SCS210KE2HR

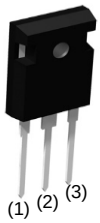
Automotive Grade SiC Schottky Barrier Diode Datasheet

V_R	1200V
I_F	5A/10A*
Q_C	17nC(Per leg)

(*Per leg/ Both legs)

●Outline

TO-247N



●Features

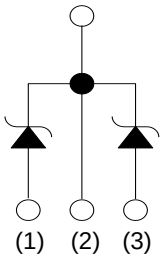
1) AEC-Q101 qualified

2) Low forward voltage

3) Negligible recovery time/current

4) Temperature independent switching behavior

●Inner circuit



●Applications

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

●Packaging specifications

Package		TO-247N
Type	Packing	Tube
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	30
	Packing code	C11
	Marking	SCS210KE2

●Absolute maximum ratings (T_{vj} = 25°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 *4	(T_c= 148°C)*1	I_F	5/10	A
Surge non-repetitive forward current *4	PW=10ms sinusoidal, T_{vj}=25°C	I_{FSM}	22/45	A
	PW=10ms sinusoidal, T_{vj}=150°C		17/34	A
	PW=10μs square, T_{vj}=25°C		89/170	A
Repetitive peak forward current *4		I_{FRM}	26/52*2	A
i^2t value*4	PW=10ms, T_{vj}=25°C	$\int i^2dt$	2.5/10	A^2s
	PW=10ms, T_{vj}=150°C		1.4/5	A^2s
Total power dissipation *4		P_D	83/160*1,3	W
Virtual Junction temperature		T_{vj}	175	°C
Range of storage temperature		T_{stg}	−55 to +175	°C

*1 Limited by maximum T_{vj} and for Max. R_{thJC}. *2 T_c=100°C, T_{vj}=150°C, Duty cycle=10%.
*3 T_c=25°C *4 Per leg/Both legs

©2024 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

●Electrical characteristics (T_{vj} = 25°C unless otherwise specified.) (Per Leg)

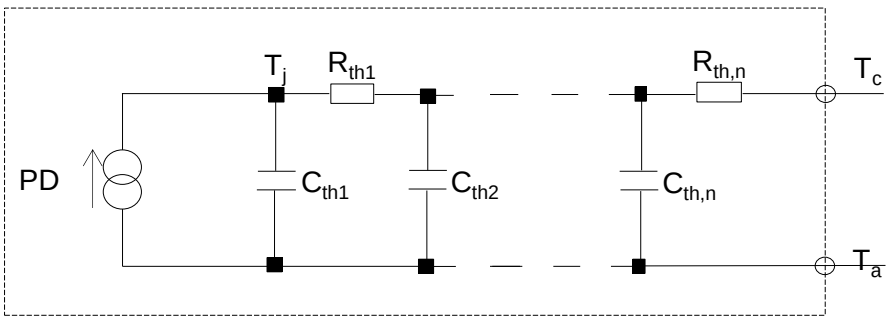
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
DC blocking voltage	V_{DC}	I_R =0.1mA	1200	-	-	V
Forward voltage	V_F	I_F=5A,T_{vj}=25°C	-	1.4	1.6	V
		I_F=5A,T_{vj}=150°C	-	1.8	-	V
		I_F=5A,T_{vj}=175°C	-	1.9	-	V
Reverse current	I_R	V_R=1200V,T_{vj}=25°C	-	5	100	μA
		V_R=1200V,T_{vj}=150°C	-	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	-	17	-	nC
Switching time	t_C	V_R=800V,di/dt=500A/μs	-	15	-	ns

●Thermal characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance	R_{thJC}	Per Leg	-	1.5	1.8	K/W
		Both Legs	-	0.75	0.90	K/W

●Typical Transient Thermal Characteristics (Per Leg)

Symbol	Value	Unit	Symbol	Value	Unit
R_{th1}	4.22×10^{-1}	K/W	C_{th1}	2.40×10^{-3}	Ws/K
R_{th2}	9.58×10^{-1}		C_{th2}	5.95×10^{-3}	
R_{th3}	1.19×10^{-1}		C_{th3}	1.40×10^{-1}	



©2024 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

●Electrical characteristic curves

Fig.1 V_F - I_F Characteristics (Per Leg)

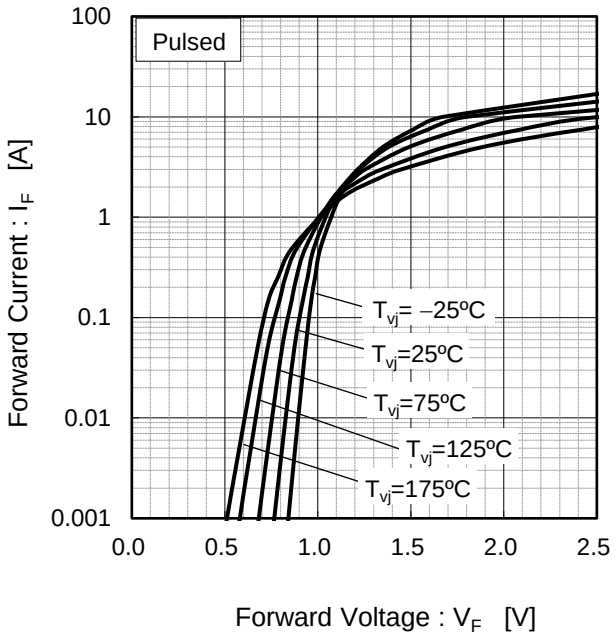


Fig.2 V_F - I_F Characteristics (Per Leg)

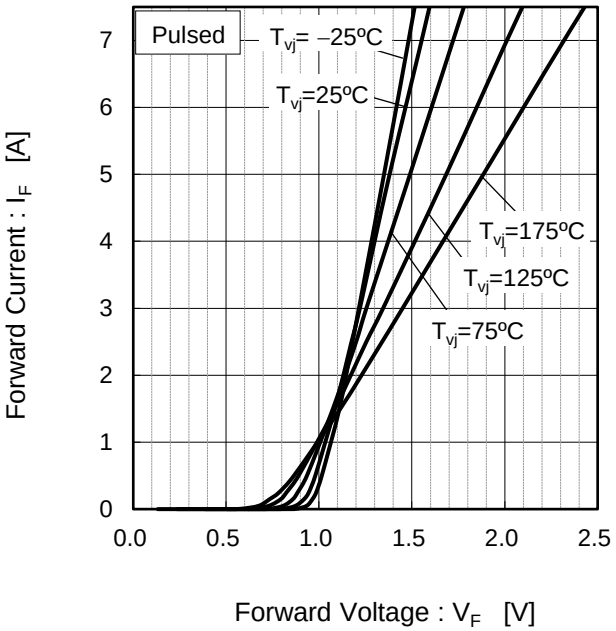


Fig.3 V_R - I_R Characteristics (Per Leg)

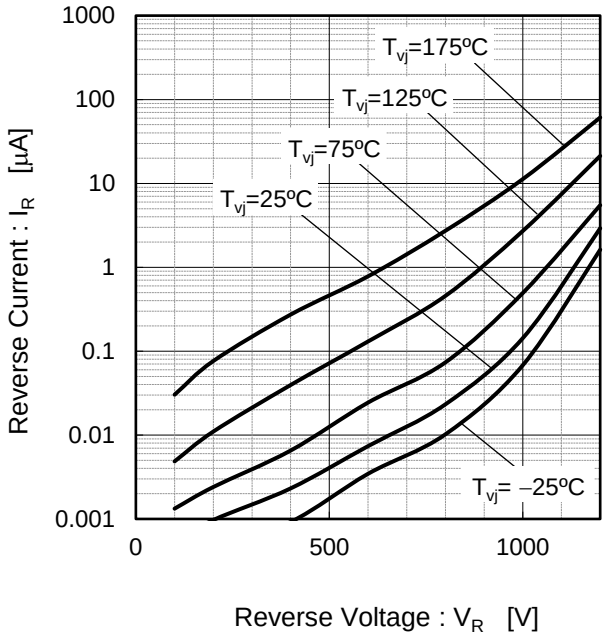
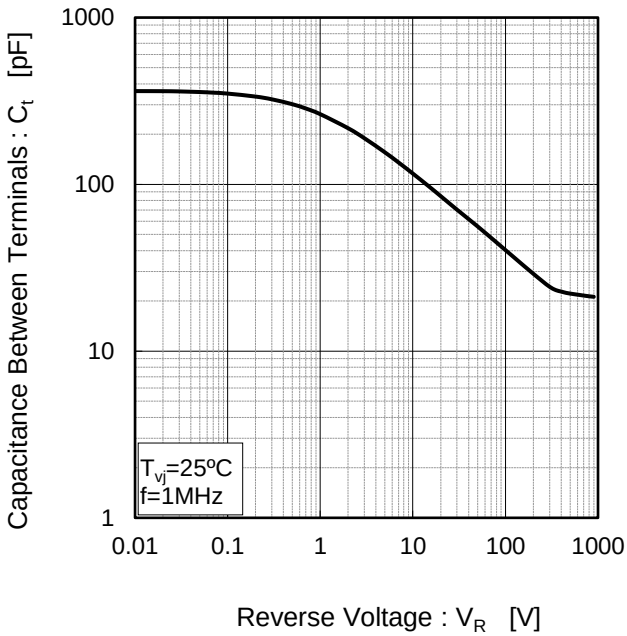


Fig.4 V_R - C_t Characteristics (Per Leg)



©2024 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

●Electrical characteristic curves

Fig.5 Typical Transient Thermal Impedance vs. Pulse Width (Per Leg)

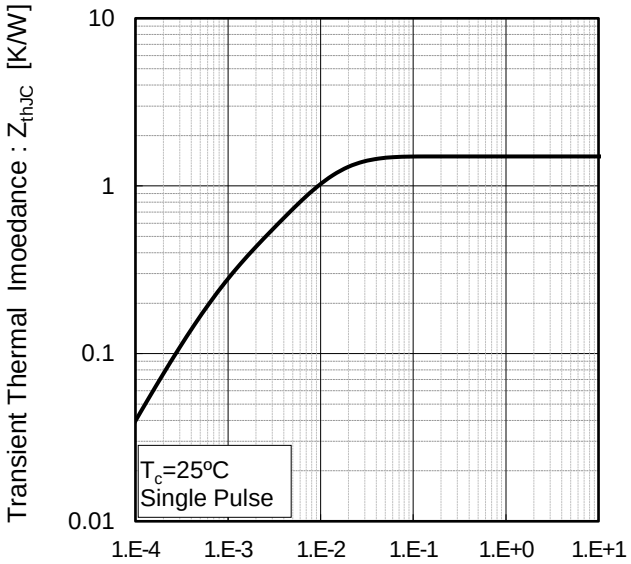


Fig.6 Power Dissipation (Per Leg)

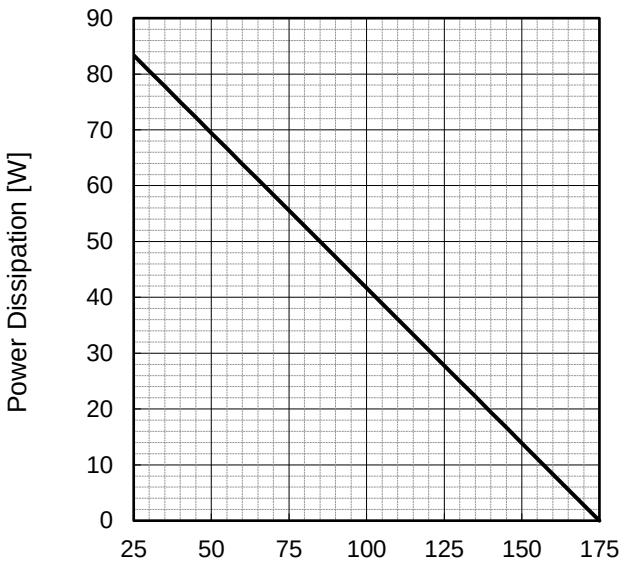
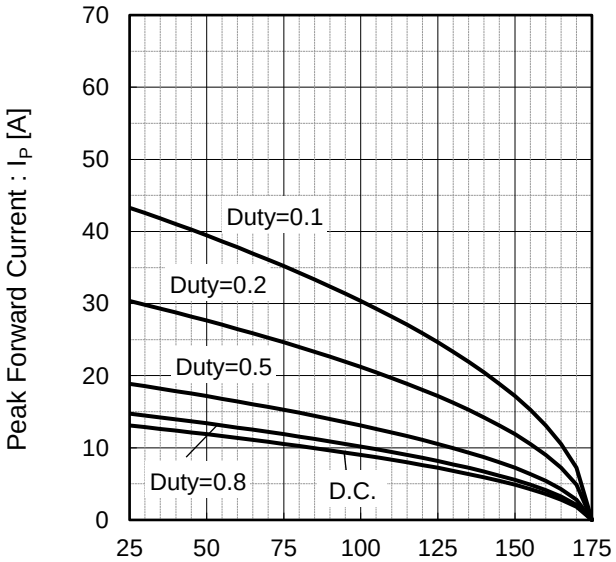
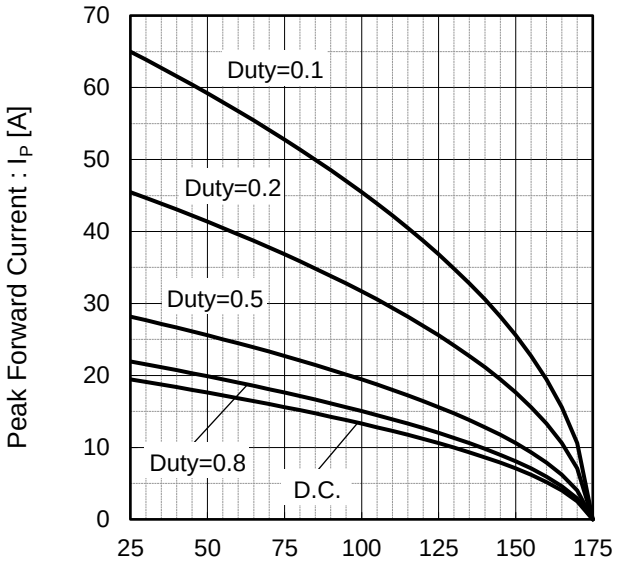


Fig.7*5 Maximum peak forward current derating curve I_P - T_c (Per Leg)



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

Fig.8*6 Typical peak forward current derating curve I_P - T_c (Per Leg, Not guaranteed)



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

©2024 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

●Electrical characteristic curves

Fig.9 Surge non-repetitive forward current vs. Pulse width (Sinusoidal waveform) (Per Leg)

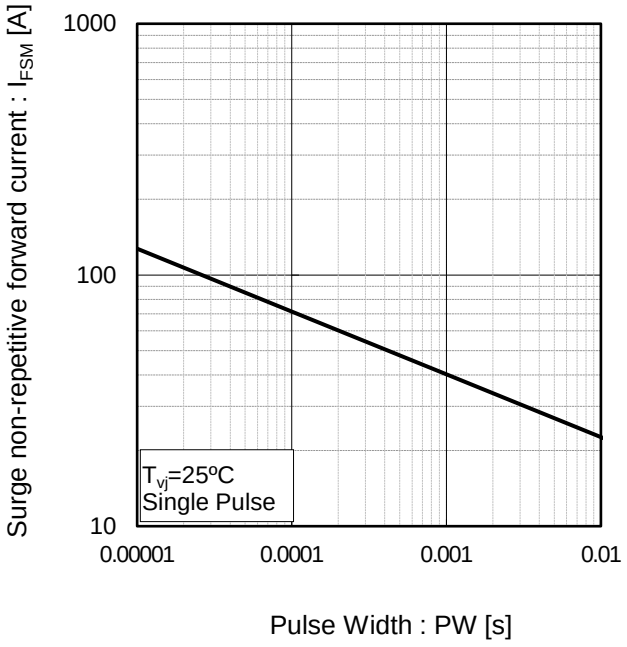
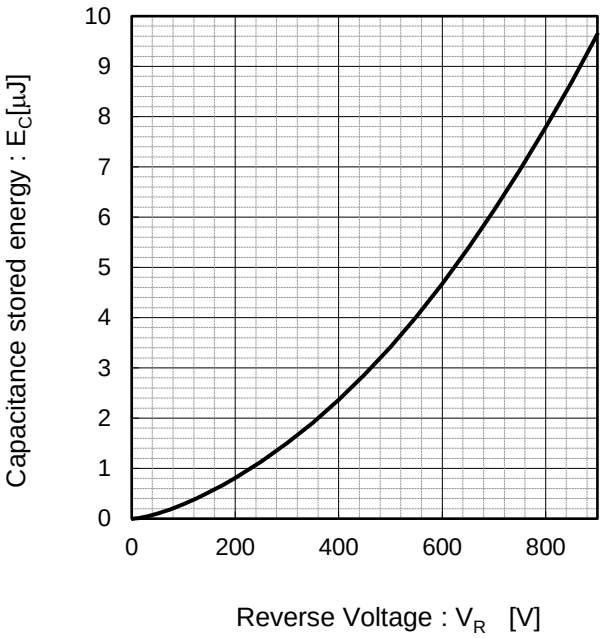
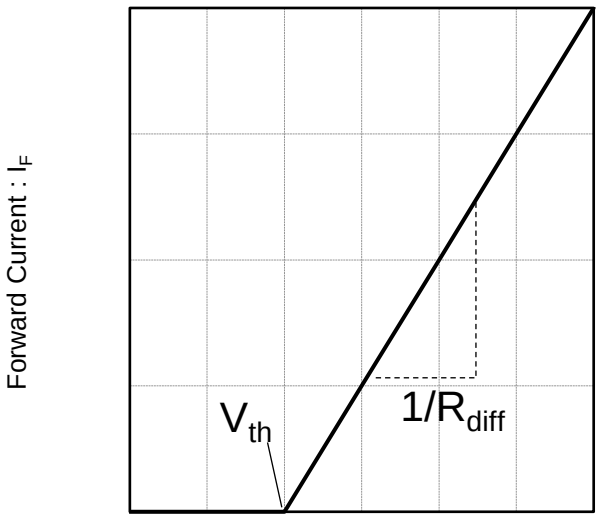


Fig.10 Typical capacitance store energy (Per Leg)



●Symplified forward characteristic model (Per Leg)

Fig.11 Equivalent forward current curve



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

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

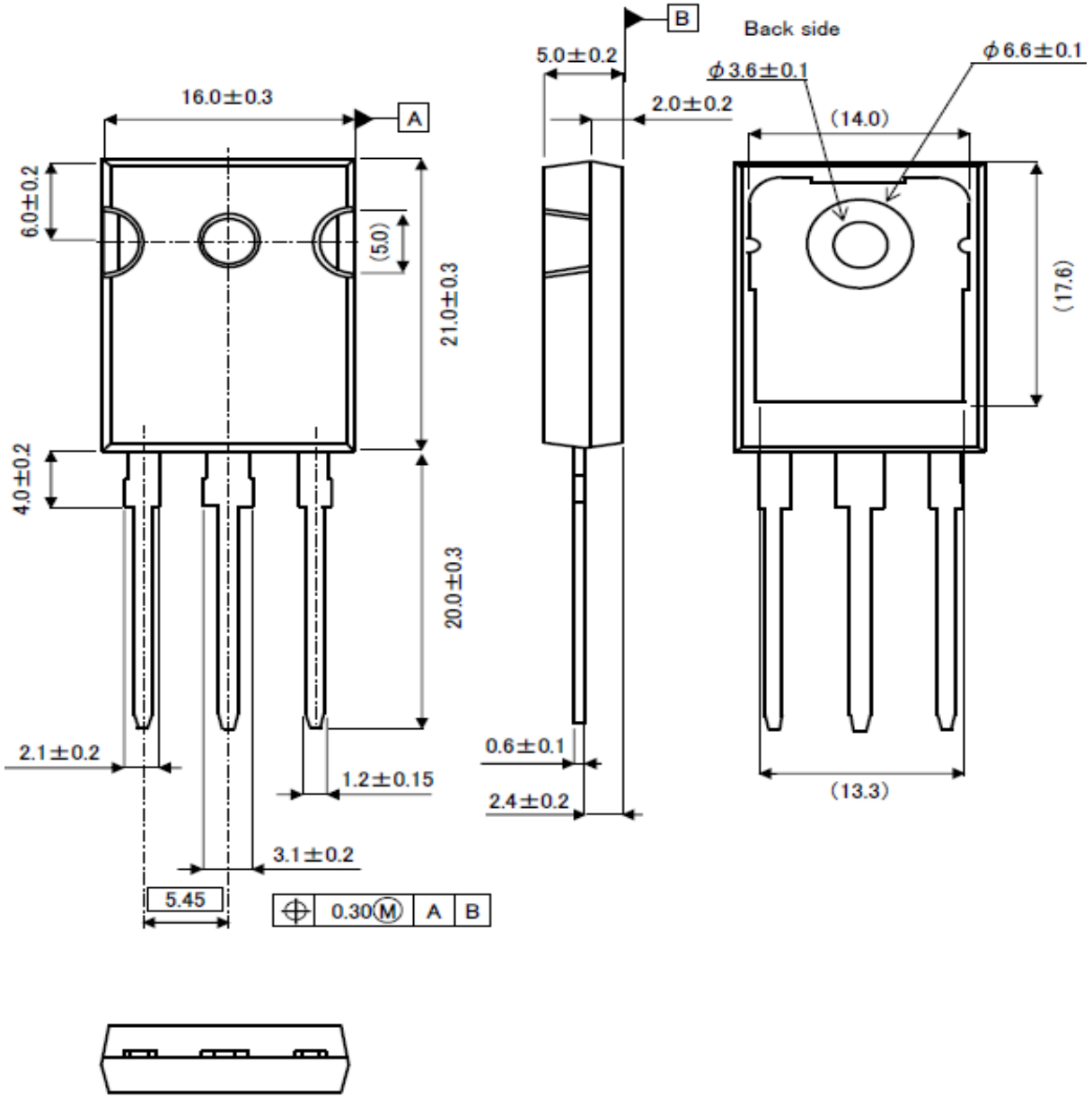
Symbol	Typical Value	Unit
a_0	9.93×10^{-1}	V
a_1	-1.27×10^{-3}	V/°C
b_0	7.30×10^{-2}	Ω
b_1	4.12×10^{-4}	Ω/°C
b_2	2.66×10^{-6}	Ω/°C^2

T_{vj} in ºC; -55 ºC < T_{vj} < 175 ºC ; I_F < 10 A

©2024 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

●Package Dimensions

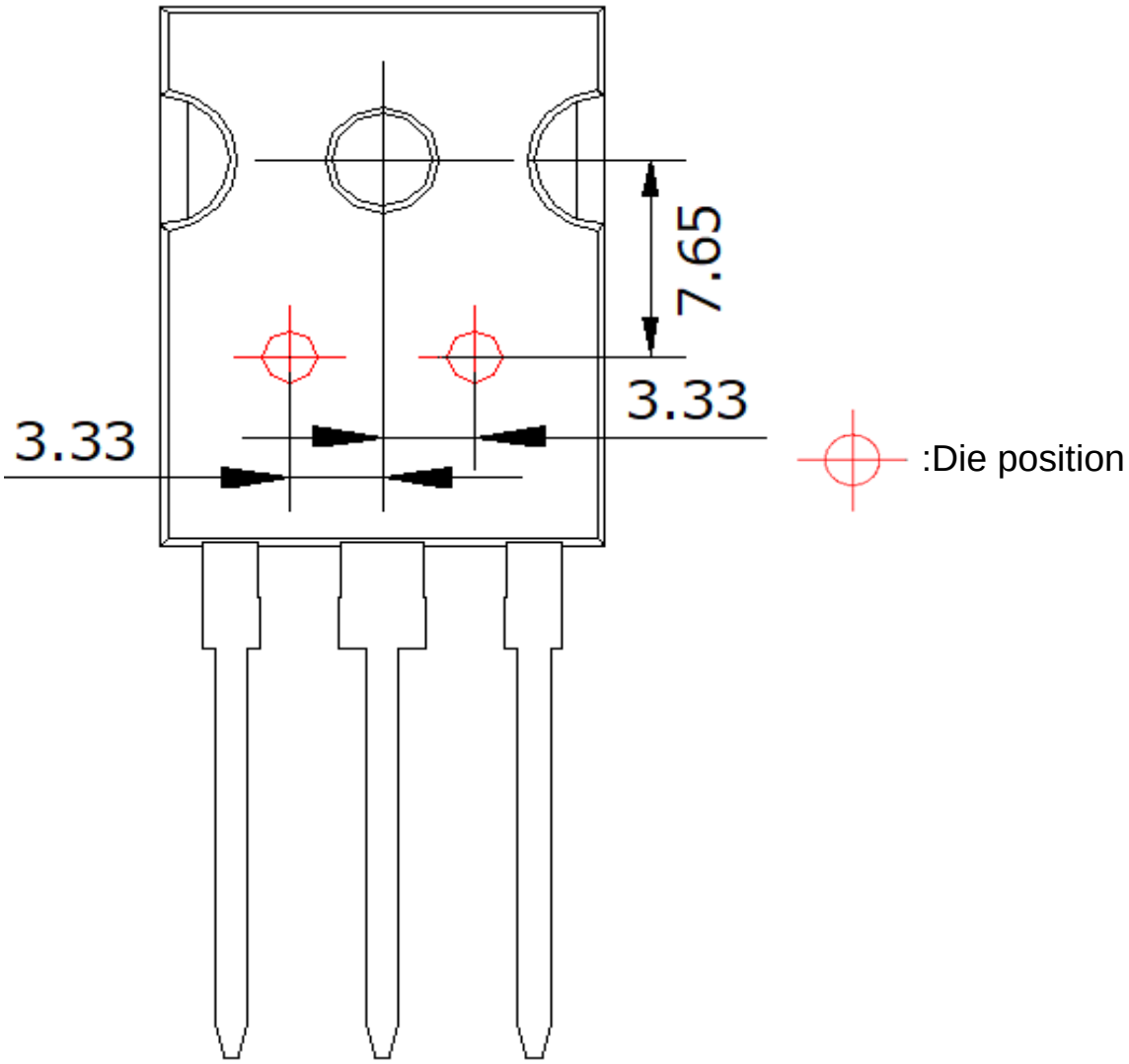


Unit: mm

©2024 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

●**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

©2024 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

Notes

1) The information contained herein is subject to change without notice.

2) Before you use our Products, please contact our sales representative and verify the latest specifications.

3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. ROHM shall have no responsibility for any damages arising out of the use of our Poducts beyond the rating specified by ROHM.

4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

5) The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM or any other parties. ROHM shall have no responsibility whatsoever for any dispute arising out of the use of such technical information.

6) The Products specified in this document are not designed to be radiation tolerant.

7) For use of our Products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a ROHM representative : transportation equipment (i.e. cars, ships, trains), primary communication equipment, traffic lights, fire/crime prevention, safety equipment, medical systems, and power transmission systems.

8) Do not use our Products in applications requiring extremely high reliability, such as aerospace equipment, nuclear power control systems, and submarine repeaters.

9) ROHM shall have no responsibility for any damages or injury arising from non-compliance with the recommended usage conditions and specifications contained herein.

10) ROHM has used reasonable care to ensure the accuracy of the information contained in this document. However, ROHM does not warrants that such information is error-free, and ROHM shall have no responsibility for any damages arising from any inaccuracy or misprint of such information.

11) Please use the Products in accordance with any applicable environmental laws and regulations, such as the RoHS Directive. For more details, including RoHS compatibility, please contact a ROHM sales office. ROHM shall have no responsibility for any damages or losses resulting non-compliance with any applicable laws or regulations.

12) When providing our Products and technologies contained in this document to other countries, you must abide by the procedures and provisions stipulated in all applicable export laws and regulations, including without limitation the US Export Administration Regulations and the Foreign Exchange and Foreign Trade Act.

13) This document, in part or in whole, may not be reprinted or reproduced without prior consent of ROHM.

ROHM SEMICONDUCTOR

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/

© 2012 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.

General Precaution

1. Before you use our Products, you are requested to carefully read this document and fully understand its contents. ROHM shall not be in any way responsible or liable for failure, malfunction or accident arising from the use of any ROHM's Products against warning, caution or note contained in this document.

2. All information contained in this document is current as of the issuing date and subject to change without any prior notice. Before purchasing or using ROHM's Products, please confirm the latest information with a ROHM sales representative.

3. The information contained in this document is provided on an "as is" basis and ROHM does not warrant that all information contained in this document is accurate and/or error-free. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties resulting from inaccuracy or errors of or concerning such information.

© 2015 ROHM Co., Ltd. All rights reserved.

Downloaded from Arrow.com.