



## High Reliability Silicon Power Rectifier

**Qualified per MIL-PRF-19500/297**

Qualified Levels:  
JAN, JANTX, and  
JANTXV

### DESCRIPTION

This series of silicon power rectifier part numbers are qualified up to the JANTXV level for high reliability applications. They are constructed with glass passivated die and feature glass to metal seal construction. They have a 500 amp surge rating and provide a  $V_{RWM}$  up to 1000 volts.

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

### FEATURES

- High continuous current rating.
- Very low forward voltage.
- Low thermal resistance.
- JAN, JANTX and JANTXV qualifications are available per MIL-PRF-19500/297.
- RoHS compliant devices available (commercial grade only).

### APPLICATIONS / BENEFITS

- High frequency switching circuits.
- Mechanically rugged DO-5 package.

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

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	$T_J$ and $T_{STG}$	-65 to +175	$^\circ\text{C}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.8	$^\circ\text{C/W}$
Working Peak Reverse Voltage	$V_{RWM}$	100 200 400 600 800 1000	V
		1N1184(R) 1N1186(R) 1N1188(R) 1N1190(R) 1N3766(R) 1N3768(R)	
Maximum Average DC Output Current @ $T_C = 150^\circ\text{C}$ <sup>(1)</sup>	$I_O$	35	A
Non-Repetitive Sinusoidal Surge Current @ 1/120 s, $T_C = 150^\circ\text{C}$	$I_{FSM}$	500	A

**NOTE:** 1. Derate linearly 1.4 A  $^\circ\text{C}$  between  $T_C = 150^\circ\text{C}$  to  $T_C = 175^\circ\text{C}$ .



**DO-5 (DO-203AB)  
Package**

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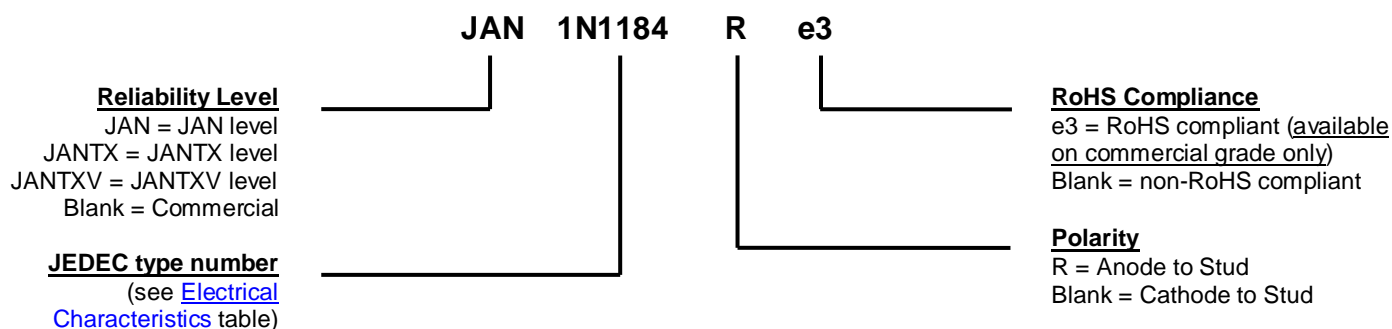
#### **Website:**

[www.microsemi.com](http://www.microsemi.com)

### MECHANICAL and PACKAGING

- CASE: Hermetically sealed metal and glass case body.
- TERMINALS: Hot solder dip (Sn63/Pb37) on standard commercial, JAN, JANTX, and JANTXV levels. RoHS compliant matte-tin on nickel is available on commercial grade only.
- MARKING: Polarity symbol and part number.
- POLARITY: Standard polarity devices are cathode to stud. Reverse polarity devices are anode to stud.
- WEIGHT: Approximately 14 grams.
- See [Package Dimensions](#) on last page.

### PART NOMENCLATURE



### SYMBOLS & DEFINITIONS

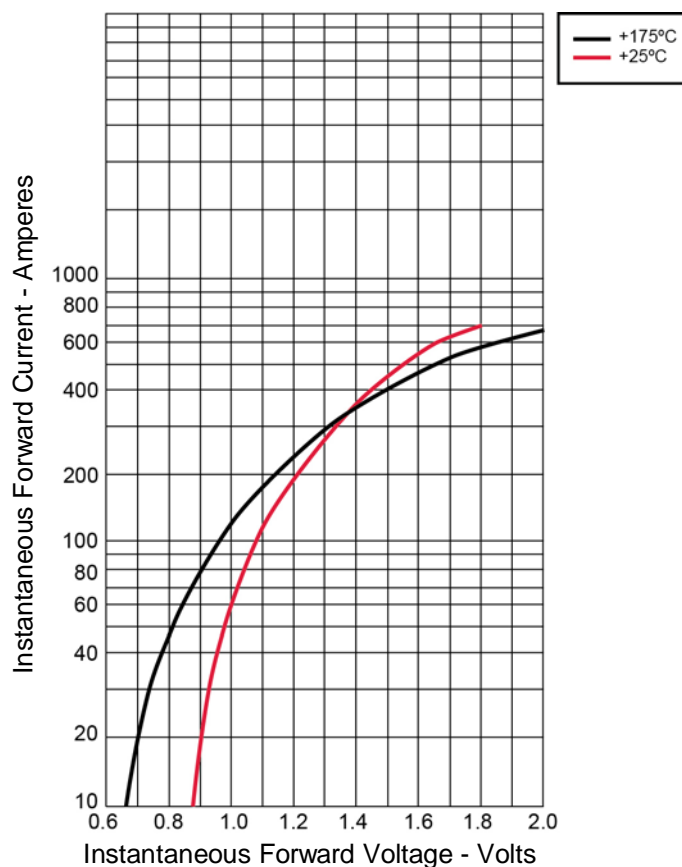
Symbol	Definition
$I_F$	Forward Current: The forward current dc value, no alternating component.
$I_{FSM}$	Maximum Forward Surge Current: The forward current, surge peak or rated forward surge current.
$I_o$	Average Rectified Output Current: The output current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
$I_R$	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
$V_F$	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
$V_{RWM}$	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range excluding all transient voltages (ref JESD282-B). Also sometimes known as PIV.

**ELECTRICAL CHARACTERISTICS**

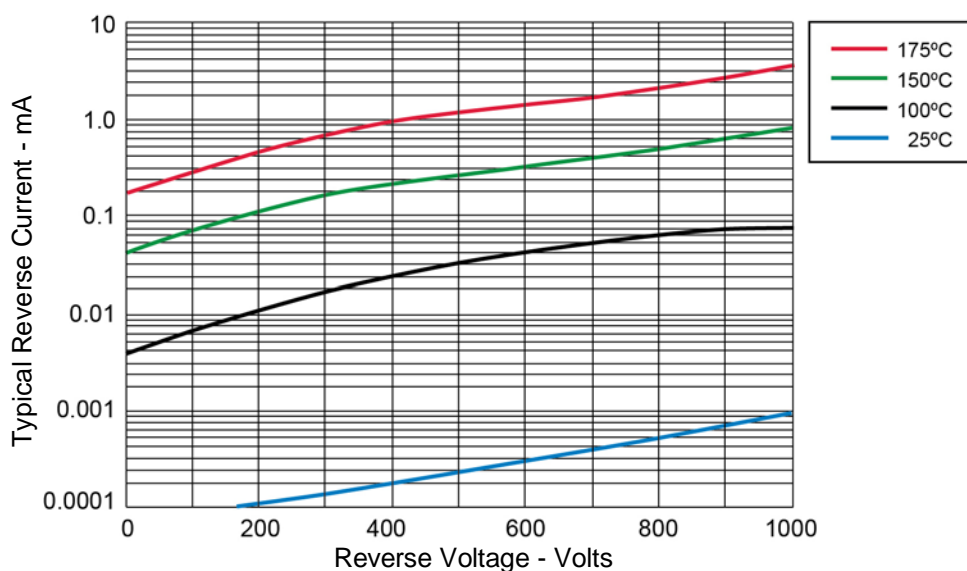
Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Forward Voltage $I_F = 110 \text{ A}$ , $T_C = 25 \text{ }^\circ\text{C}$ <sup>(1)</sup>	$V_F$		1.4	V
Forward Voltage $I_F = 500 \text{ A}$ , $T_C = 150 \text{ }^\circ\text{C}$ <sup>(2)</sup>	$V_F$		2.3	V
Reverse Current $V_{RWM} = 100 \text{ V}$ , $T_J = 25 \text{ }^\circ\text{C}$ 1N1184(R) $V_{RWM} = 200 \text{ V}$ , $T_J = 25 \text{ }^\circ\text{C}$ 1N1186(R) $V_{RWM} = 400 \text{ V}$ , $T_J = 25 \text{ }^\circ\text{C}$ 1N1188(R) $V_{RWM} = 600 \text{ V}$ , $T_J = 25 \text{ }^\circ\text{C}$ 1N1190(R) $V_{RWM} = 800 \text{ V}$ , $T_J = 25 \text{ }^\circ\text{C}$ 1N3766(R) $V_{RWM} = 1000 \text{ V}$ , $T_J = 25 \text{ }^\circ\text{C}$ 1N3768(R)	$I_R$		10	$\mu\text{A}$
Reverse Current $V_{RWM} = 100 \text{ V}$ , $T_J = 150 \text{ }^\circ\text{C}$ 1N1184(R) $V_{RWM} = 200 \text{ V}$ , $T_J = 150 \text{ }^\circ\text{C}$ 1N1186(R) $V_{RWM} = 400 \text{ V}$ , $T_J = 150 \text{ }^\circ\text{C}$ 1N1188(R) $V_{RWM} = 600 \text{ V}$ , $T_J = 150 \text{ }^\circ\text{C}$ 1N1190(R) $V_{RWM} = 800 \text{ V}$ , $T_{Jj} = 150 \text{ }^\circ\text{C}$ 1N3766(R) $V_{RWM} = 1000 \text{ V}$ , $T_J = 150 \text{ }^\circ\text{C}$ 1N3768(R)	$I_R$		1	mA

**NOTES:**

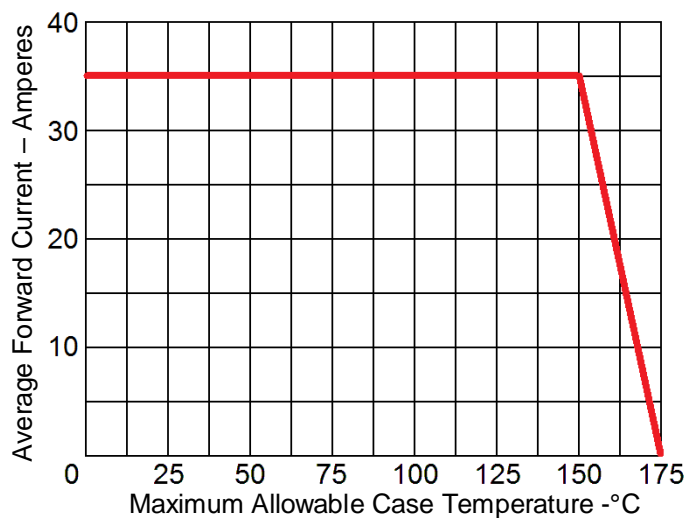
- $t_p < 8.3 \text{ ms}$ , duty cycle  $\leq 2$  percent pulse.
- VF1 shall be performed with either  $t_p = 800 \text{ } \mu\text{s}$  or  $t_p = 8.3 \text{ ms}$ .

**GRAPHS**


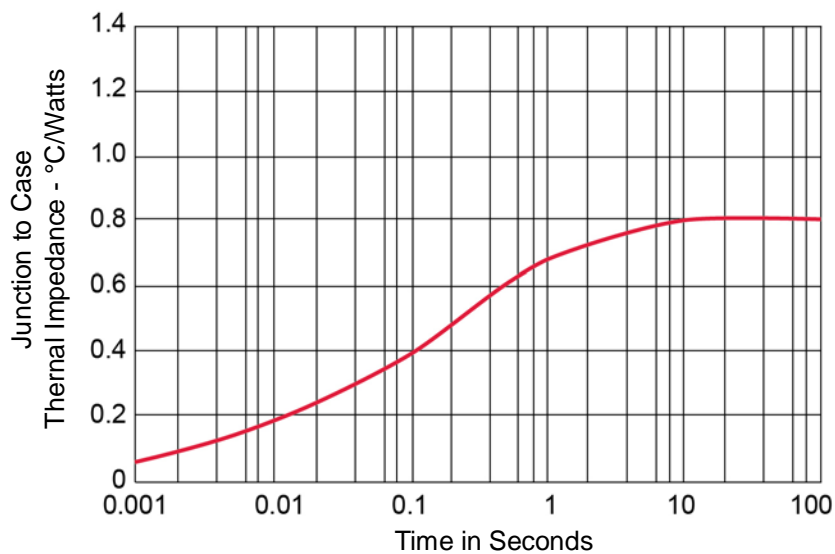
**FIGURE 1**  
Typical Forward Characteristics



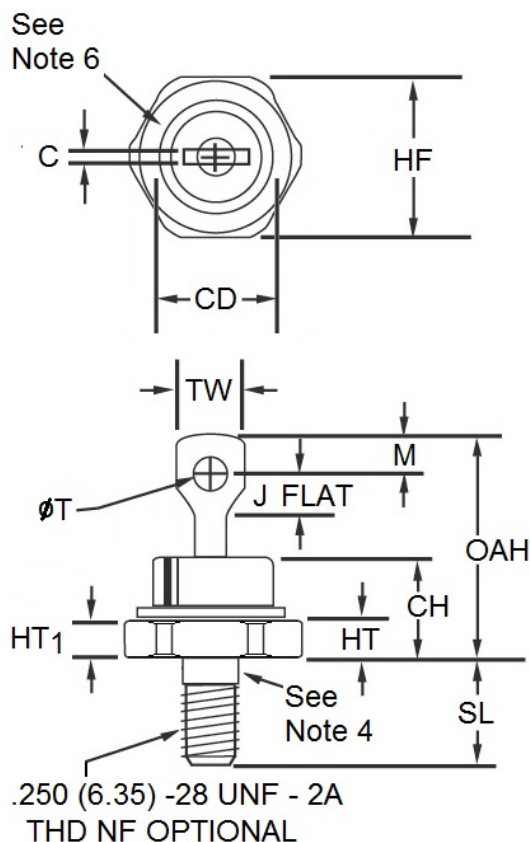
**FIGURE 2**  
Typical Reverse Characteristics

**GRAPHS (continued)**


**FIGURE 3**  
Forward Current Derating



**FIGURE 4**  
Transient Thermal Impedance

**PACKAGE DIMENSIONS**


Ltr	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
OAH	-	1.000	-	25.40
CH	-	0.450	-	11.43
HT	0.115	0.200	2.93	5.08
SL	0.422	0.453	10.72	11.50
HT1	0.060	-	1.53	-
B	0.250	0.375	6.35	9.52
CD	-	0.667	-	16.94
HF	0.667	0.687	16.95	17.44
J	0.156	-	3.97	-
$\phi T$	0.140	0.175	3.56	4.44
C	-	0.080	-	2.03
M	0.030	-	0.77	-

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Units must not be damaged by torque of 30 inch-pounds applied to 0.250-28 UNF-28 nut assembled on thread.
4. Diameter of unthreaded portion 0.249 inch (6.32 mm) max and .220 inch (5.59 mm) min.
5. Complete threads to extend to within 2.5 threads of seating plane.
6. Angular orientation of this terminal is undefined.
7. Max pitch diameter of plated threads shall be basic pitch diameter 0.2268 inch (5.76 mm) reference FED-STD-H28.
8. A chamfer or undercut on one or both ends of the hex portion is optional; minimum base diameter at seating plane. 0.600 inch (15.24 mm).
9. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi x$  symbology.