

$V_R$	1200V
$I_F$	5A
$Q_C$	12nC

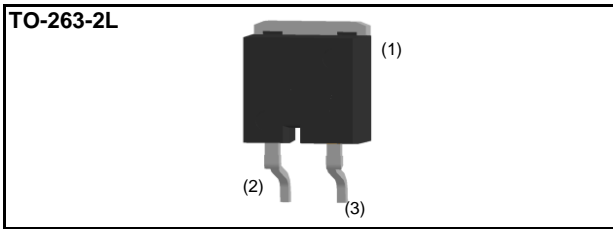
#### ●Features

- 1) Low forward voltage
- 2) Negligible recovery time/current
- 3) Temperature independent switching behavior
- 4) Wide creepage distance = min. 5.10mm

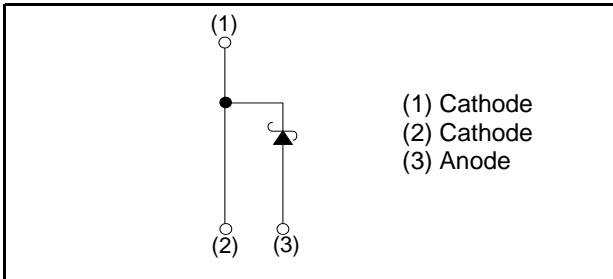
#### ●Applications

- Factory Automation
- PV Power Conditioner
- Wireless Charger
- EV Charger Station

#### ●Outline



#### ●Inner circuit



#### ●Packaging specifications

Type	Packaging	Embossed tape
	Reel size (mm)	330
	Tape width (mm)	24
	Basic ordering unit (pcs)	1000
	Packing code	TRL
	Marking	SCS205KN

#### ●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 ( $T_c = 148^\circ\text{C}$ )	$I_F$	5 <sup>*1</sup>	A
Surge non-repetitive forward current	$I_{FSM}$	PW = 10ms sinusoidal, $T_{vj} = 25^\circ\text{C}$	23 A
		PW = 10ms sinusoidal, $T_{vj} = 150^\circ\text{C}$	17 A
		PW = 10 $\mu\text{s}$ square, $T_{vj} = 25^\circ\text{C}$	80 A
Repetitive peak forward current	$I_{FRM}$	26 <sup>*2</sup>	A
$i^2t$ value	$\int i^2 dt$	PW = 10ms, $T_{vj} = 25^\circ\text{C}$	2.5 $\text{A}^2\text{s}$
		PW = 10ms, $T_{vj} = 150^\circ\text{C}$	1.4 $\text{A}^2\text{s}$
Total power dissipation	$P_D$	83 <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  $T_c = 25^\circ\text{C}$

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

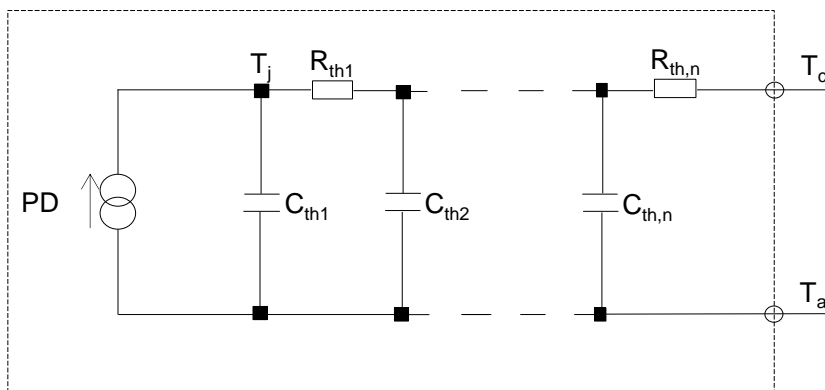
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	$V_{DC}$	$I_R = 0.1\text{mA}$	1200	-	-	V
Forward voltage	$V_F$	$I_F = 5\text{A}, T_{vj} = 25^{\circ}\text{C}$	-	1.4	1.6	V
		$I_F = 5\text{A}, T_{vj} = 150^{\circ}\text{C}$	-	1.8	-	V
		$I_F = 5\text{A}, T_{vj} = 175^{\circ}\text{C}$	-	1.9	-	V
Reverse current	$I_R$	$V_R = 1200\text{V}, T_{vj} = 25^{\circ}\text{C}$	-	2.5	100	$\mu\text{A}$
		$V_R = 1200\text{V}, T_{vj} = 150^{\circ}\text{C}$	-	40	-	$\mu\text{A}$
		$V_R = 1200\text{V}, T_{vj} = 175^{\circ}\text{C}$	-	65	-	$\mu\text{A}$
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$	-	260	-	pF
		$V_R = 800\text{V}, f = 1\text{MHz}$	-	21	-	pF
Total capacitive charge	$Q_C$	$V_R = 800\text{V}, di/dt = 500\text{A}/\mu\text{s}$	-	12	-	nC
Switching time	$t_c$	$V_R = 800\text{V}, di/dt = 500\text{A}/\mu\text{s}$	-	10	-	ns

●Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{thJC}$	-	-	1.3	1.8	K/W

●Typical Transient Thermal Characteristics

Symbol	Value	Unit	Symbol	Value	Unit
$R_{th1}$	$4.32 \times 10^{-1}$	K/W	$C_{th1}$	$4.38 \times 10^{-4}$	Ws/K
$R_{th2}$	$8.83 \times 10^{-1}$		$C_{th2}$	$1.52 \times 10^{-3}$	
$R_{th3}$	$3.74 \times 10^{-5}$		$C_{th3}$	$3.83 \times 10^0$	



●Electrical characteristic curves

Fig.1  $V_F - I_F$  Characteristics

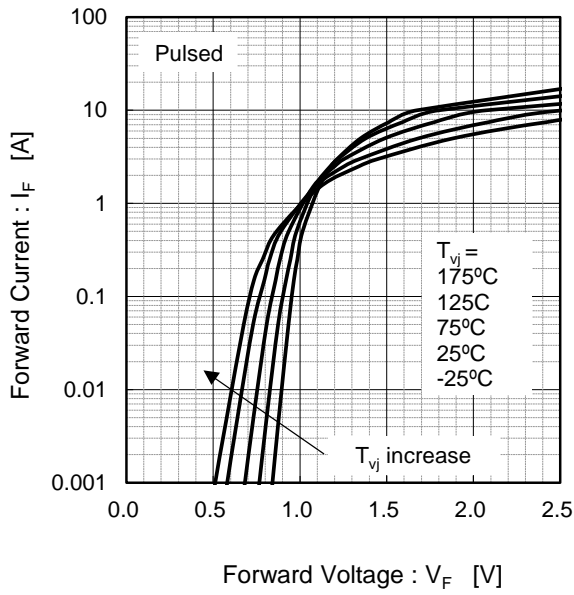


Fig.2  $V_F - I_F$  Characteristics

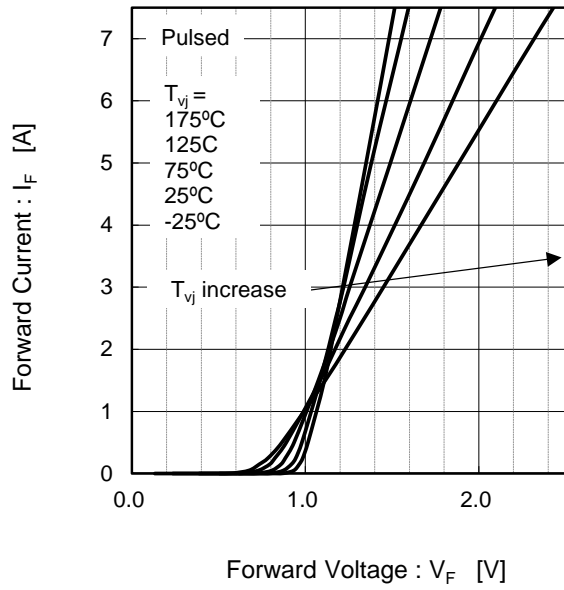


Fig.3  $V_R - I_R$  Characteristics

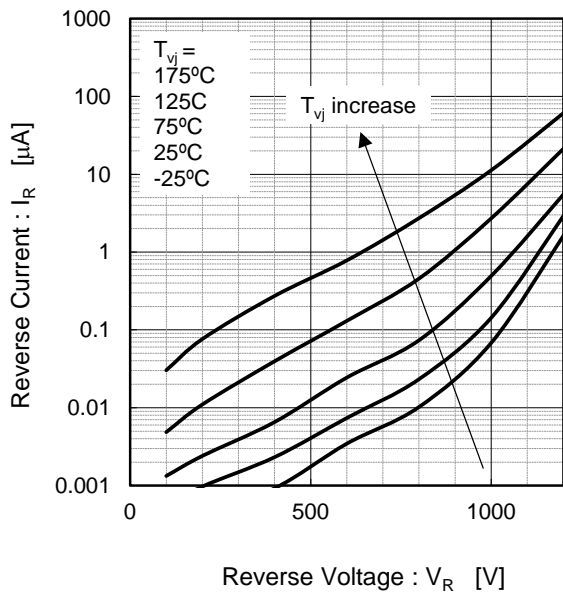
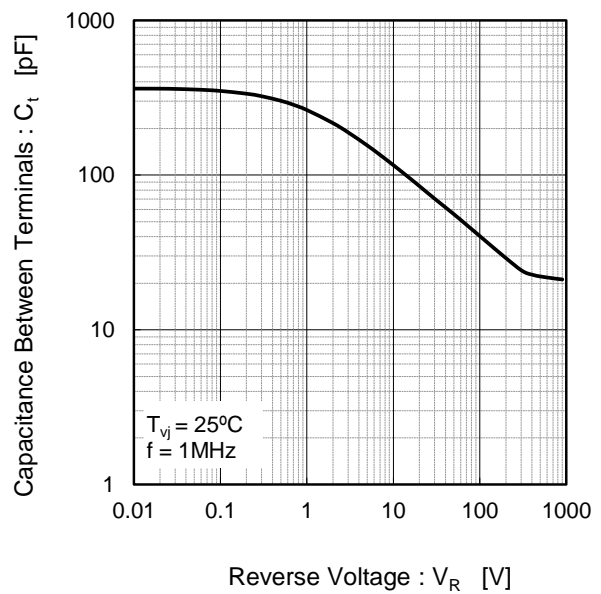


Fig.4  $V_R - C_t$  Characteristics



●Electrical characteristic curves

Fig.5 Typical Transient Thermal Impedance vs. Pulse Width

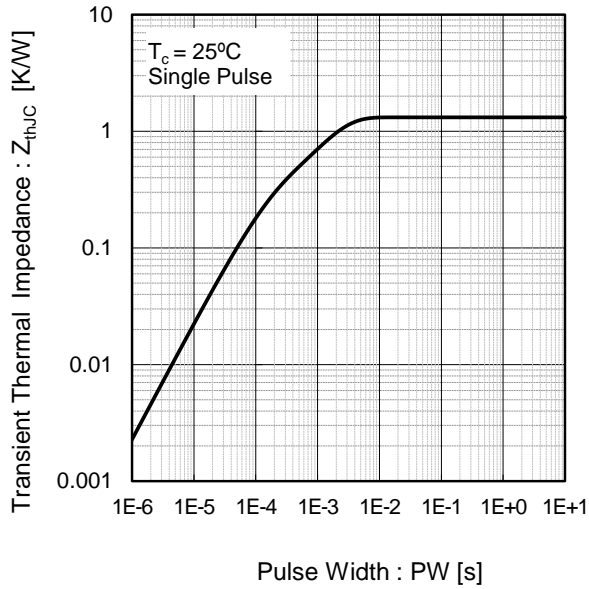


Fig.6 Power Dissipation

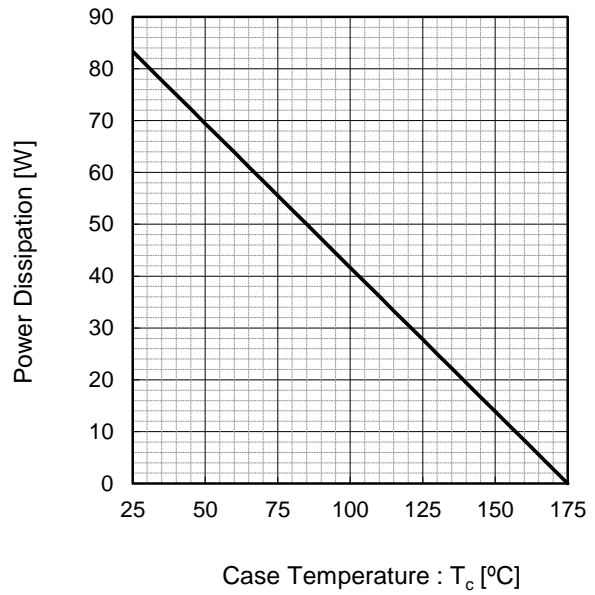
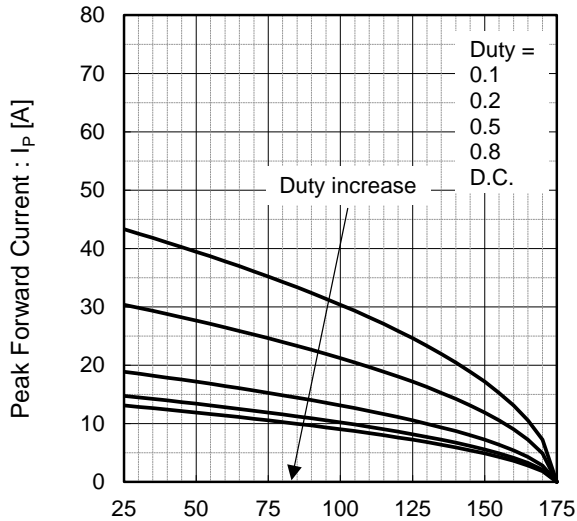
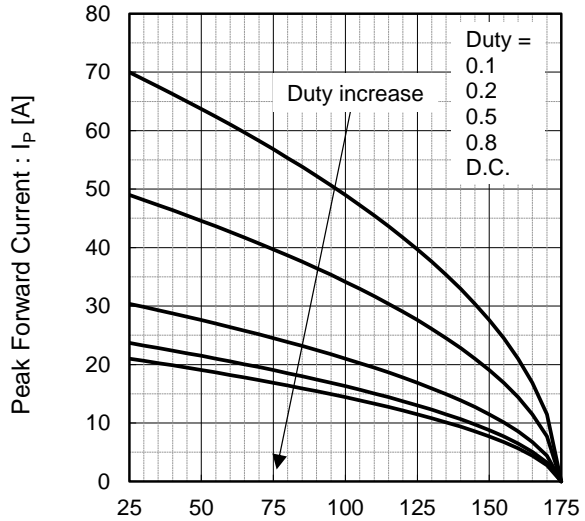


Fig.7\*4 Maximum peak forward current derating curve  $I_p - T_c$



\*4 Based on max Vf, max  $Z_{thJC}$   
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  $Z_{thJC}$   
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)

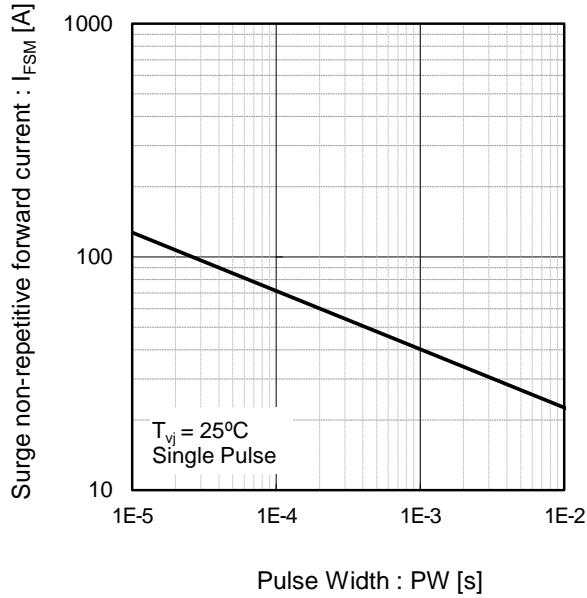
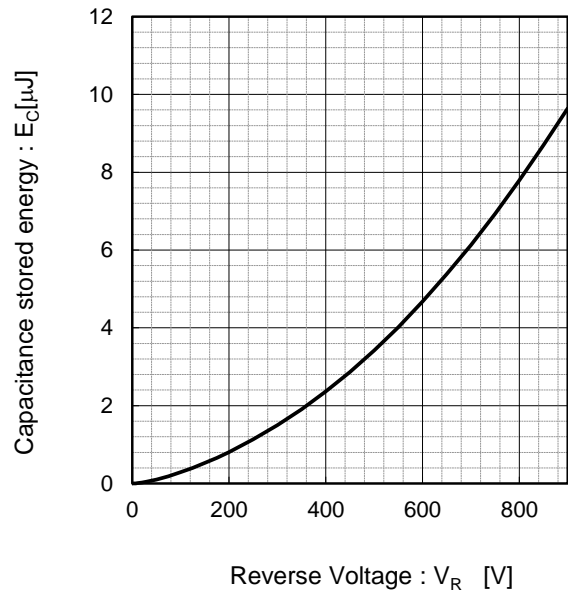
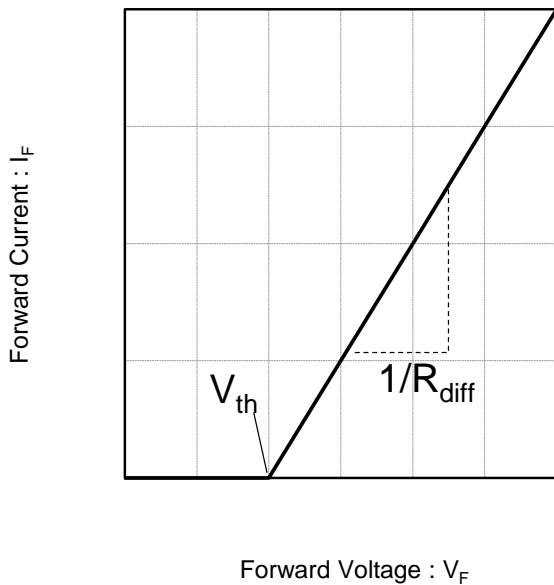


Fig.10 Typical capacitance stored energy



●Simplified forward characteristic model

Fig.11 Equivalent forward current curve



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

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

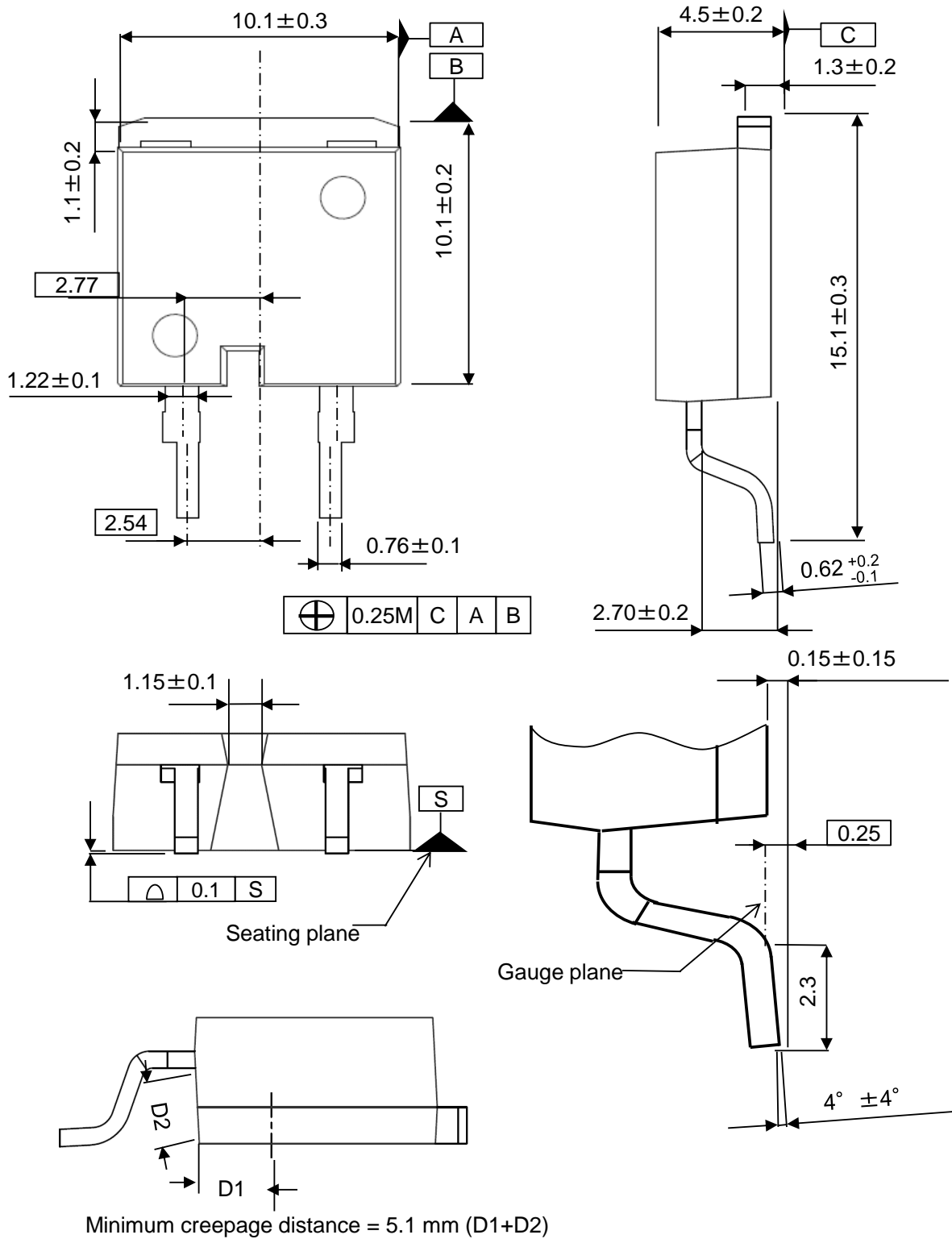
$$R_{diff}(T_{vj}) = b_0 + b_1 T_{vj} + b_2 T_{vj}^2$$

Symbol	Typical Value	Unit
$a_0$	$9.93 \times 10^{-1}$	V
$a_1$	$-1.27 \times 10^{-3}$	V/°C
$b_0$	$7.30 \times 10^{-2}$	$\Omega$
$b_1$	$4.12 \times 10^{-4}$	$\Omega/^\circ\text{C}$
$b_2$	$2.66 \times 10^{-6}$	$\Omega/^\circ\text{C}^2$

$T_{vj}$  in °C;  $-40^\circ\text{C} < T_{vj} < 175^\circ\text{C}$ ;  $I_F < 10\text{ A}$

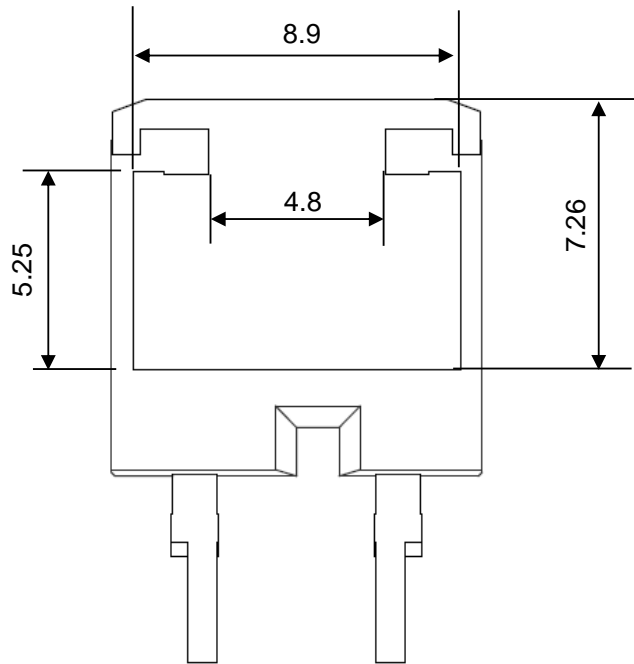
●Dimensions (Unit : mm)

Marking Side

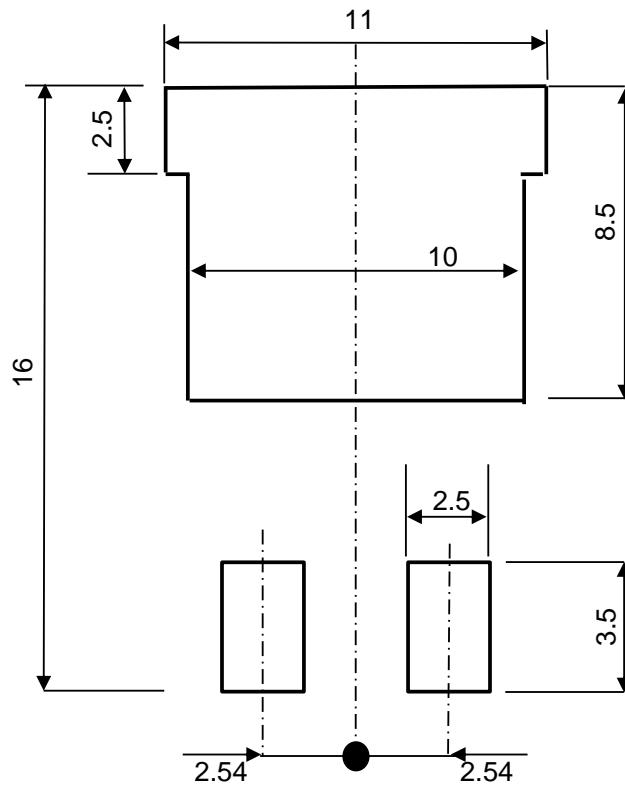


## ●Dimensions (Unit : mm)

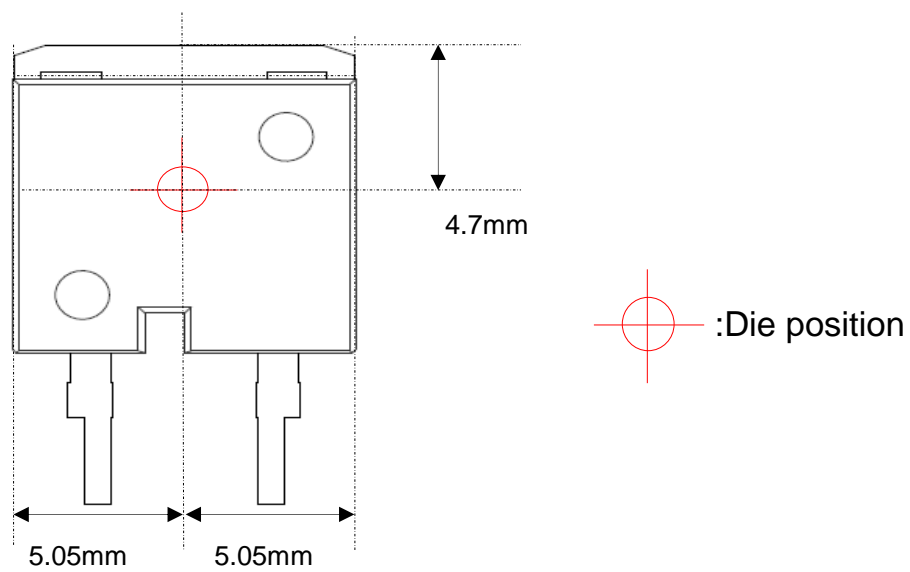
Back Side



Reference Copper Plate Area Dimension



## ●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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