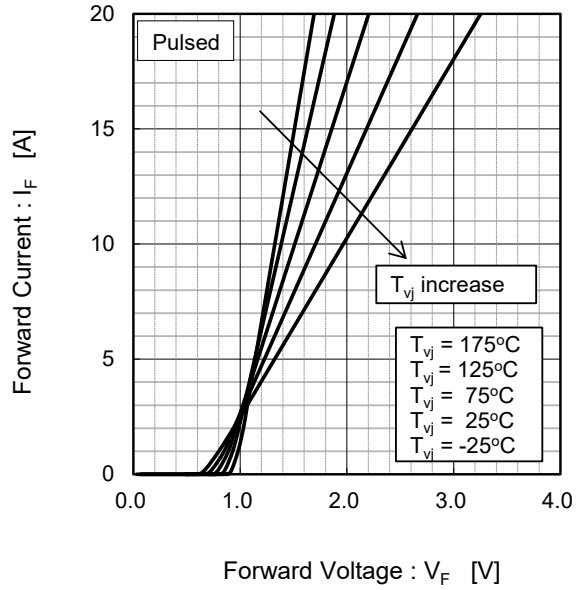


Fig.3  $V_R - I_R$  Characteristics

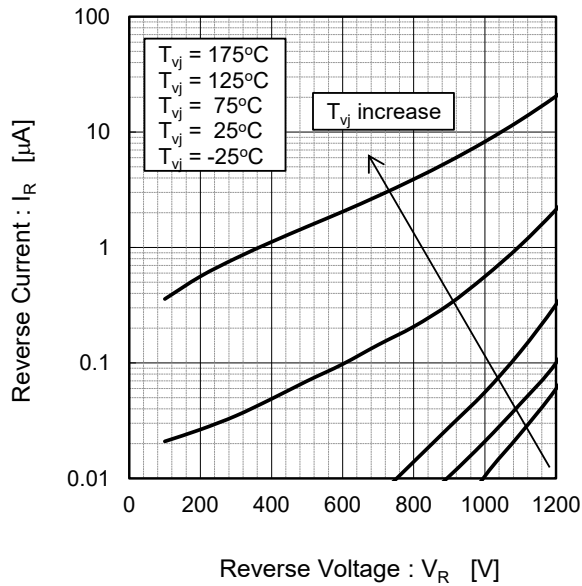
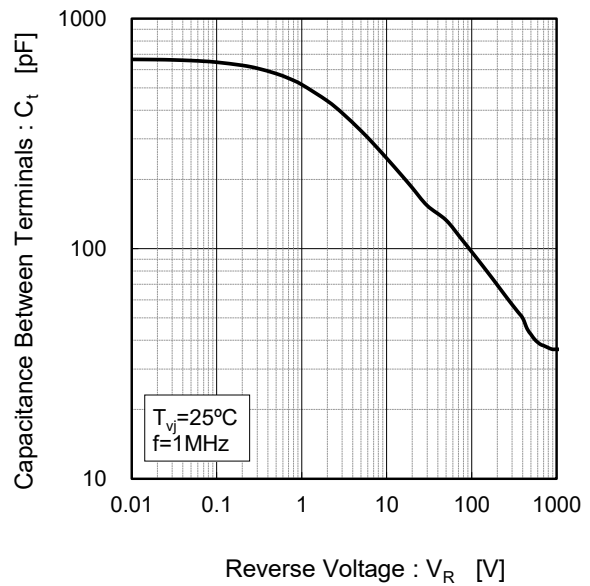


Fig.4  $V_R - C_t$  Characteristics



●Electrical characteristic curves

Fig.5 Typical Transient Thermal Resistance vs. Pulse Width

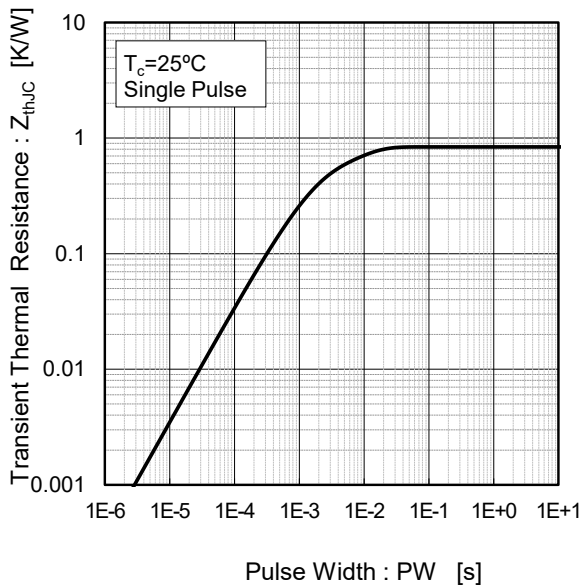


Fig.6 Power Dissipation

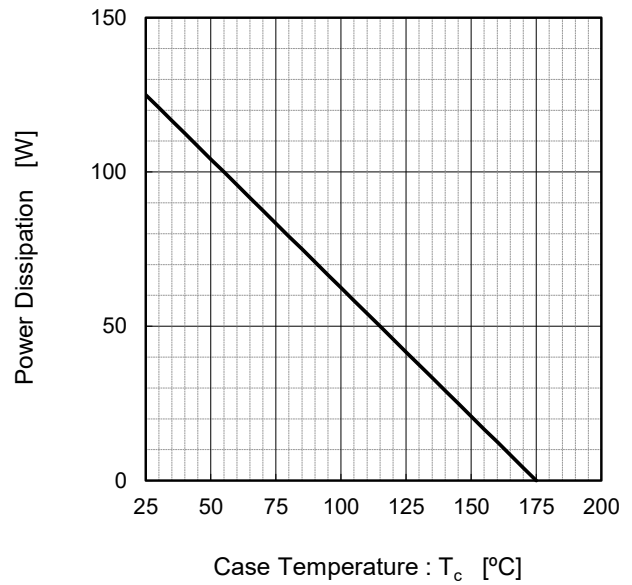
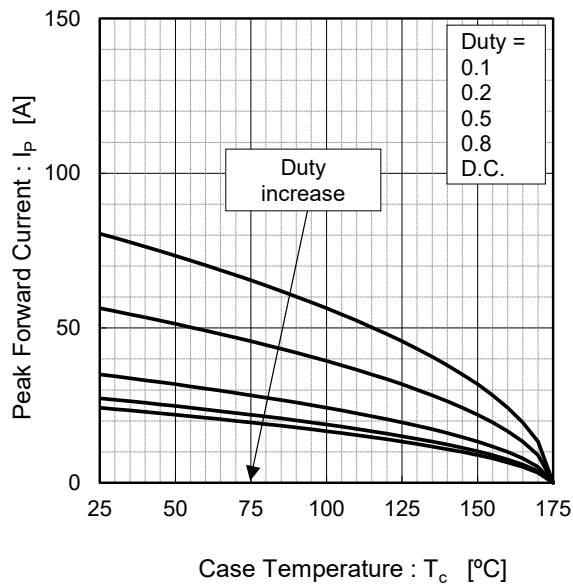
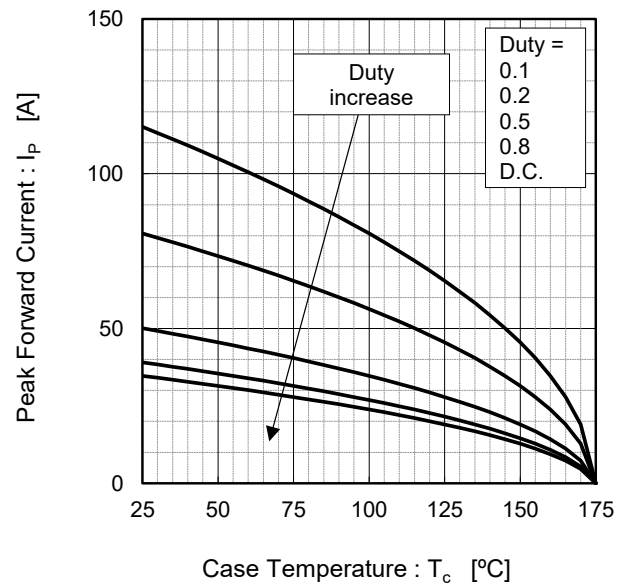


Fig.7\*4 Maximum peak forward current derating curve  $I_p - T_c$



\*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

Fig.9 Surge non-repetitive forward current vs. Pulse Width (Sinusoidal waveform)

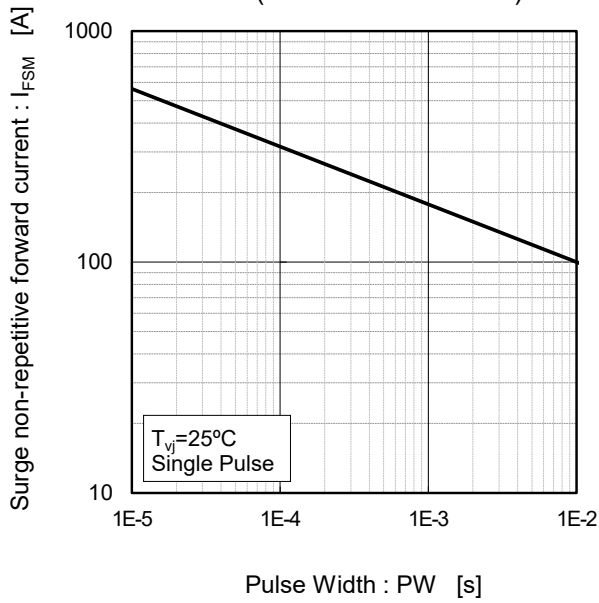
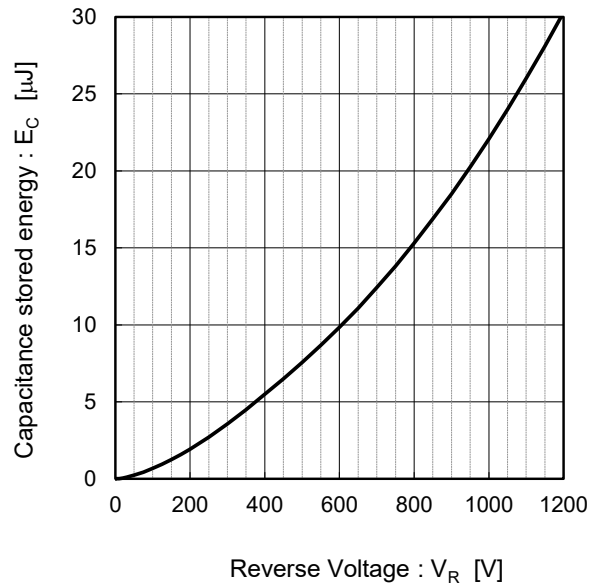
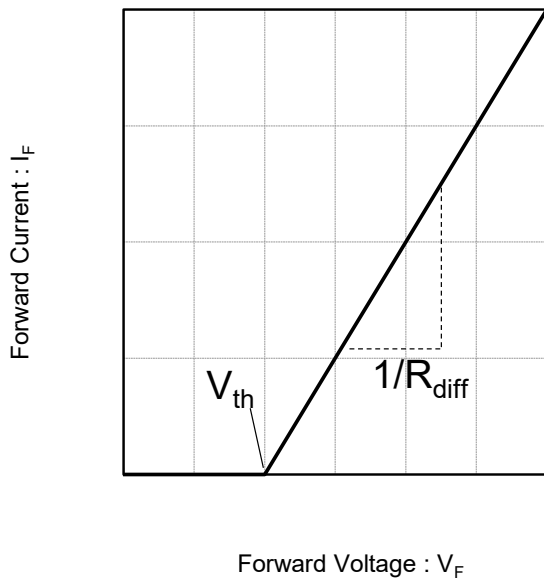


Fig.10 Typical capacitance store energy



●Simplified forward characteristic model

Fig.11 Equivalent forward current curve



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

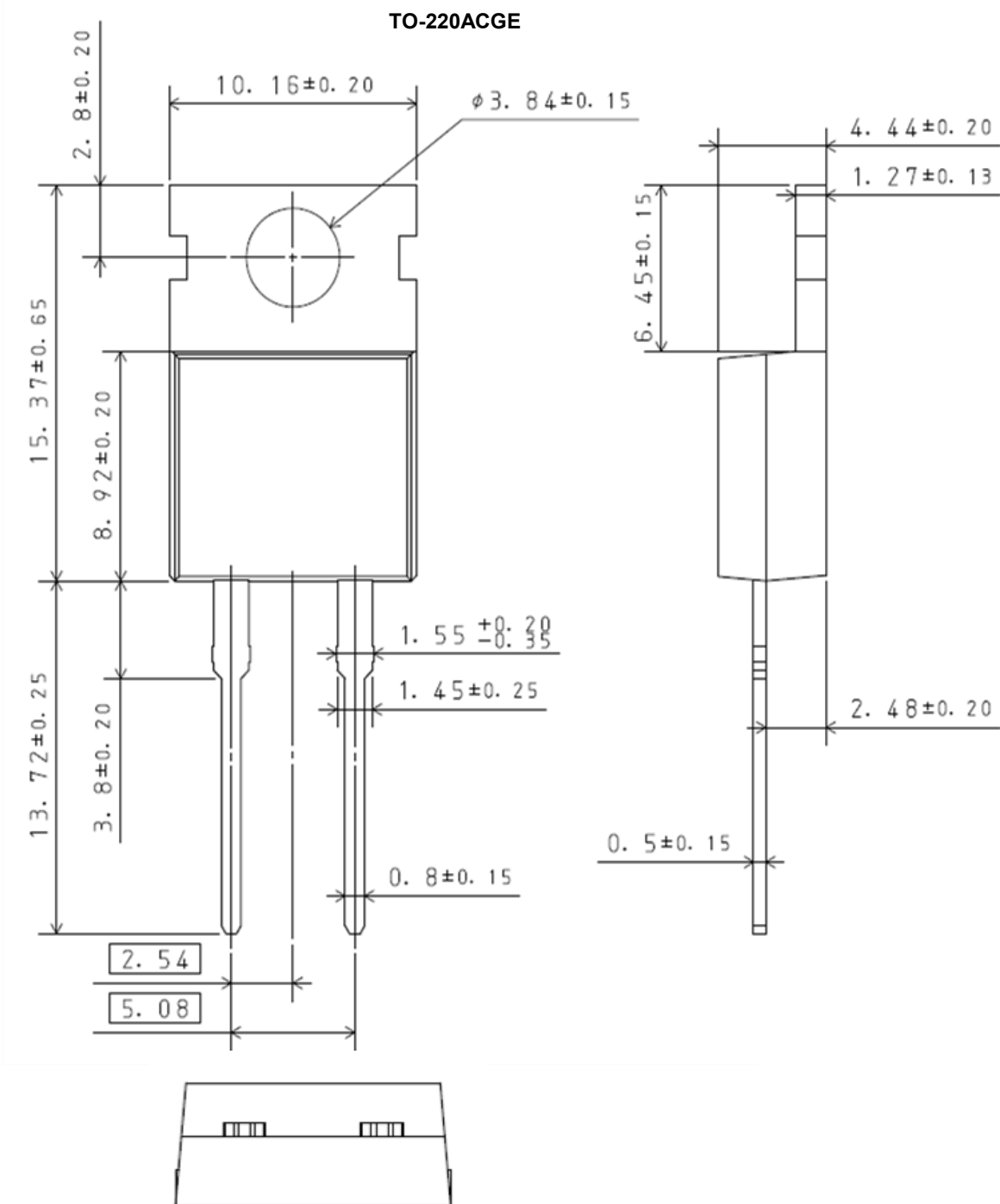
$$V_{th}(T_{vj}) = a_0 + a_1 T_{vj}$$

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

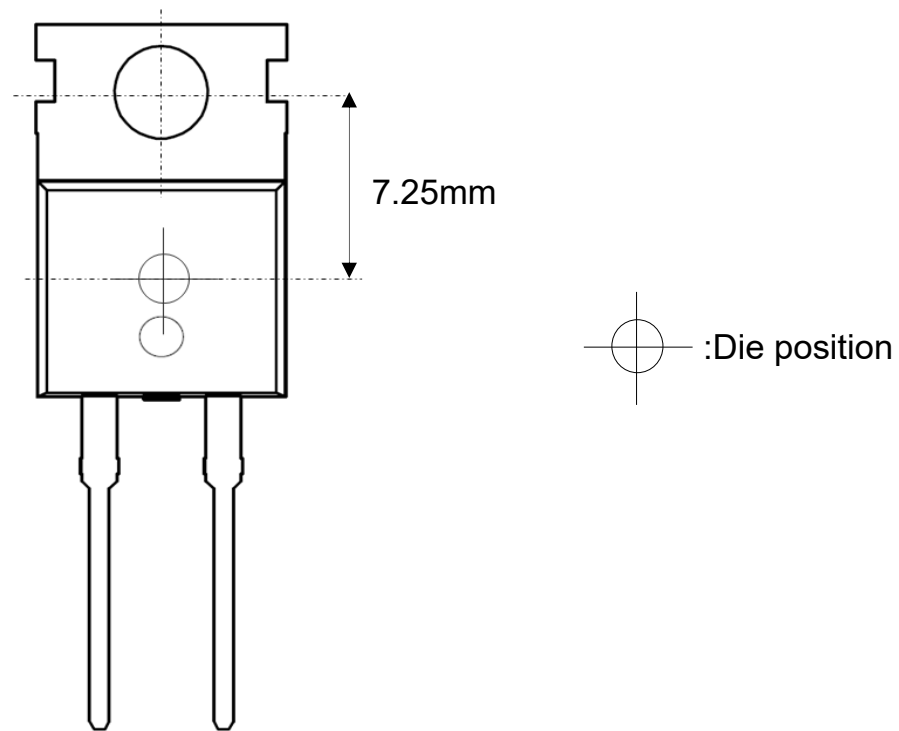
Symbol	Typical Value	Unit
a <sub>0</sub>	0.922	V
a <sub>1</sub>	-1.388	mV/°C
b <sub>0</sub>	42.40	mΩ
b <sub>1</sub>	0.259	mΩ/°C
b <sub>2</sub>	1.341	μΩ/°C <sup>2</sup>

T<sub>vj</sub> in °C; -55 °C < T<sub>vj</sub> < 175°C ; I<sub>F</sub> < 20 A

●Dimensions\* (Unit : mm) \*Dimensions do not include mold flash, protrusion or gate burrs.



## ●Die Bonding Layout



- Front view of the packaging.
- Dimensions are design values.
- If the heat sink is to be installed, it should be in contact with the die bonding point.

Unit: mm

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