

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
$I_F (T_C 153^{\circ}C)$	20 A
$V_F (T_j 25^{\circ}C)$	1.4 V

Features

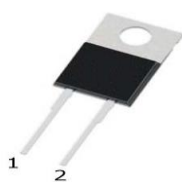
- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_C
- Highly rugged due to better surge current
- Industrial standard quality and reliability



Applications

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

TO-220-2



Equivalent circuit



Package Marking and Ordering Information

Part #	Marking	Package
T1D20120A	1D20120A	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 $T_C = 25^{\circ}\text{C}$ $T_C = 135^{\circ}\text{C}$ $T_C = 153^{\circ}\text{C}$	I_F	54 27 20	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}	86 58	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}	160 130	A
i^2dt value $T_C = 25^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_C = 110^{\circ}\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	$\int i^2 dt$	128 84	A^2s
Power dissipation $T_C = 25^{\circ}\text{C}$ $T_C = 110^{\circ}\text{C}$	P_{tot}	214 93	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}	0.7	$^{\circ}\text{C/W}$

Electrical Characteristic (at T_c = 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 =20A T _j =25°C T _j =175°C
Reverse Current	I _R	-	-	200	μA	V _R =1200V T _j =25°C T _j =175°C
Total Capacitive Charge	Q _C	-	97	-	nC	V _R =800V, T _j =25°C $Q_C = \int_0^{V_R} C(V) dV$
Total Capacitance	C	-	1318	-	pF	T _j =25°C, f=1MHz V _R =0V V _R =400V V _R =800V

Characteristics Curve:

Fig 1: Forward Characteristics

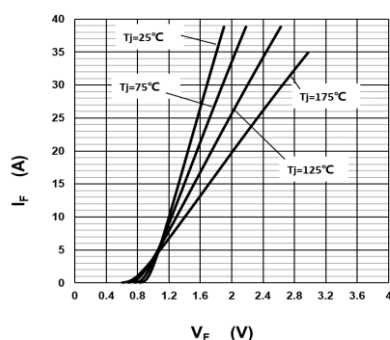


Fig 2: Reverse Characteristics

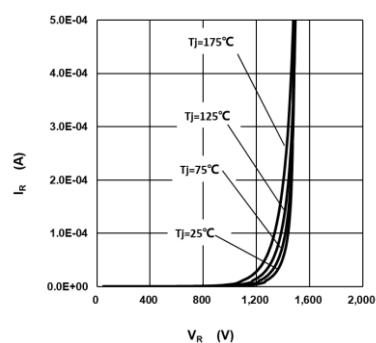


Fig 3: Current Derating

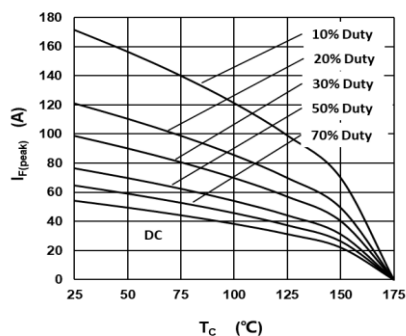


Fig 4: Power Derating

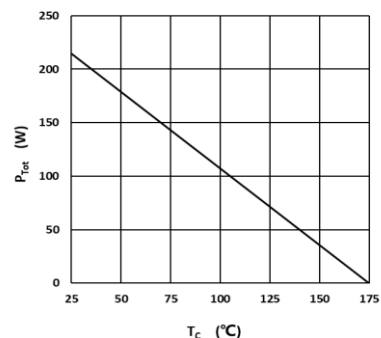


Fig 5: Capacitance vs. Reverse Voltage

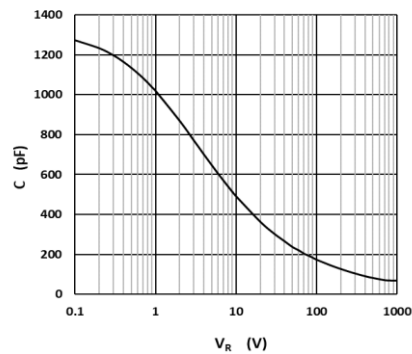


Fig 6: Reverse Charge vs. Reverse Voltage

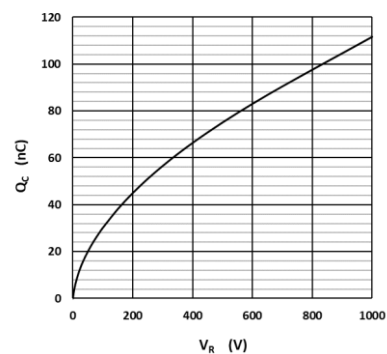


Fig 7: Typical Capacitance Stored Energy

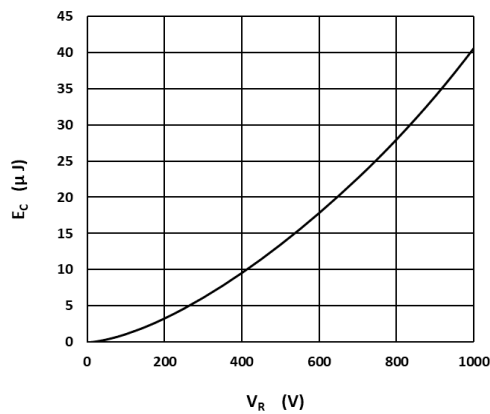
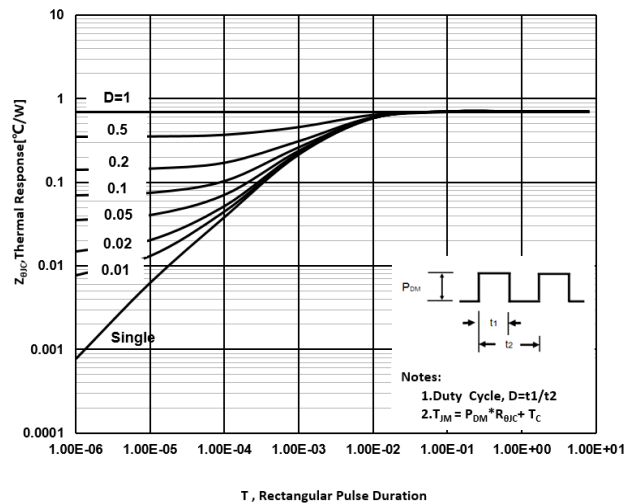
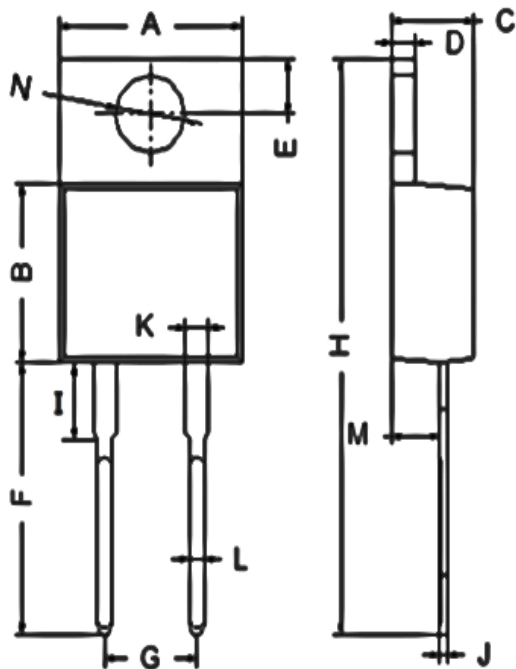


Fig 8: Transient Thermal Impandance



Mechanical Dimensions:



POS	Millimeters	
	Min.	Max.
A	9.80	10.50
B	8.60	9.20
C	4.37	4.77
D	1.07	1.47
E	2.40	3.00
F	13.14	14.20
G	4.90	5.24
H	28.00	29.20
I	3.50	4.00
J	0.28	0.50
K	1.20	1.50
L	0.70	0.90
M	2.40	2.90
N	3.70	4.00

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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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.

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5 / 5