



Schottky Barrier Rectifier

Qualified per MIL-PRF-19500/553

Qualified Levels:
JAN, JANTX, JANTXV
and JANS

DESCRIPTION

This schottky barrier diode provides low forward voltage and offers military grade qualifications for high-reliability applications. This rugged DO-203AA rectifier is applicable for freewheeling diodes, rectification in high-frequency, low-voltage inverters, and for polarity protection.

Important: For the latest information, visit our website <http://www.microsemi.com>.

FEATURES

- Internal solder bond construction.
- Hermetically sealed (welded).
- 600 Amps surge rating.
- JAN, JANTX, JANTXV and JANS qualifications are available per MIL-PRF-19500/553.
- RoHS compliant devices available by adding "e3" suffix (commercial grade only).

APPLICATIONS / BENEFITS

- Metal and glass construction.
- Reverse energy tested.
- Fast recovery.

MAXIMUM RATINGS @ $T_A = +25^\circ\text{C}$ unless otherwise stated

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J and T_{STG}	-55 to +175	$^\circ\text{C}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$
Reverse Voltage, Repetitive Peak and Working Peak Reverse Voltage ⁽¹⁾	V_{RRM} and V_{RWM}	45	V
Reverse Voltage, Nonrepetitive Peak	V_{RSM}	54	V
Reverse Voltage ⁽¹⁾	V_R	45	V
Forward Surge Current @ 8.3 ms half-sine wave	I_{FSM}	600	A
Average Forward Current 50% duty cycle square wave @ $T_C = +125^\circ\text{C}$ ⁽²⁾	I_{FM}	25	A
Average Rectified Output Current @ $T_C = +125^\circ\text{C}$ ⁽³⁾	I_O	22.5	A
Solder Pad Temperature @ 10 s		260	$^\circ\text{C}$

- NOTES:**
1. Full rated V_{RRM} and V_{RWM} with 50% duty cycle is applicable over the range of $T_C = -55^\circ\text{C}$ to $+165^\circ\text{C}$ for $I_{FM} = 0$. Full rated continuous V_R (dc) is applicable over the temperature range of $T_C = -55$ to $+155^\circ\text{C}$. When $V_R = 45$ V and $T_C = +155^\circ\text{C}$, then $T_J = 175^\circ\text{C}$.
 2. Average current with a 50 percent duty cycle square wave including reverse amplitude equal to the magnitude of full rated V_{RWM} . Derate linearly at $0.625\text{ A}/^\circ\text{C}$ for $T_C > +125^\circ\text{C}$.
 3. Average current with an applied half-sine wave peak voltage value equal to the magnitude of full rated V_{RWM} . For temperature-current derating curves, see [Figure 4](#).



**DO-203AA (DO-4)
Package**

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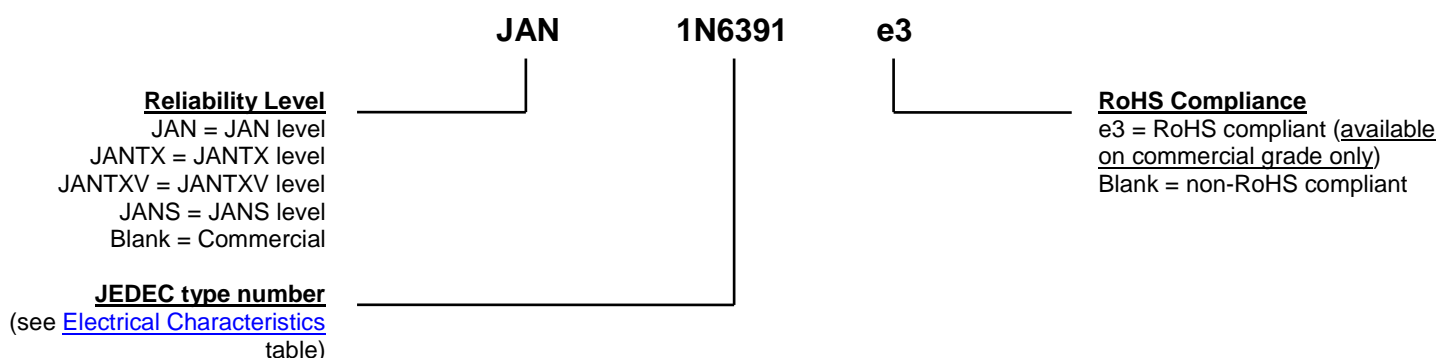
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MECHANICAL and PACKAGING

- CASE: Industry standard DO-4, (DO-203AA), 7/16" hex, stud with 10-32 threads, welded, hermetically sealed metal and glass.
- TERMINALS: Tin-lead plated or RoHS compliant matte-tin plating (commercial grade only) on nickel.
- POLARITY: Cathode to stud.
- MOUNTING HARDWARE: Nut, flat steel washer and lock washer available upon request.
- WEIGHT: Approximately 7.5 grams.
- See [Package Dimensions](#) on last page.

PART NOMENCLATURE

SYMBOLS & DEFINITIONS

Symbol	Definition
f	Frequency
I_{FM}	Forward Current: The current flowing from the external circuit into the anode terminal. Also see first page ratings and test conditions for I_{FM} with 50% duty cycle square wave.
I_{FSM}	Surge Peak Forward Current: The forward current including all nonrepetitive transient currents but excluding all repetitive transients (ref JESD282-B).
I_O	Average Rectified Forward Current: The output current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
V_{FM}	Maximum Forward Voltage
V_R	Reverse Voltage: A positive dc cathode-anode voltage below the breakdown region.
V_{RRM}	Repetitive Peak Reverse Voltage: The peak reverse voltage including all repetitive transient voltages but excluding all non-repetitive transient voltages.
V_{RSM}	Non-Repetitive Peak Inverse Voltage: The peak reverse voltage including all non-repetitive transient voltages but excluding all repetitive transient voltages.
V_{RWM}	Working Peak Reverse Voltage: The peak voltage excluding all transient voltages (ref JESD282-B). Also sometimes known historically as PIV.

ELECTRICAL CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Typ.	Unit
Forward Voltage $I_{FM} = 50 \text{ A}$, $T_C = 25 \text{ }^\circ\text{C}$ * $I_{FM} = 5 \text{ A}$, $T_C = 25 \text{ }^\circ\text{C}$ *	V_{FM}		0.68 0.50		V
Reverse Current Leakage $V_{RM} = 45 \text{ V}$, $T_J = 25 \text{ }^\circ\text{C}$ $V_{RM} = 45 \text{ V}$, $T_J = 175 \text{ }^\circ\text{C}$ * $V_{RM} = 45 \text{ V}$, $T_J = 125 \text{ }^\circ\text{C}$ * $V_{RM} = 45 \text{ V}$, $T_C = -55 \text{ }^\circ\text{C}$ *	I_{RM}		1.5 220 40 1.5		mA
Junction Capacitance $V_R = 5 \text{ V}$, $f = 1 \text{ MHz}$, $100 \text{ KHz} \leq f \leq 1 \text{ MHz}$	C_J		2000		pF

*Pulse test: pulse width 300 μsec , duty cycle 2%

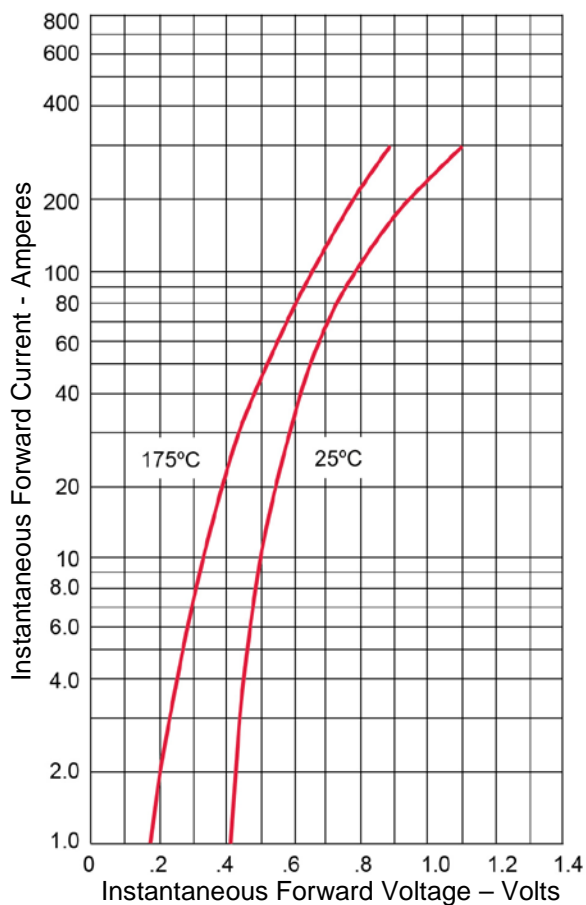
GRAPHS


FIGURE 1
Typical Forward Characteristics

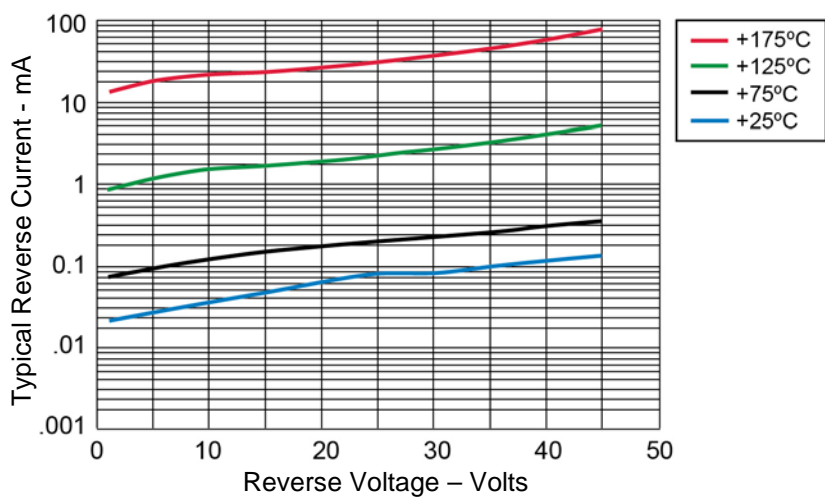


FIGURE 2
Typical Reverse Characteristics

GRAPHS

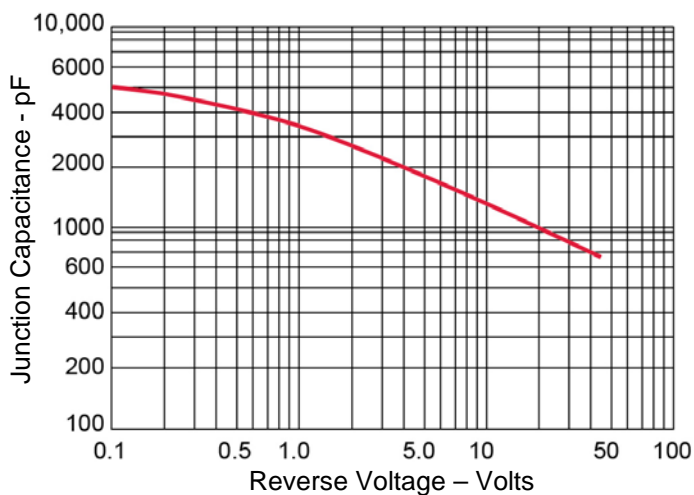


FIGURE 3
Typical Junction Capacitance

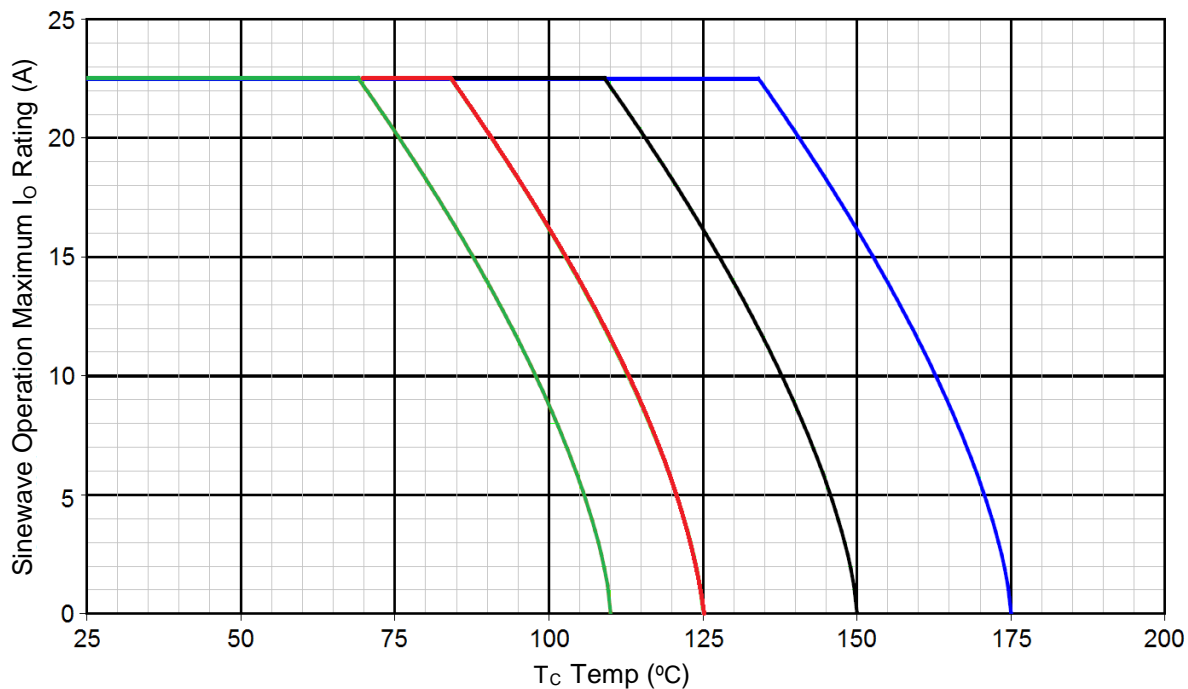
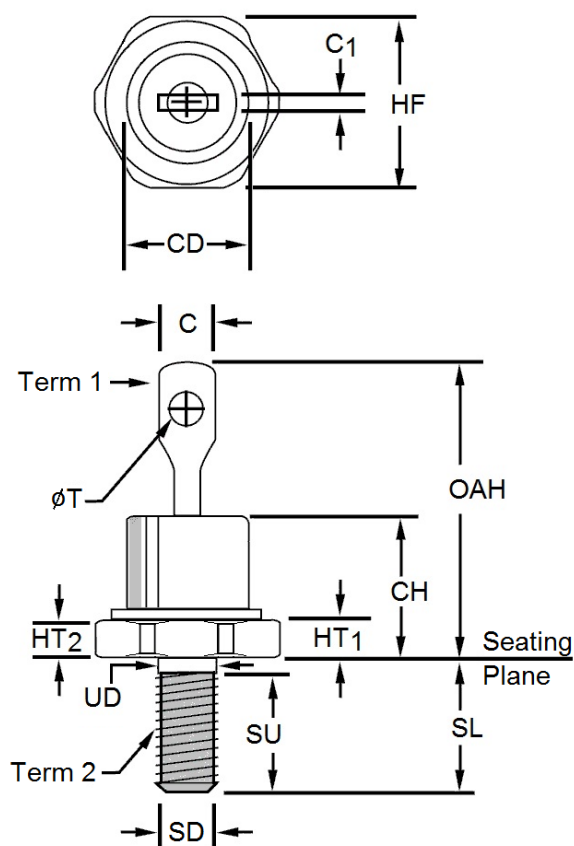


FIGURE 4
Temperature – Current Derating Curve
(Derate design curve constrained by the maximum rated junction temperature ($T_J \leq 175^\circ\text{C}$) and current rating specified.)

PACKAGE DIMENSIONS


Ltr	Dimensions				Notes
	Inch		Millimeters		
	Min	Max	Min	Max	
C		.250		6.35	5
C ₁	0.018	0.65	0.46	1.65	5
CD	0.265	0.424	6.73	10.77	6
CH	0.300	0.405	7.62	10.29	
HF	0.403	0.437	10.24	11.1	6
HT ₁	0.075	0.175	1.91	4.45	7
HT ₂	0.060	-	1.53	-	7
OAH	0.600	0.800	15.24	20.32	
SD					2
SL	0.422	0.453	10.72	11.51	
SU		0.078		1.98	8
UD	0.163	0.189	4.14	4.80	
ΦT	0.060	0.095	1.52	2.41	

NOTES:

1. Dimensions are in inches. Millimeters are given for information only.
2. See "[mechanical and packaging](#)" for the polarity of the terminals.
3. Threads shall be 10-32 UNF-2A in accordance with FED-STD-H28. Maximum pitch diameter (SD) of plated threads shall be basic pitch diameter 0.1697 inch (4.31 mm).
4. Device shall not be damaged by a torque of 15 inch-pounds applied to a 10-32 UNF-2B nut assembled on thread.
5. The angular orientation and peripheral configuration of terminal 1 is undefined, however, the major surfaces over dimension C and C₁ shall be flat.
6. Dimension CD cannot exceed dimension HF.
7. A chamfer or undercut on one or both ends of the hex portion is optional; minimum base diameter at seating plane 0.403 inch (10.24 mm).
8. Length of incomplete or undercut threads UD.
9. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

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