

## 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

$V_{RRM}$	1200 V
$I_F (T_C 160^{\circ}C)$	12 A
$V_F (T_j 25^{\circ}C)$	1.35 V

## Features

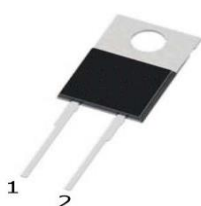
- Low conduction loss due to low  $V_F$
- Extremely low switching loss by tiny  $Q_C$
- Highly rugged due to better surge current
- Industrial standard quality and reliability



## Applications

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

## TO-220-2



## Equivalent circuit



## Package Marking and Ordering Information

Part #	Marking	Package
T1D12120A	1D12120A	TO-220-2

**Maximum Ratings (at  $T_C = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)**

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$	1200	V
Surge Peak Reverse Voltage	$V_{RSM}$	1200	V
DC Peak Reverse Voltage	$V_R$	1200	V
Continuous Forward Current $T_C = 25^{\circ}\text{C}$ $T_C = 135^{\circ}\text{C}$ $T_C = 160^{\circ}\text{C}$	$I_F$	39 20 12	A
Repetitive Peak Forward Surge Current $T_C = 25^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_C = 110^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	$I_{FRM}$	84 63	A
Non-Repetitive Forward Surge Current $T_C = 25^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_C = 110^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	$I_{FSM}$	130 108	A
$i^2dt$ value $T_C = 25^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_C = 110^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	$\int i^2 dt$	84.5 58	$\text{A}^2\text{s}$
Power dissipation $T_C = 25^{\circ}\text{C}$ $T_C = 110^{\circ}\text{C}$	$P_{tot}$	150 65	W
Operating junction Range	$T_j$	-55 to +175	$^{\circ}\text{C}$
Storage temperature Range	$T_{stg}$	-55 to +150	$^{\circ}\text{C}$

**Thermal Resistance**

Parameter	Symbol	Typ.	Unit
Thermal resistance, junction – case.	$R_{thJC}$	1.0	$^{\circ}\text{C/W}$

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

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V <sub>F</sub>	-	1.35	1.7	V	I <sub>F</sub> =12A T <sub>j</sub> =25°C T <sub>j</sub> =175°C
Reverse Current	I <sub>R</sub>	-	-	150	μA	V <sub>R</sub> =1200V T <sub>j</sub> =25°C T <sub>j</sub> =175°C
Total Capacitive Charge	Q <sub>C</sub>	-	75.6	-	nC	V <sub>R</sub> =800V, T <sub>j</sub> =25°C $Q_C = \int_0^{V_R} C(V)dV$
Total Capacitance	C	-	1022	-	pF	T <sub>j</sub> =25°C, f=1MHz V <sub>R</sub> =0V V <sub>R</sub> =400V V <sub>R</sub> =800V

Characteristics Curve:

Fig 1: Forward Characteristics

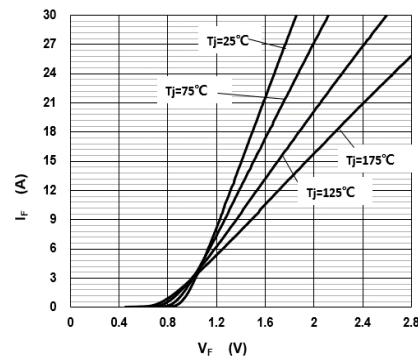


Fig 2: Reverse Characteristics

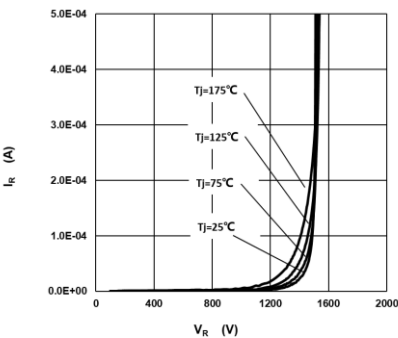


Fig 3: Current Derating

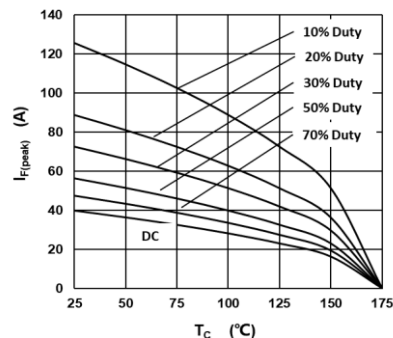


Fig 4: Power Derating

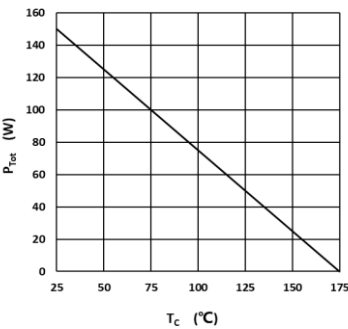


Fig 5: Capacitance vs. Reverse Voltage

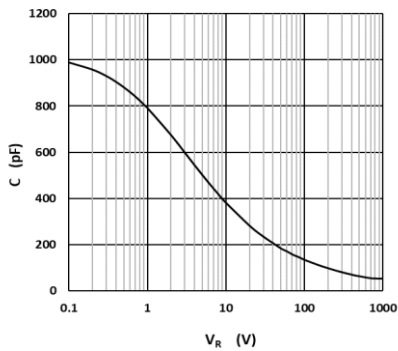


Fig 6: Reverse Charge vs. Reverse Voltage

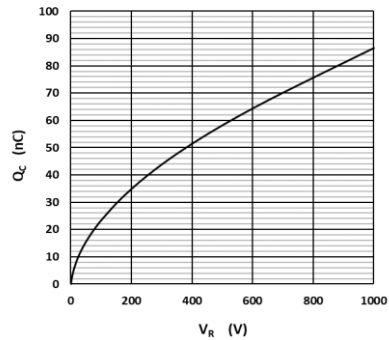


Fig 7: Typical Capacitance Stored Energy

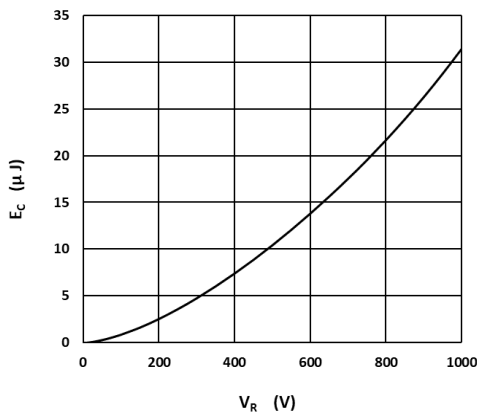
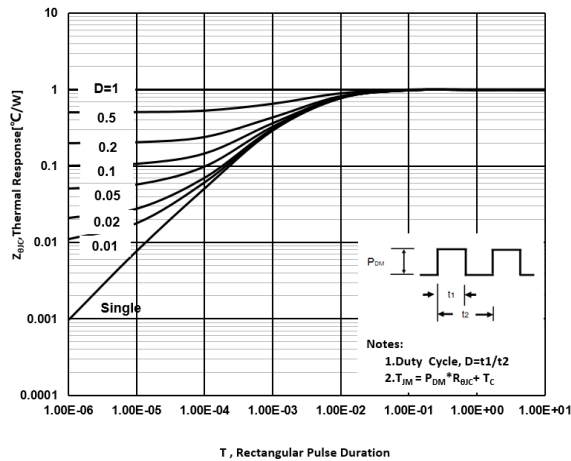
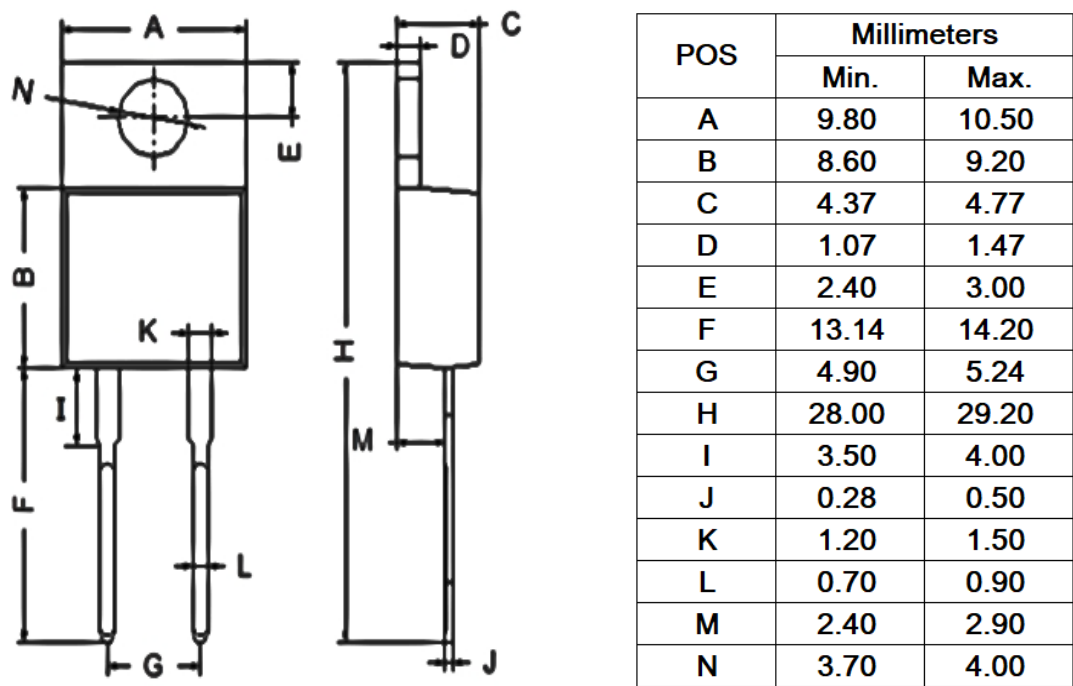


Fig 8: Transient Thermal Impandance




Mechanical Dimensions:



Contact Information

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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.

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