

# INTERNATIONAL RECTIFIER

## 1N1199A, 1N3670A SERIES

### 12 Amp Medium Power Silicon Rectifier Diodes

#### Major Ratings and Characteristics

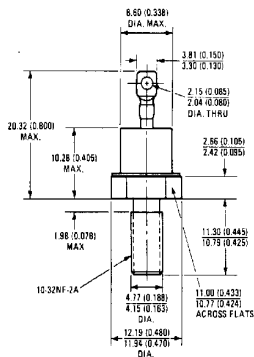
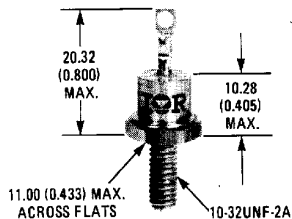
Series	1N1199A 1N3670A	Units
$I_F$ (AV)	12*	A
@ MAX. $T_C$	150*	°C
$I_{FSM}$	@ 50 Hz	A
	@ 60 Hz	
$I_{T1}$	@ 50 Hz	A <sup>2</sup> s
	@ 60 Hz	
$T_C$	-65°C* to 200°C	°C
$V_{RRM}$ range	50* - 1000*	V

\*JEDEC registered value.

#### Description/Features

- Voltage ratings from 50 to 1,000 volts
- High surge capability
- Low thermal impedance
- High temperature rating
- Can be supplied as JAN and JAN-TX devices in accordance with MIL-S-19500/260

#### CASE STYLE AND DIMENSIONS



Conforms to JEDEC Outline DO-203AA (DO-4)

All Dimensions in Millimeters and (Inches)

## VOLTAGE RATINGS

Part Number <sup>①</sup>	$V_{RRM}$ – Max. Repetitive Peak Reverse Voltage (V) $T_C = -65^\circ\text{C to } 200^\circ\text{C}$	$V_{R(RMS)}$ – Max. RMS Reverse Voltage (V) $T_C = -65^\circ\text{C to } 200^\circ\text{C}$	$V_{RSM}$ – Max. Non-Repetitive Peak Reverse Voltage (V) $T_C = 0^\circ\text{C to } 200^\circ\text{C}$	$V_R$ – Max. Direct Reverse Voltage (V) $T_C = -65^\circ\text{C to } 200^\circ\text{C}$
1N1199A	50*	35*	100*	50*
1N1200A	100*	70*	200*	100*
1N1201A	150*	105*	300*	150*
1N1202A	200*	140*	350*	200*
1N1203A	300*	210*	450*	300*
1N1204A	400*	280*	600*	400*
1N1205A	500*	350*	700*	500*
1N1206A	600*	420*	800*	600*
1N3670A	700*	490*	900*	700*
1N3671A	800*	560*	1000*	800*
1N3672A	900*	630*	1100*	900*
1N3673A	1000*	700*	1200*	1000*

<sup>①</sup> Basic part number indicates cathode-to-case. For anode-to-case, add "R" to part number, e.g., 1N1199RA.

## ELECTRICAL SPECIFICATIONS

		1N1199A 1N3670A	Units	Conditions	
$I_{F(AV)}$	Max. average forward current	12*	A	180° sinusoidal conduction	
	@ $T_C$ max. =	150*			
$I_{FSM}$	Max. peak one-cycle non-repetitive surge current	230	A	Half cycle 50 Hz sine wave or 6 ms rectangular pulse	
		240*		Half cycle 60 Hz sine wave or 5 ms rectangular pulse	
		275		Half cycle 50 Hz sine wave or 6 ms rectangular pulse	
		285		Half cycle 60 Hz sine wave or 5 ms rectangular pulse	
				Following any rated load condition and with rated $V_{RRM}$ reapplied	
				Following any rated load condition and with $V_{RRM}$ applied following surge = 0	
$I^2t$	Max. $I^2t$ for fusing	260	A <sup>2</sup> s	t = 10ms With rated $V_{RRM}$ applied following surge, initial $T_J = 200^\circ\text{C}$	
		240		t = 6.3ms	
	Max. $I^2t$ for individual device fusing	370	A <sup>2</sup> s	t = 10ms With $V_{RRM} = 0$ following surge, initial $T_J = 200^\circ\text{C}$	
		340		t = 6.3ms	
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for individual device fusing <sup>①</sup>	3715	A <sup>2</sup> $\sqrt{s}$	t = 0.1 to 10ms, $V_{RRM} = 0$ following surge	
$V_{FM}$	Max. peak forward voltage	1.35*	V	$I_{F(AV)} = 12\text{A}$ (36A peak), $T_C = 25^\circ\text{C}$	
$I_{R(AV)}$	Max. average reverse current	$V_{RRM} = 50$	3.0*	mA	Max. rated $I_{F(AV)}$ and $T_C$ Note: Max. peak reverse current, $I_{RM}$ , under same conditions $\approx 2 \times$ rated $I_{R(AV)}$ .
		= 100	2.5*		
		= 150	2.25*		
		= 200	2.0*		
		= 300	1.75*		

\*JEDEC registered value.

<sup>①</sup>  $I^2t$  for time  $t_x = I^2\sqrt{t} \div \sqrt{t_x}$

**ELECTRICAL SPECIFICATIONS (Continued)**

	1N1199A 1N3670A	Units	Conditions
$I_{R(AV)}$ Max. average reverse current (Continued)  $V_{RRM} = 400$	1.5*	mA	Max. rated $I_{F(AV)}$ and $T_C$  Note: Max. peak reverse current, $I_{RM}$ , under same conditions $\approx 2 \times$ rated $I_{R(AV)}$ .
	= 500		
	= 600		
	= 700		
	= 800		
	= 900		
	= 1000		

**THERMAL-MECHANICAL SPECIFICATIONS**

$T_C$	Max. operating case temperature range	-65* to 200*	°C		
$T_{stg}$	Max. storage temperature range	-65* to 200*	°C		
$R_{thJC}$	Max. internal thermal resistance, junction-to-case	2.0*	deg. C/W	DC operation	
$R_{thCS}$	Thermal resistance, case-to-sink	0.5	deg. C/W	Mounting surface flat, smooth, and greased.	
T	Mounting torque	Min.	1.36 (12)	N · m (lbf·in)	Torque applied to nut. Non-lubricated threads.
		Max.	1.69 (15)		
		Min.	1.07 (9.45)		Torque applied to nut. Lubricated threads.
		Max.	1.30 (11.55)		
		Min.	1.17 (10.35)		Torque applied to device case. Lubricated threads.
		Max.	1.43 (12.65)		
wt	Approximate weight	7.0 (0.25)	g (oz.)		
	Case style	DO-203AA (DO-4)		JEDEC	

\*JEDEC registered value.

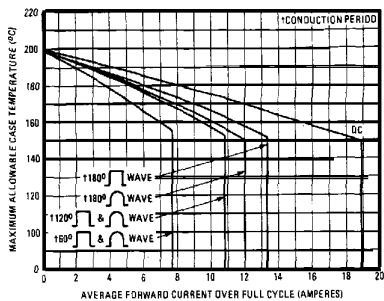


Fig. 1 - Average Forward Current Vs. Maximum Allowable Case Temperature

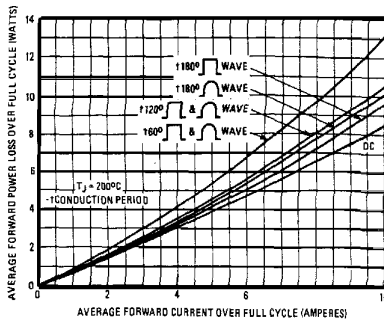


Fig. 2 - Maximum Low Level Forward Power Loss Vs. Average Forward Current

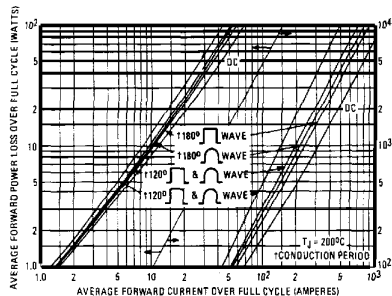


Fig. 3 - Maximum High Level Forward Power Loss Vs. Average Forward Current

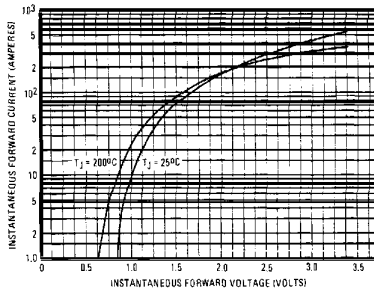


Fig. 4 - Maximum Forward Voltage Vs. Forward Current

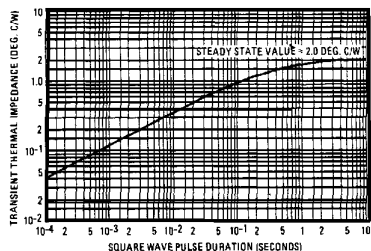


Fig. 5 - Maximum Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration

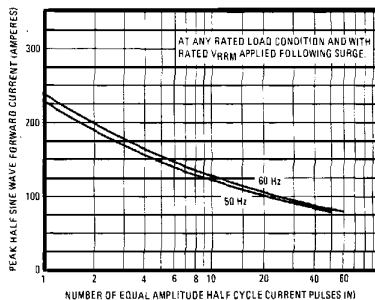


Fig. 6 - Maximum Non-Repetitive 50 Hz Surge Current Vs. Number of Current Pulses