RoHS
Available on commercial versions

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.

DO-203AA (DO-4) Package

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 ºC unless otherwise stated

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J and T_{STG}	-55 to +175	°C
Thermal Resistance Junction-to-Case	$R_{\Theta JC}$	2.0	°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 ºC (2)	I_{FM}	25	A
Average Rectified Output Current @ T_C = +125 ºC (3)	I_O	22.5	A
Solder Pad Temperature @ 10 s		260	ºC

NOTES:
1. Full rated V_{RRM} and V_{RWM} with 50% duty cycle is applicable over the range of T_C = –55 °C to +165 °C for I_{FM} = 0. Full rated continuous V_R (dc) is applicable over the temperature range of T_C = –55 to +155 °C. When V_R = 45 V and T_C = +155 °C, then T_J = 175 °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 A/°C for T_C > +125 °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.

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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 A, T_C = 25 °C * I_{FM} = 5 A, T_C = 25 °C *	V_{FM}		0.68 0.50		V
Reverse Current Leakage V_{RM} = 45 V, T_J = 25 °C V_{RM} = 45 V, T_J = 175 °C * V_{RM} = 45 V, T_J = 125 °C * V_{RM} = 45 V, T_C = -55 °C *	I_{RM}		1.5 220 40 1.5		mA
Junction Capacitance V_R = 5 V, f = 1 MHz, 100 KHz ≤ f ≤ 1 MHz	C_J		2000		pF

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

GRAPHS

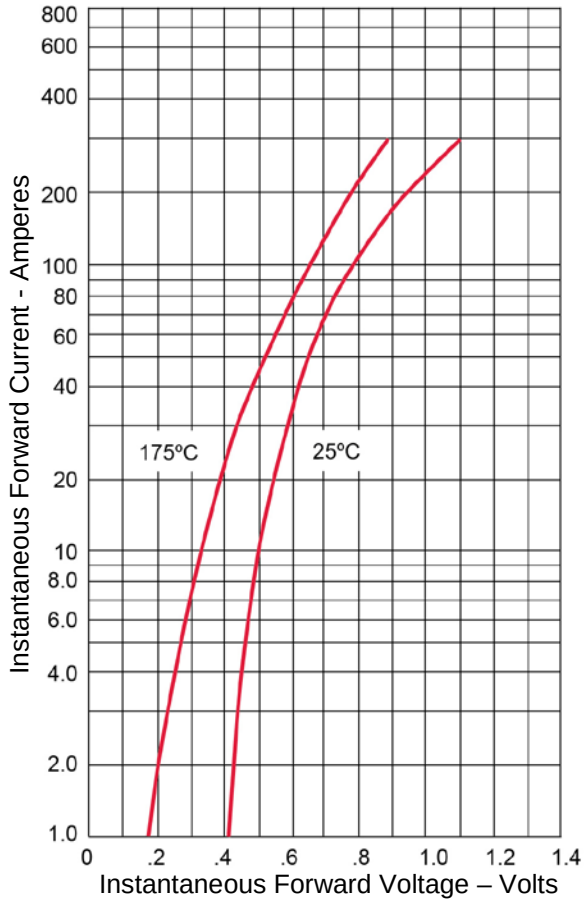


FIGURE 1
Typical Forward Characteristics

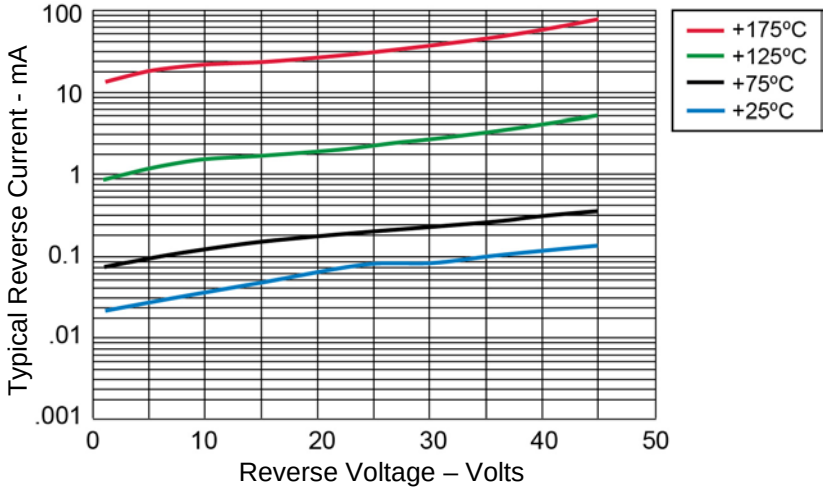


FIGURE 2
Typical Reverse Characteristics

GRAPHS

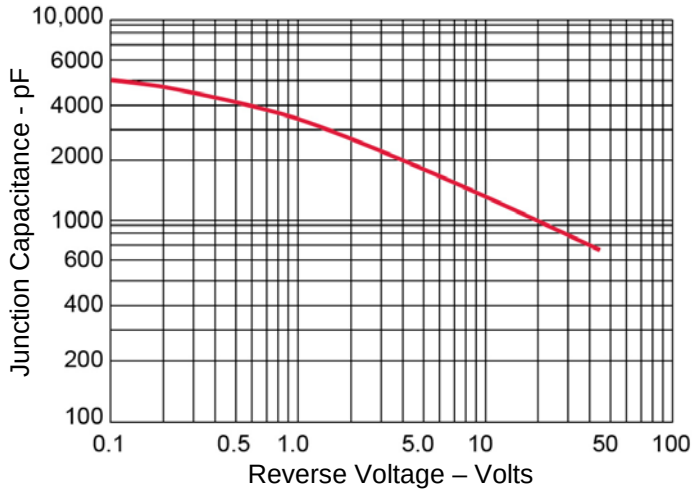


FIGURE 3
Typical Junction Capacitance

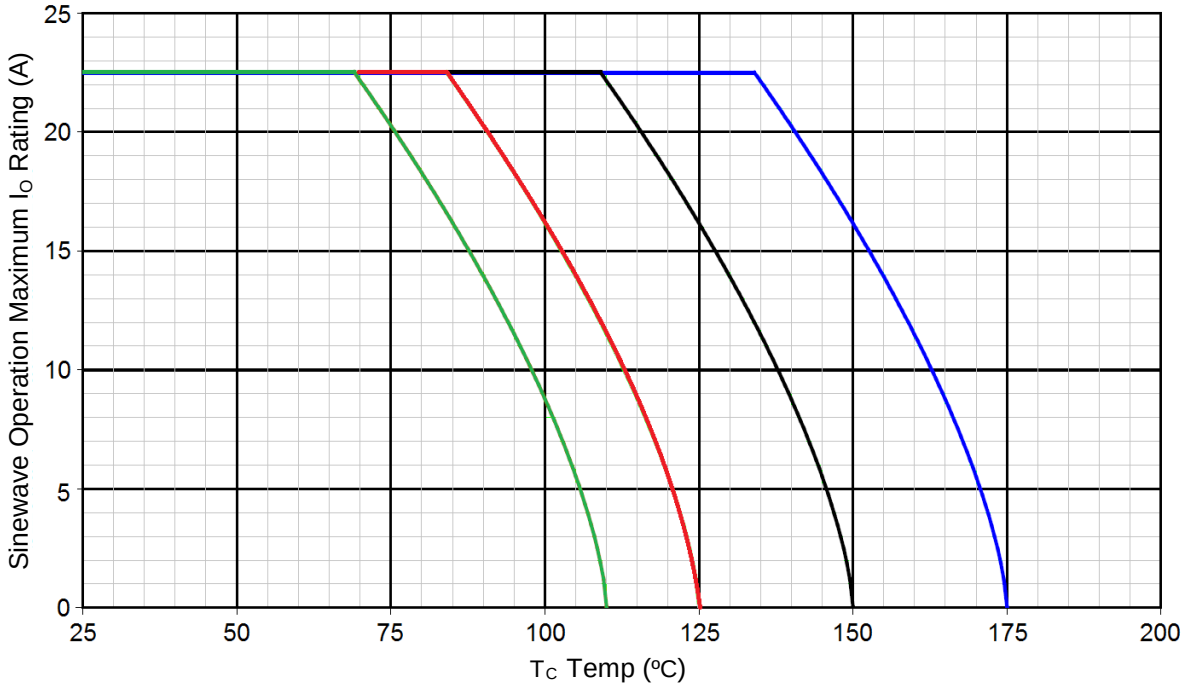
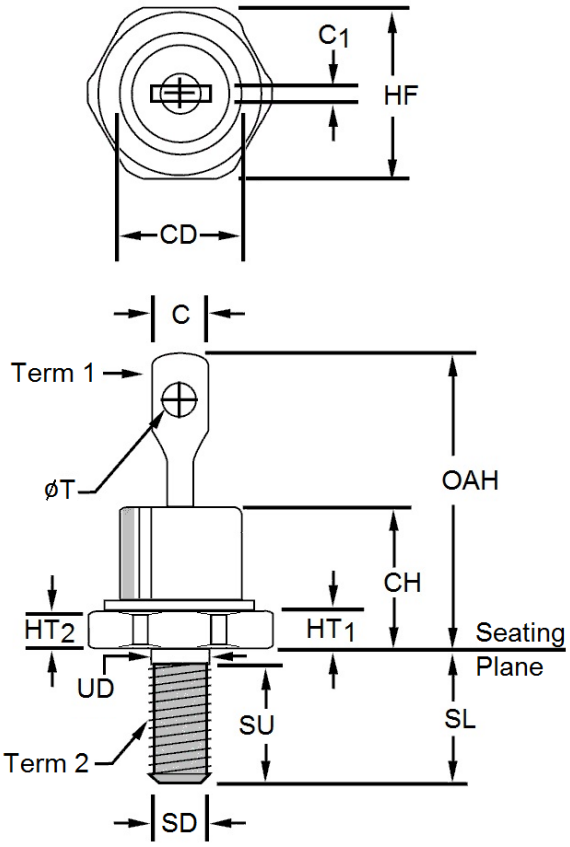


FIGURE 4
Temperature – Current Derating Curve
(Derate design curve constrained by the maximum rated junction temperature (TJ ≤ 175C) and current rating specified.)

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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