



**THE DATASHEET OF  
VS-1N1204RA**





Medium Power Silicon Rectifier Diodes, (Stud Version), 12 A



DO-4 (DO-203AA)

FEATURES

- Voltage ratings from 50 V to 1000 V
- 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
Package	DO-4 (DO-203AA)
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		<b>12</b>	A
	$T_C$	<b>150</b>	°C
$I_{FSM}$	50 Hz	230	A
	60 Hz	<b>240</b>	
$I^2t$	50 Hz	260	A <sup>2</sup> s
	60 Hz	240	
$T_J$		-65 to +200	°C
$V_{RRM}$	Range	<b>50 to 1000</b>	V

Note

- JEDEC® registered values are in bold

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	$V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE ( $T_C = -65\text{ °C TO }200\text{ °C}$ ) V	$V_{R(RMS)}$ , MAXIMUM RMS REVERSE VOLTAGE ( $T_C = -65\text{ °C TO }200\text{ °C}$ ) V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE ( $T_C = -65\text{ °C TO }200\text{ °C}$ ) V	$V_{RM}$ , MAXIMUM DIRECT REVERSE VOLTAGE ( $T_C = -65\text{ °C TO }200\text{ °C}$ ) V
VS-1N1199A	<b>50</b>	<b>35</b>	<b>100</b>	<b>50</b>
VS-1N1200A	<b>100</b>	<b>70</b>	<b>200</b>	<b>100</b>
VS-1N1201A	<b>150</b>	<b>105</b>	<b>300</b>	<b>150</b>
VS-1N1202A	<b>200</b>	<b>140</b>	<b>350</b>	<b>200</b>
VS-1N1203A	<b>300</b>	<b>210</b>	<b>450</b>	<b>300</b>
VS-1N1204A	<b>400</b>	<b>280</b>	<b>600</b>	<b>400</b>
VS-1N1205A	<b>500</b>	<b>350</b>	<b>700</b>	<b>500</b>
VS-1N1206A	<b>600</b>	<b>420</b>	<b>800</b>	<b>600</b>
VS-1N3670A	<b>700</b>	490	<b>900</b>	<b>700</b>
VS-1N3671A	<b>800</b>	560	<b>1000</b>	<b>800</b>
VS-1N3672A	<b>900</b>	630	<b>1100</b>	<b>900</b>
VS-1N3673A	<b>1000</b>	700	<b>1200</b>	<b>1000</b>
VS-1N3624	<b>1000</b>	1200	<b>1400</b>	<b>1000</b>

Notes

- JEDEC® registered values are in bold
- Basic part number indicates cathode to case; for anode to case, add "R" to part number, e.g., 1N1199RA



FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° sinusoidal conduction		<b>12</b>	A	
				<b>150</b>	°C	
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	Half cycle 50 Hz sine wave or 6 ms rectangular pulse	Following any rated load condition and with rated $V_{RRM}$ applied	230	A	
		Half cycle 60 Hz sine wave or 5 ms rectangular pulse		<b>240</b>		
		Half cycle 50 Hz sine wave or 6 ms rectangular pulse	Following any rated load condition and with $V_{RRM}$ applied following surge = 0 V	275		
		Half cycle 60 Hz sine wave or 5 ms rectangular pulse		285		
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	With rated $V_{RRM}$ applied following surge, initial $T_J = 200\text{ °C}$	260	A <sup>2</sup> s	
		t = 8.3 ms		240		
Maximum $I^2t$ for individual device fusing		t = 10 ms	With $V_{RRM} = 0\text{ V}$ following surge, initial $T_J = 200\text{ °C}$	370		
		t = 8.3 ms		340		
Maximum $I^2\sqrt{t}$ for individual device fusing	$I^2\sqrt{t}$ (1)	t = 0.1 ms to 10 ms, $V_{RRM} = 0\text{ V}$ following surge		3715	A <sup>2</sup> √s	
Maximum forward voltage drop	$V_{FM}$	$I_{F(AV)} = 12\text{ A}$ (38 A peak), $T_C = 25\text{ °C}$		<b>1.35</b>	V	
Maximum average reverse current	$I_{R(AV)}$ (2)	Maximum rated $I_{F(AV)}$ and $T_C$		$V_{RRM} = 50\text{ V}$	mA	
				$V_{RRM} = 100\text{ V}$		<b>3.0</b>
				$V_{RRM} = 150\text{ V}$		<b>2.5</b>
				$V_{RRM} = 200\text{ V}$		<b>2.25</b>
				$V_{RRM} = 300\text{ V}$		<b>2.0</b>
				$V_{RRM} = 400\text{ V}$		<b>1.75</b>
				$V_{RRM} = 500\text{ V}$		<b>1.5</b>
				$V_{RRM} = 600\text{ V}$		<b>1.25</b>
				$V_{RRM} = 700\text{ V}$		<b>1.0</b>
				$V_{RRM} = 800\text{ V}$		<b>0.9</b>
				$V_{RRM} = 900\text{ V}$		<b>0.8</b>
$V_{RRM} = 1000\text{ V}$	<b>0.7</b>					
			<b>0.6</b>			

**Notes**

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- (1)  $I^2t$  for time  $t_x = I^2\sqrt{t} \times \sqrt{t_x}$
- (2) Maximum peak reverse current ( $I_{RM}$ ) under same conditions  $\approx 2 \times$  rated  $I_{R(AV)}$

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum operating case and storage temperature range	$T_C, T_{Stg}$			<b>-65 to 200</b>	°C
Maximum internal thermal resistance, junction to case	$R_{thJC}$	DC operation		<b>2.0</b>	°C/W
Thermal resistance, case to sink	$R_{thCS}$	Mounting surface, smooth, flat and greased		0.5	
Mounting torque	minimum	Torque applied to nut; non-lubricated threads		1.36 (12)	N · m (lbf · in)
	maximum			1.69 (15)	
	minimum	Torque applied to nut; lubricated threads		1.07 (9.45)	
	maximum			1.30 (11.55)	
	minimum	Torque applied to device case; lubricated threads		1.17 (10.35)	
	maximum			1.43 (12.65)	
Approximate weight				7.0	g
				0.25	oz.
Case style		JEDEC®		DO-4 (DO-203AA)	

**Note**

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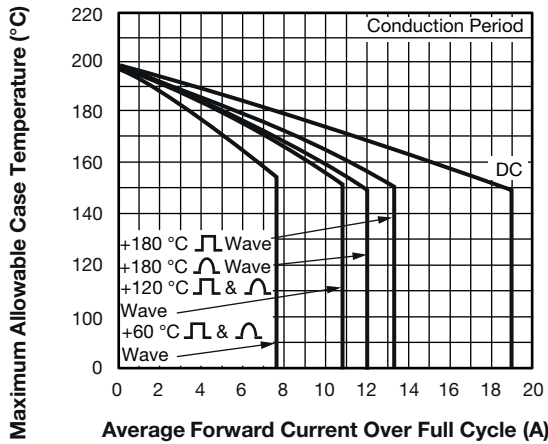


Fig. 1 - Average Forward Current vs. Maximum Allowable Case Temperature

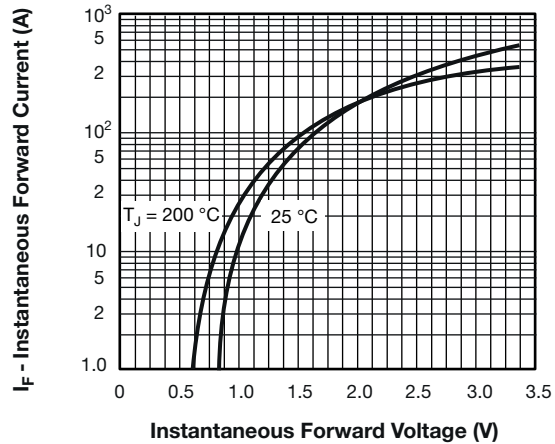


Fig. 4 - Maximum Forward Voltage vs. Forward Current

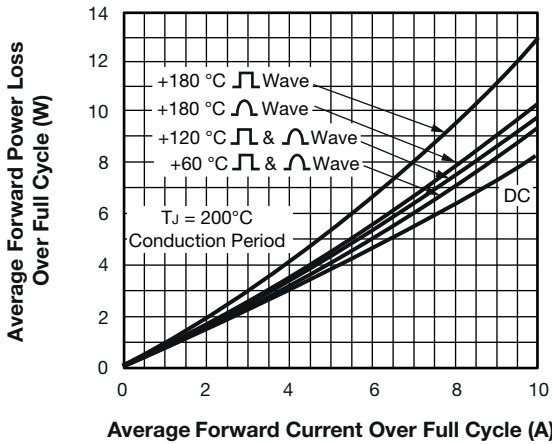


Fig. 2 - Maximum Low Level Forward Power Loss vs. Average Forward Current

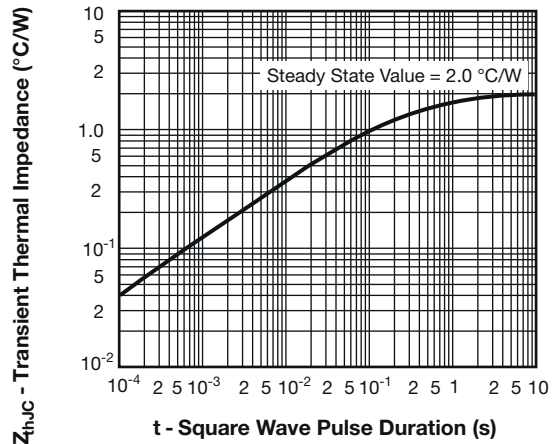


Fig. 5 - Maximum Transient Thermal Impedance, Junction to Case vs. Pulse Duration



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

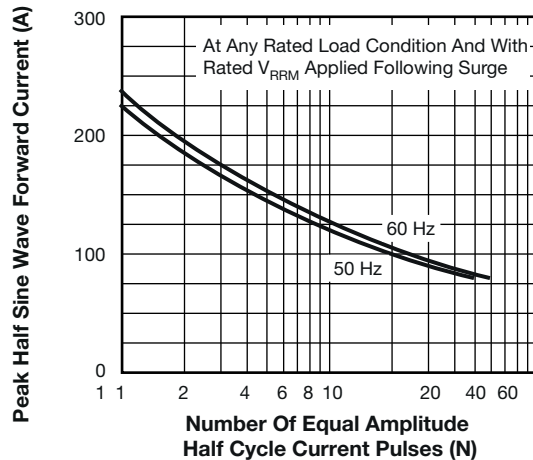


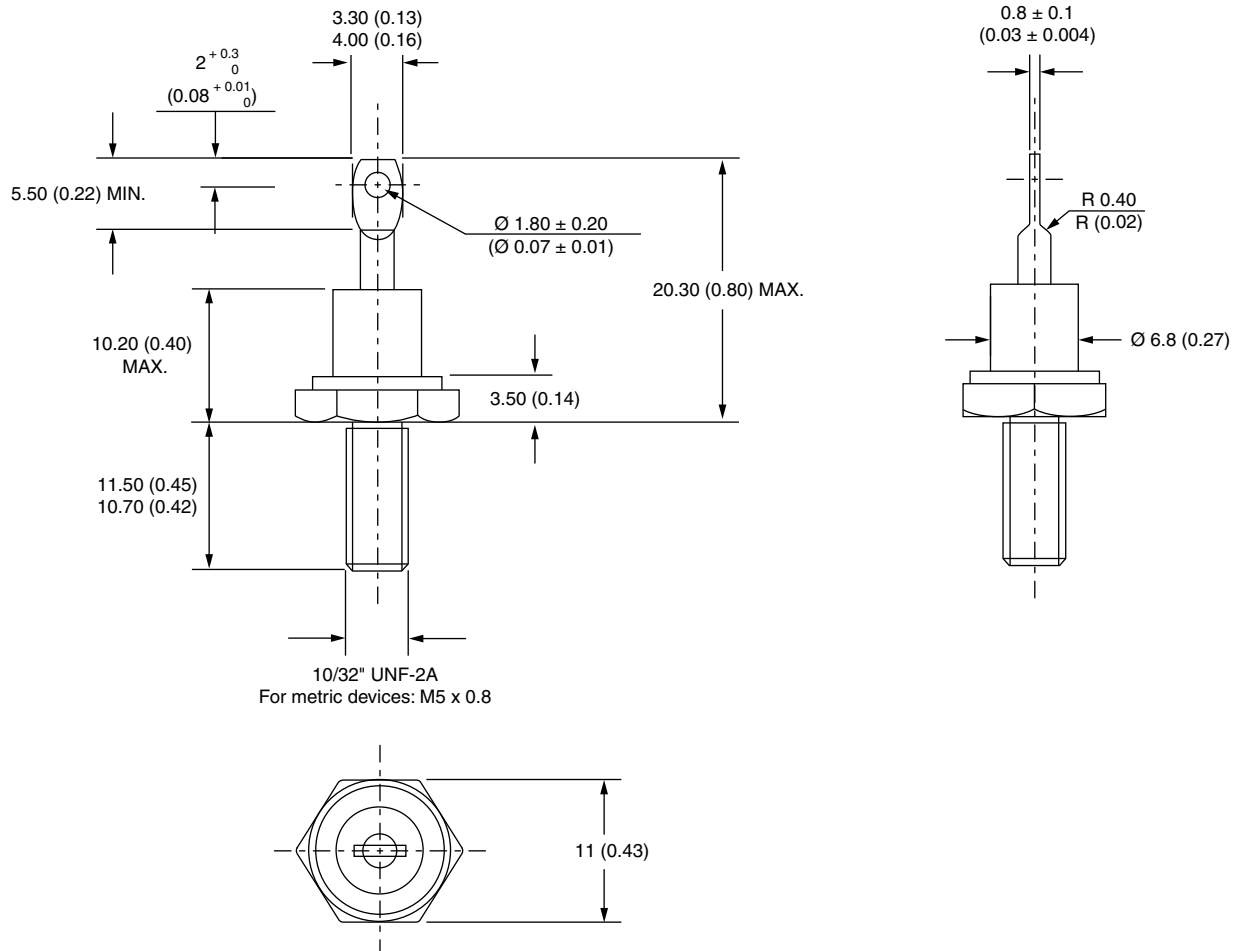
Fig. 6 - Maximum Non-Repetitive 50 Hz Surge Current vs. Number of Current Pulses

LINKS TO RELATED DOCUMENTS

Dimensions	<a href="http://www.vishay.com/doc?95311">www.vishay.com/doc?95311</a>
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## DO-203AA (DO-4)

**DIMENSIONS** in millimeters (inches)





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