T1D10170A

Silicon Carbide Schottky Diode 1700 V, 10 A

General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

Product Summary

V_{RRM}	1700 V
I_F (T_C 150°C)	10 A
V_F (T_j 25℃)	1.4 V

Features

- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_C
- Highly rugged due to better surge current
- Industrial standard quality and reliability

RoHS

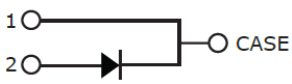
Halogen Free

Applications

- UPS
- Power Inverter
- High performance SMPS
- Power factor correction

TO-220AC

Equivalent circuit



Package Marking and Ordering Information

Part #	Marking	Package
T1D10170A	1D10170A	TO-220AC

Maximum Ratings (at Tc = 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	1700	V
Surge Peak Reverse Voltage	V_{RSM}	1700	V
DC Peak Reverse Voltage	V_R	1700	V
Continuous Forward Current T_C = 25°C T_C = 110°C T_C = 150°C	I_F	 25 17 10	A
Repetitive Peak Forward Surge Current T_C = 25°C,t_p=10ms,Half Sine Pulse T_C = 110°C,t_p=10ms,Half Sine Pulse	I_{FRM}	 45 25	A
Non-Repetitive Forward Surge Current T_C = 25°C,t_p=10ms,Half Sine Pulse T_C = 110°C,t_p=10ms,Half Sine Pulse	I_{FSM}	 105 70	A
i^2dt value T_C = 25°C,t_p=10ms,Half Sine Pulse T_C = 110°C,t_p=10ms,Half Sine Pulse	$\int i^2dt$	 55 24	A^2s
Power dissipation T_C = 25°C T_C = 110°C	P_{tot}	 100 43	W
Operating junction Range	T_j	-55 to +175	°C
Storage temperature Range	T_{stg}	-55 to +150	°C

Thermal Resistance

Parameter	Symbol	Typ.	Unit
Thermal resistance, junction – case.	$R_{thJC(TYP)}$	1.50	°C/W

Electrical Characteristic (at Tc = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V_F	-	1.4	1.7	V	I_F=10A T_j=25°C
		-	2.2			T_j=175°C
Reverse Current	I_R	-	6	100	μA	V_R=1700V T_j=25°C
		-	40	200		T_j=175°C
Total Capacitive Charge	Q_C	-	109	-	nC	V_R=1700V, T_j=25°C $Q_C = \int_0^{V_R} C(V)dV$
Total Capacitance	C	-	950	-	pF	T_j=25°C, f=100KHz V_R=0V
		-	47	-		V_R=800V
		-	45	-		V_R=1700V

Characteristics Curve:

Fig 1: Forward Characteristics

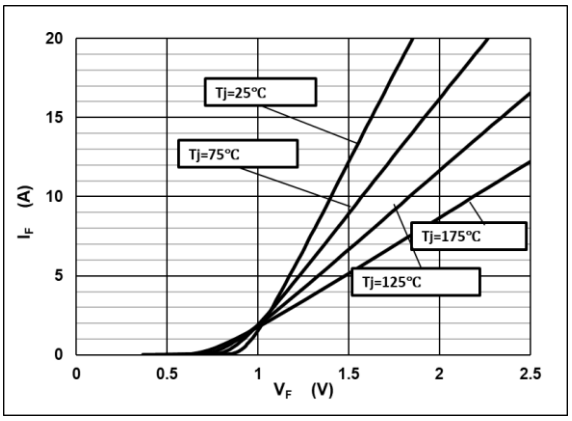


Fig 2: Reverse Characteristics

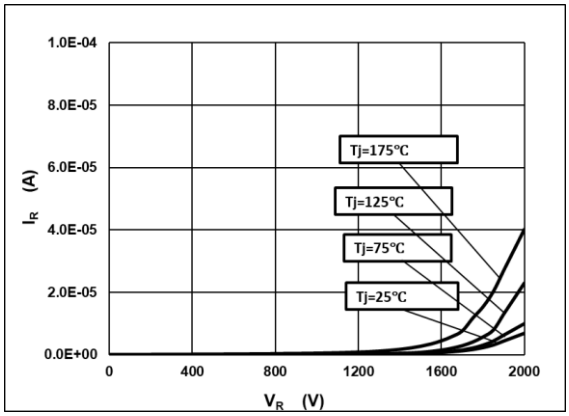


Fig 3: Current Derating

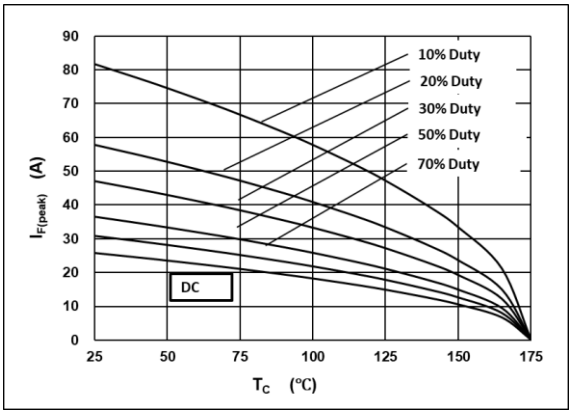


Fig 4: Power Derating

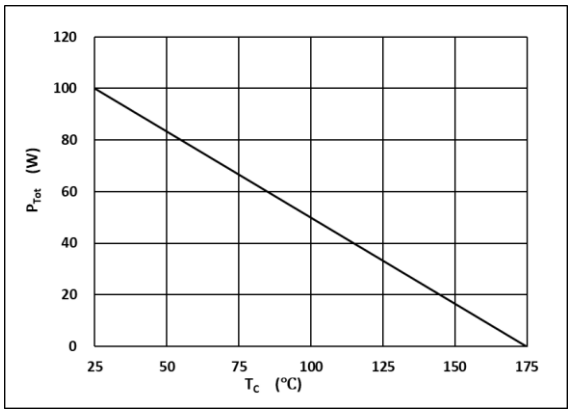


Fig 5: Capacitance vs. Reverse Voltage

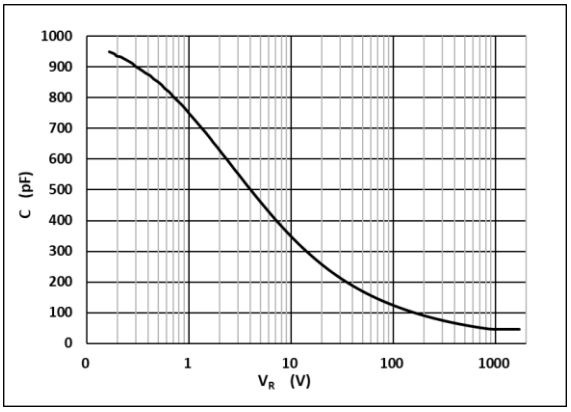


Fig 6: Reverse Charge vs. Reverse Voltage

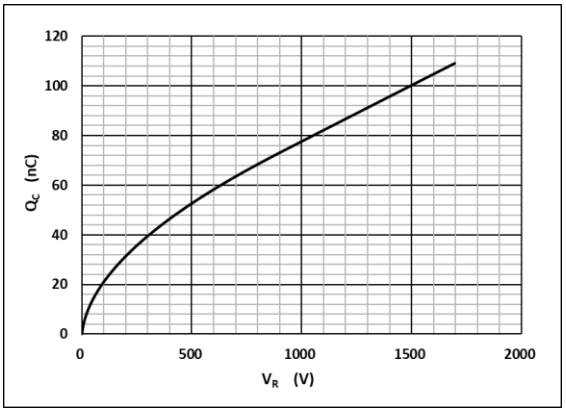


Fig 7: Typical Capacitance Stored Energy

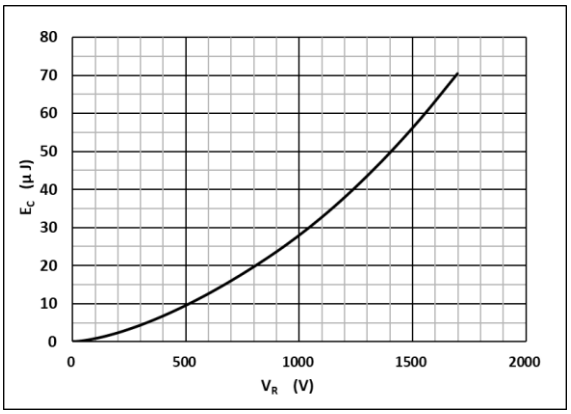
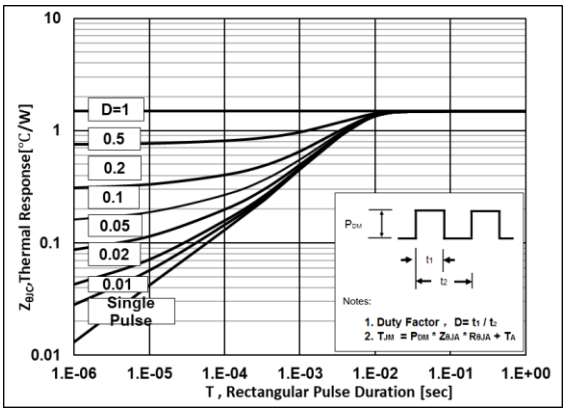
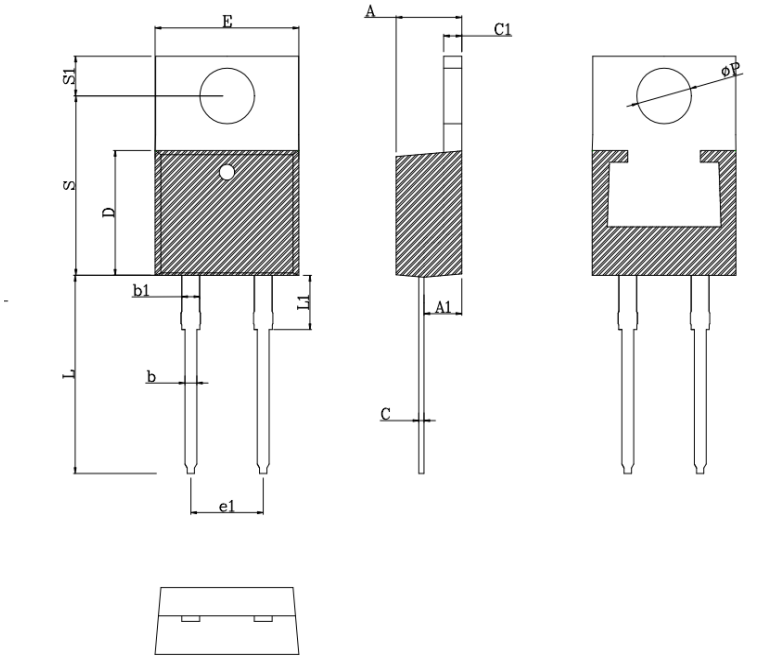


Fig 8: Transient Thermal Impandance



Mechanical Dimensions:



COMMON DIMENSIONS

SYMBOL	mm		
	Min	Nom	Max
A	4.55	4.60	4.65
A1	2.60	2.65	2.70
C	0.33	0.38	0.50
C1	1.22	1.27	1.37
E	10.00	10.12	10.30
D	8.50	8.60	8.70
S	12.20	12.35	12.50
S1	2.64	2.74	2.84
L	13.50	13.65	13.80
L1	3.59	3.74	3.89
b	0.76	0.81	0.86
b1	1.20	1.25	1.30
e1	4.93	5.08	5.23
ØP	3.75	3.85	4.00

Contact Information

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For additional information, please contact your local Sales Representative.

Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up -to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

TANI reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with TANI to ensure that the prod uct specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult TANI in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third- party legal rights. TANI shall assume no responsibility for any disputes or controv ersies arising from the above-mentioned issues in any form.