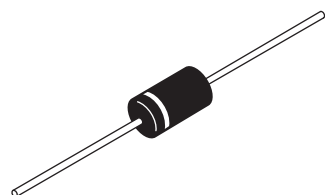




## Schottky Rectifier, 3.0 A



C-16



## FEATURES

- Low profile, axial leaded outline
- High frequency operation
- Very low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified for commercial level
- Halogen-free according to IEC 61249-2-21 definition (-M3 only)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

## PRODUCT SUMMARY

Package	DO-201AD (C-16)
$I_{F(AV)}$	3 A
$V_R$	20 V
$V_F$ at $I_F$	See Electrical table
$I_{RM}$ max.	20 mA at 100 °C
$T_J$ max.	150 °C
Diode variation	Single die
$E_{AS}$	See Electrical table

## DESCRIPTION

The VS-1N5820... axial leaded Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

## MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	3.0	A
$V_{RRM}$		20	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	450	A
$V_F$	3 Apk, $T_J = 25^\circ C$	0.475	V
$T_J$	Range	- 65 to 150	°C

## VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-1N5820	VS-1N5820-M3	UNITS
Maximum DC reverse voltage	$V_R$	20	20	V
Maximum working peak reverse voltage	$V_{RWM}$			

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_L = 114^\circ C$ , rectangular waveform With cooling fins		3.0	A
Maximum peak one cycle non-repetitive surge current at $T_J = 25^\circ C$	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	450	
		10 ms sine or 6 ms rect. pulse		90	

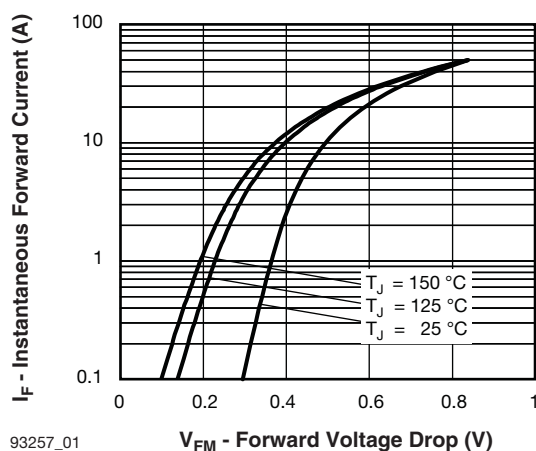


ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS
Maximum forward voltage drop	V <sub>FM</sub> <sup>(1)</sup>	3 A	T <sub>J</sub> = 25 °C	0.41	0.475	V
		9.4 A		0.49	0.85	
Maximum reverse leakage current	I <sub>RM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	V <sub>R</sub> = Rated V <sub>R</sub>	0.05	2.0	mA
		T <sub>J</sub> = 100 °C		8.1	20	
Typical junction capacitance	C <sub>T</sub>	V <sub>R</sub> = 5 V <sub>DC</sub> (test signal range 100 kHz to 1 MHz), 25 °C		350	-	pF
Typical series inductance	L <sub>S</sub>	Measured lead to lead 5 mm from package body		9.0	-	nH
Maximum voltage rate of change	dV/dt	Rated V <sub>R</sub>		-	10 000	V/μs

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

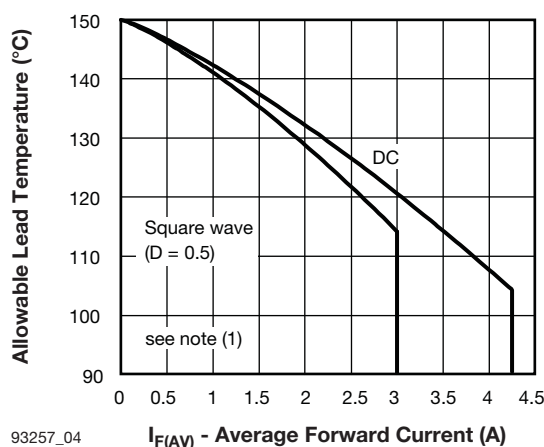
THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	$T_J^{(1)}, T_{Stg}$		- 65 to 150	$^{\circ}\text{C}$
Maximum thermal resistance, junction to lead	$R_{thJL}$	With fin 20 x 20 (0.79 x 0.79) 1.0 thick	34	$^{\circ}\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{thJA}$	DC operation Without cooling fin	80	
Approximate weight			1.2	g
			0.042	oz.
Marking device		Case style C-16	1N5820	

**Note**(1)  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$  thermal runaway condition for a diode on its own heatsink



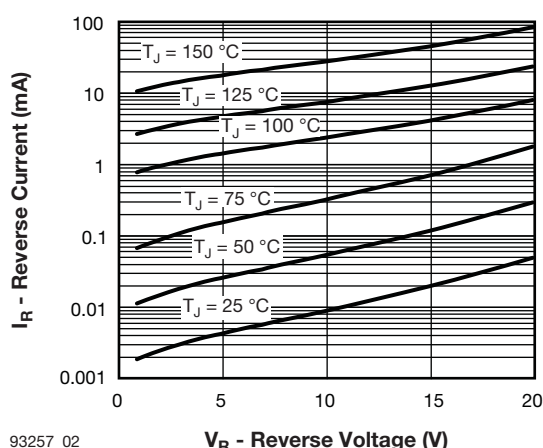
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Fig. 1 - Maximum Forward Voltage Drop Characteristics



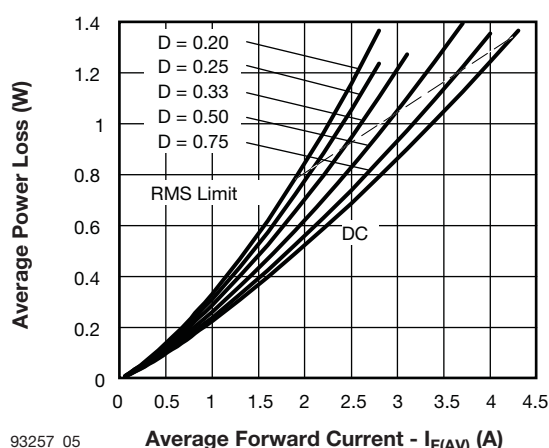
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Fig. 4 - Typical Average Forward Current vs. Allowable Lead Temperature



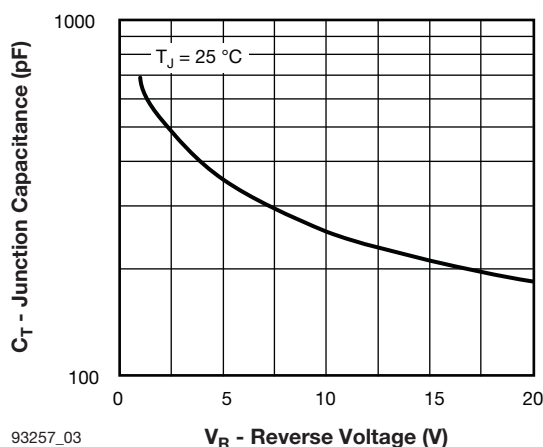
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Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage



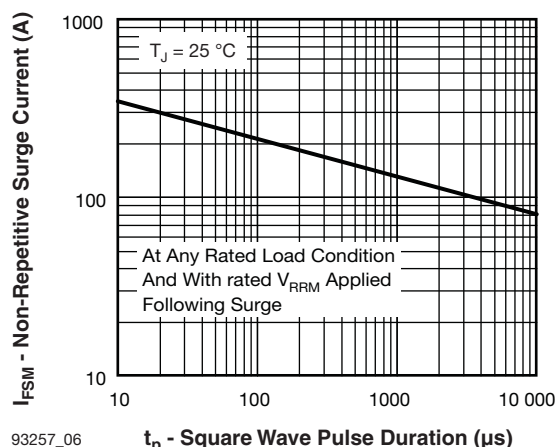
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Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current



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Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



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Fig. 6 - Maximum Peak Surge Forward Current vs. Pulse Duration

## Note

- (1) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$ ;  
 $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  $P_{dREV}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$



## ORDERING INFORMATION TABLE

Device code	VS-	1N5820	TR	-M3
	1	2	3	4

- 1** - Vishay Semiconductors product
- 2** - Part number: 3 A, 20 V
- 3** - TR = Tape and reel package  
None = Bulk package
- 4** - Environmental digit
  - None = Lead (Pb)-free and RoHS compliant
  - -M3 = Halogen-free, RoHS compliant, and terminations lead (Pb)-free

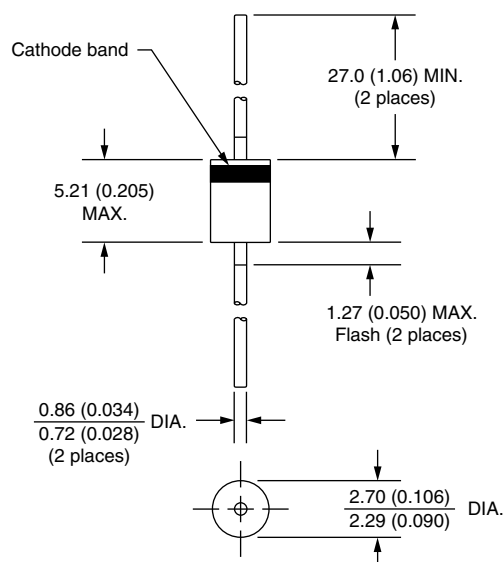
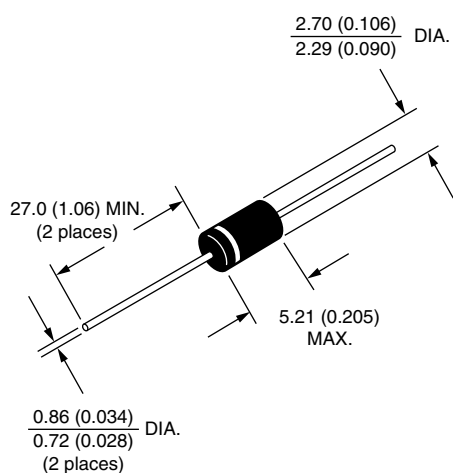
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-1N5820	500	500	Bulk
VS-1N5820TR	1200	1200	Tape and reel
VS-1N5820-M3	500	500	Bulk
VS-1N5820TR-M3	1200	1200	Tape and reel

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95242">www.vishay.com/doc?95242</a>
Part marking information	<a href="http://www.vishay.com/doc?95304">www.vishay.com/doc?95304</a>
Packaging information	<a href="http://www.vishay.com/doc?95338">www.vishay.com/doc?95338</a>



## Axial DO-204AL (DO-41)

**DIMENSIONS** in millimeters (inches)





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