

V_R	1200V
I_F	5A
Q_C	12nC

●Features

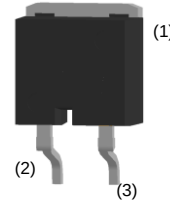
- 1) AEC-Q101 qualified
- 2) Low forward voltage
- 3) Negligible recovery time/current
- 4) Temperature independent switching behavior
- 5) Wide creepage distance = min. 5.10mm

●Applications

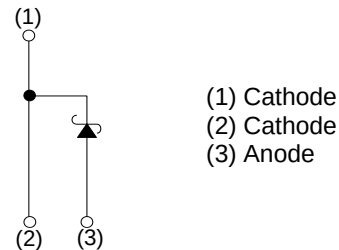
- On Board Charger
- DC/DC Converter
- Wireless Charger
- EV Charger

●Outline

TO-263-2L



●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 ^{*1}	A
Surge non-repetitive forward current	PW = 10ms sinusoidal, $T_{vj} = 25^\circ\text{C}$	I_{FSM}	23	A
	PW = 10ms sinusoidal, $T_{vj} = 150^\circ\text{C}$		17	A
	PW = 10μs square, $T_{vj} = 25^\circ\text{C}$		80	A
Repetitive peak forward current		I_{FRM}	26 ^{*2}	A
i^2t value	PW = 10ms, $T_{vj} = 25^\circ\text{C}$	$\int i^2 dt$	2.5	A ² s
	PW = 10ms, $T_{vj} = 150^\circ\text{C}$		1.4	A ² s
Total power dissipation		P_D	83 ^{*3}	W
Virtual Junction temperature		T_{vj}	175	°C
Range of storage temperature		T_{stg}	-40 to +175	°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°C unless otherwise specified)

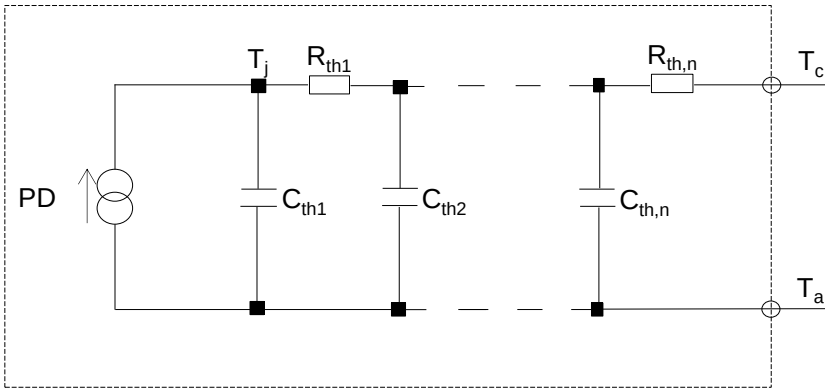
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V _{DC}	I _R = 0.1mA	1200	-	-	V
Forward voltage	V _F	I _F = 5A, T _{vj} = 25°C	-	1.4	1.6	V
		I _F = 5A, T _{vj} = 150°C	-	1.8	-	V
		I _F = 5A, T _{vj} = 175°C	-	1.9	-	V
Reverse current	I _R	V _R = 1200V, T _{vj} = 25°C	-	2.5	100	μA
		V _R = 1200V, T _{vj} = 150°C	-	40	-	μA
		V _R = 1200V, T _{vj} = 175°C	-	65	-	μA
Total capacitance	C	V _R = 1V, f= 1MHz	-	260	-	pF
		V _R = 800V, f= 1MHz	-	21	-	pF
Total capacitive charge	Q _C	V _R = 800V, di/dt = 500A/μs	-	12	-	nC
Switching time	t _c	V _R = 800V, di/dt = 500A/μs	-	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 × 10 ⁻¹	K/W	C _{th1}	4.38 × 10 ⁻⁴	Ws/K
R _{th2}	8.83 × 10 ⁻¹		C _{th2}	1.52 × 10 ⁻³	
R _{th3}	3.74 × 10 ⁻⁵		C _{th3}	3.83 × 10 ⁰	



●Electrical characteristic curves

Fig.1 $V_F - I_F$ Characteristics

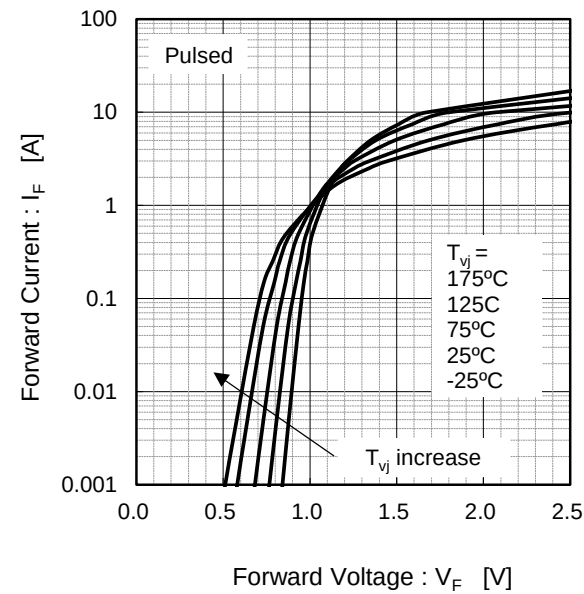


Fig.2 $V_F - I_F$ Characteristics

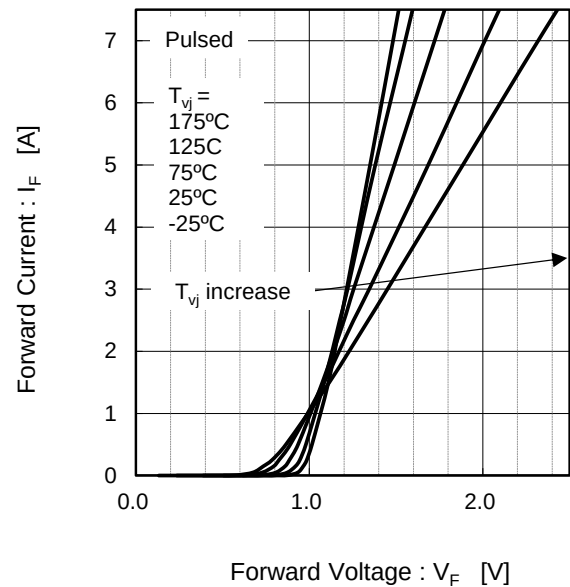


Fig.3 $V_R - I_R$ Characteristics

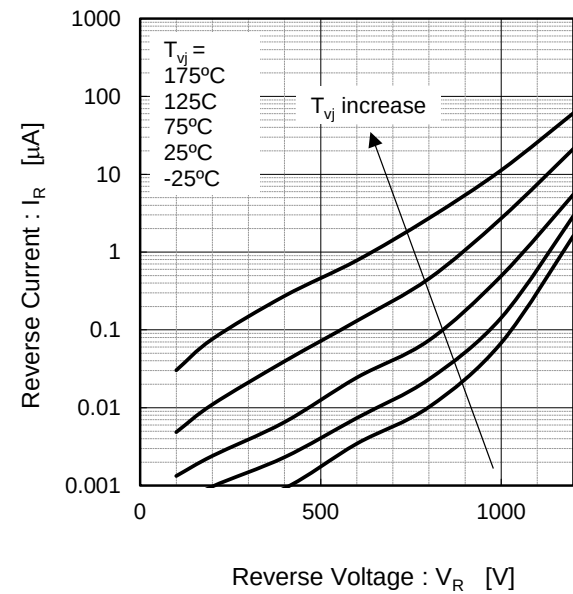
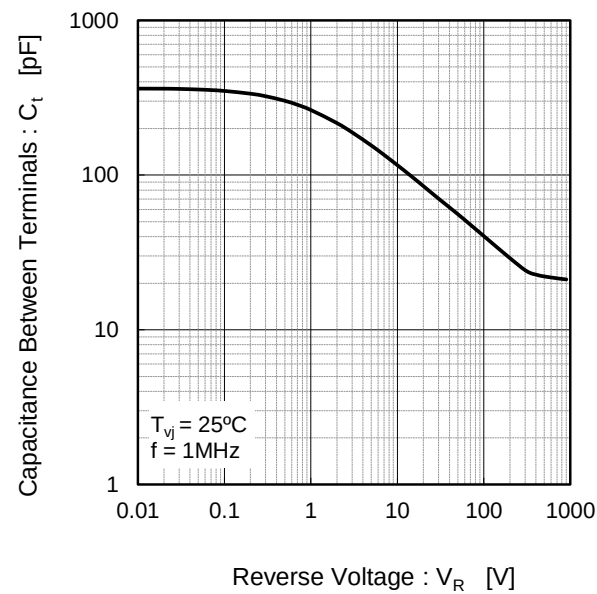


Fig.4 $V_R - C_t$ Characteristics



●Electrical characteristic curves

Fig.5 Typical Transient Thermal Impedance vs. Pulse Width

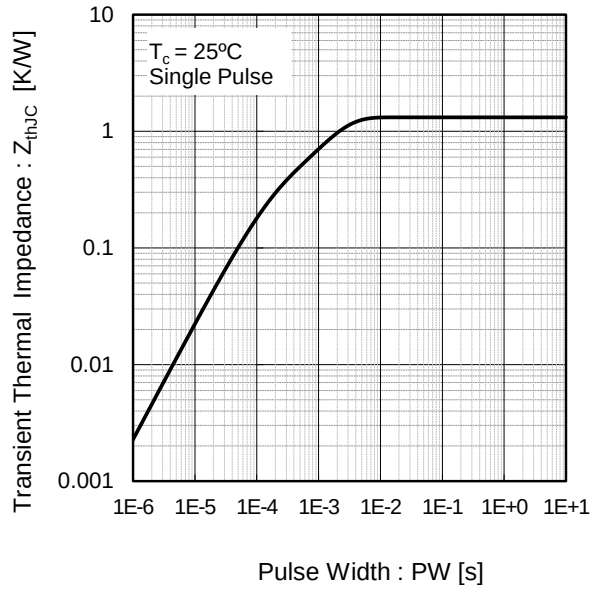


Fig.6 Power Dissipation

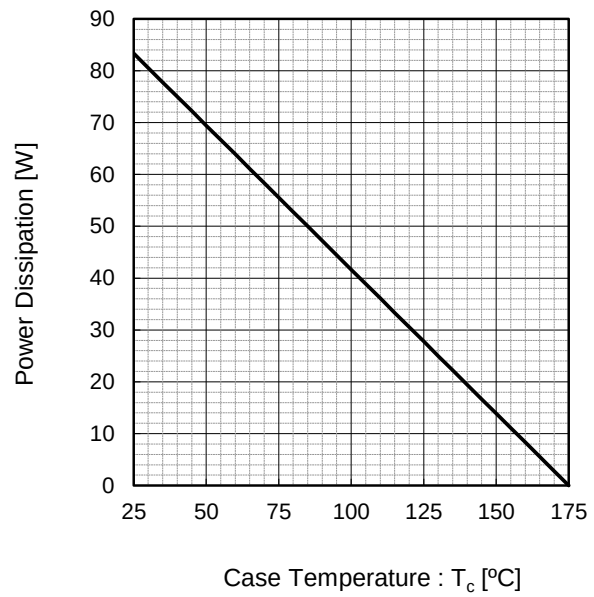
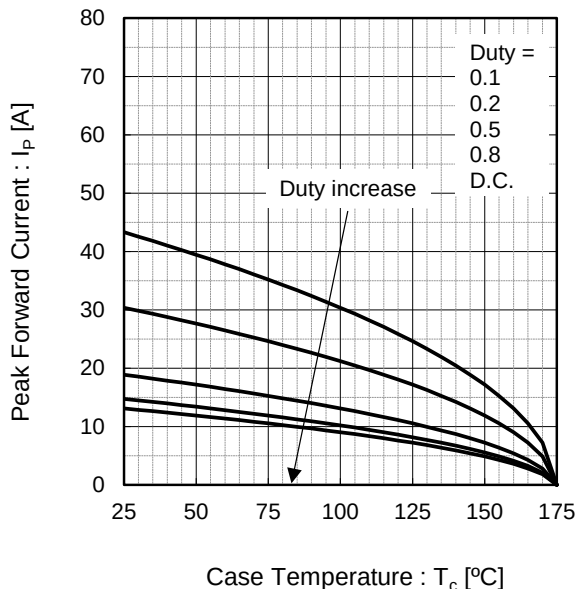
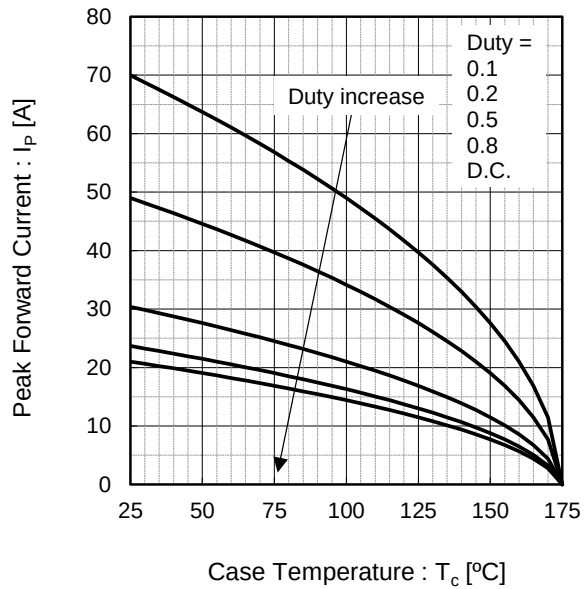


Fig.7*4 Maximum peak forward current derating curve $I_P - T_c$



Case Temperature : T_c [$^\circ\text{C}$]
 *4 Based on max V_f , 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)



Case Temperature : T_c [$^\circ\text{C}$]
 *5 Based on typ V_f , 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)

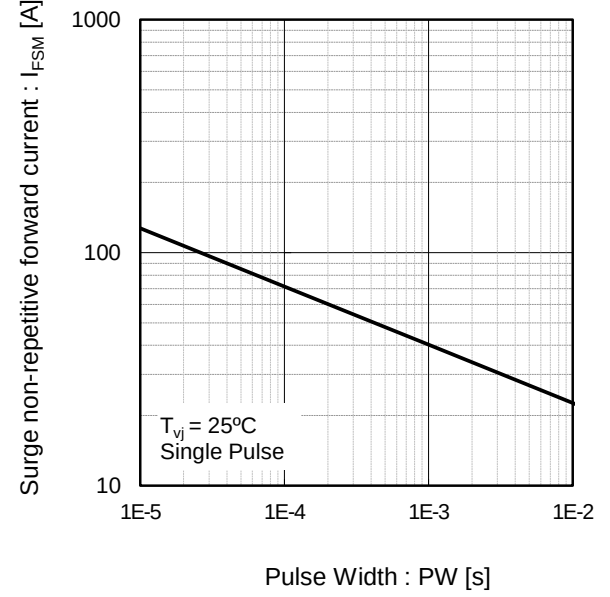
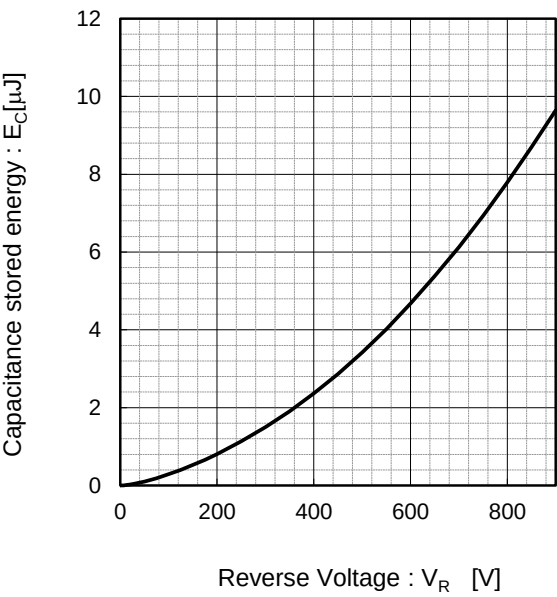
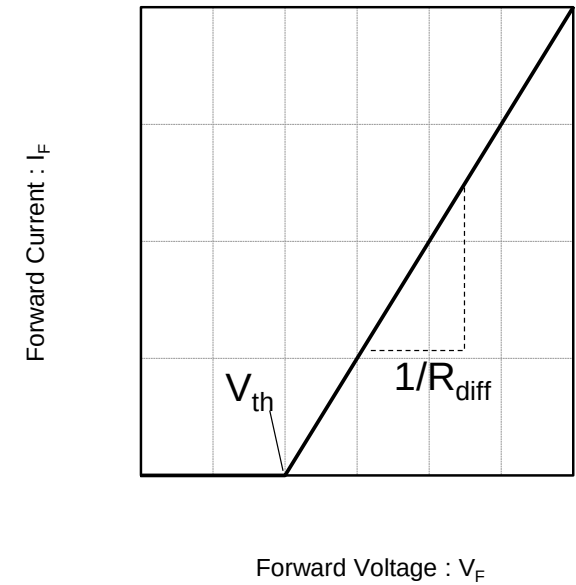


Fig.10 Typical capacitance stored energy



●Simplified forward characteristic model

Fig.11 Equivalent forward current curve



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

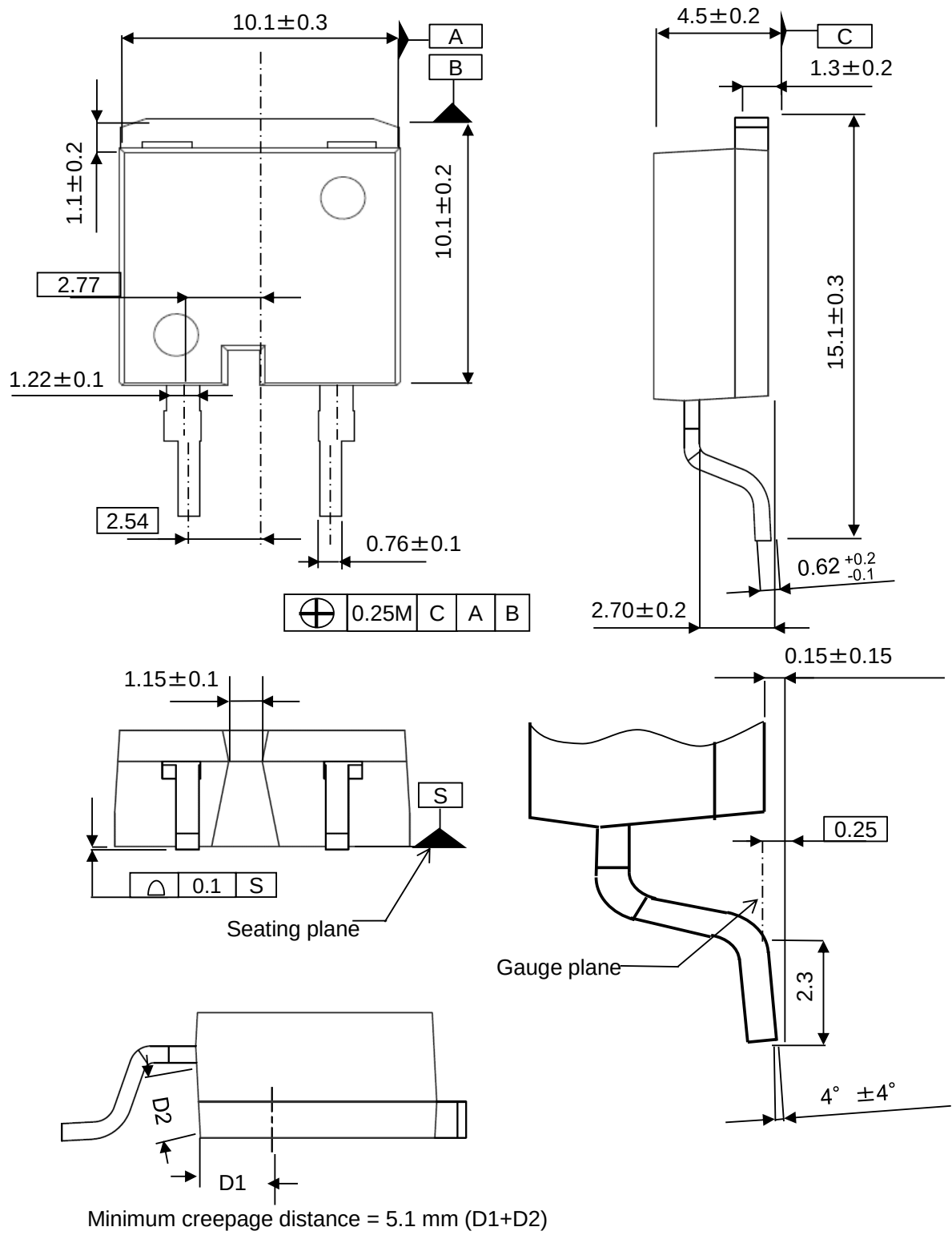
$$V_{th}(T_{vj}) = a_0 + a_1 T_{vj}$$
$$R_{diff}(T_{vj}) = b_0 + b_1 T_{vj} + b_2 T_{vj}^2$$

Symbol	Typical Value	Unit
a_0	9.93×10^{-1}	V
a_1	-1.27×10^{-3}	V/°C
b_0	7.30×10^{-2}	Ω
b_1	4.12×10^{-4}	Ω/°C
b_2	2.66×10^{-6}	Ω/°C ²

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

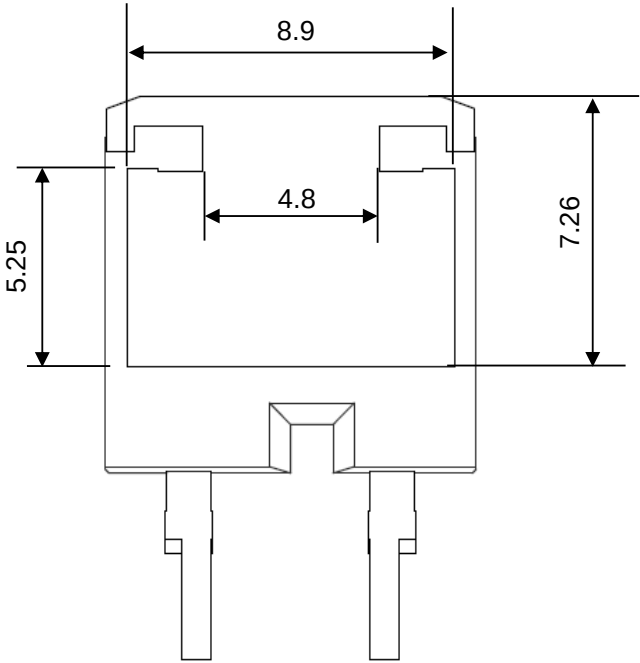
●Dimensions (Unit : mm)

Marking Side

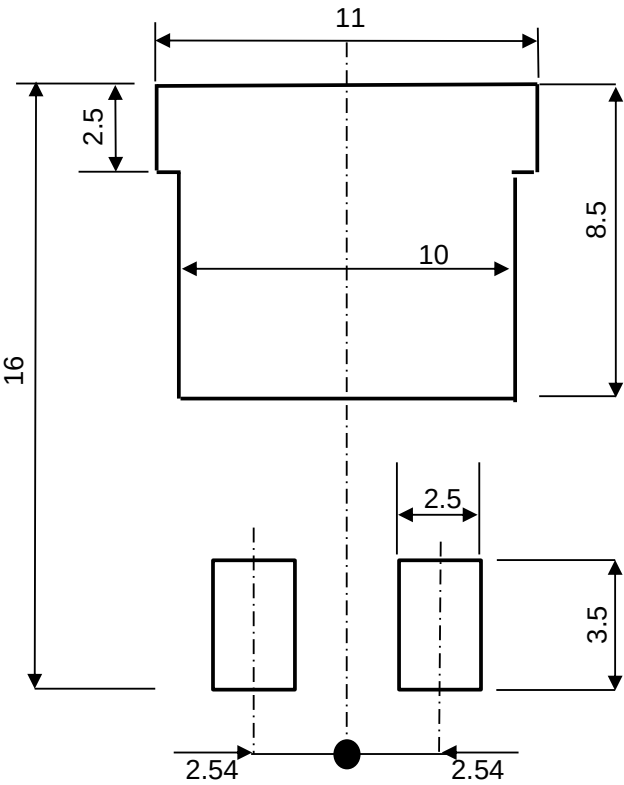


●Dimensions (Unit : mm)

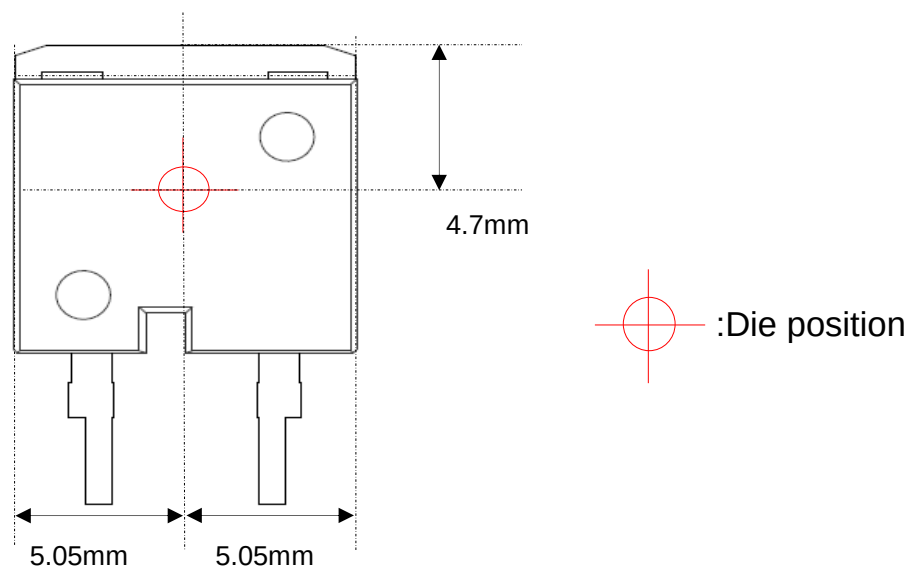
Back Side



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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