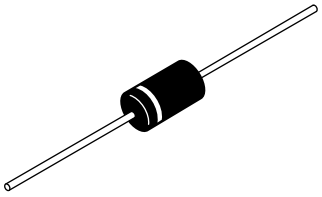
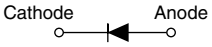
Schottky Rectifier, 3.0 A



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
- Lead (Pb)-free plating
- Designed and qualified for industrial level

RoHS COMPLIANT

PRODUCT SUMMARY	
$I_{F(AV)}$	3.0 A
V_R	20 V
I_{RM}	20 mA at 100 °C

DESCRIPTION

The 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 µs sine	450	A
V_F	3 Apk, T_J = 25 °C	0.475	V
T_J	Range	- 65 to 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	1N5820	UNITS
Maximum DC reverse voltage	V_R	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 °C, rectangular waveform With cooling fins		3.0	A
Maximum peak one cycle non-repetitive surge current at T_J = 25 °C	I_{FSM}	5 µs sine or 3 µs 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_{FM} (1)	3 A	T_J = 25 °C	0.41	0.475	V
		9.4 A		0.49	0.85	
Maximum reverse leakage current	I_{RM} (1)	T_J = 25 °C	V_R = Rated V_R	0.05	2.0	mA
		T_J = 100 °C		8.1	20	
Typical junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz), 25 °C		350	-	pF
Typical series inductance	L_S	Measured lead to lead 5 mm from package body		9.0	-	nH
Maximum voltage rate of change	dV/dt	Rated V_R		-	10 000	V/µs

Note

(1) Pulse width < 300 µs, 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	°C
Maximum thermal resistance, junction to lead	R_{thJL}	With fin 20 x 20 (0.79 x 0.79) 1.0 thick	34	°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

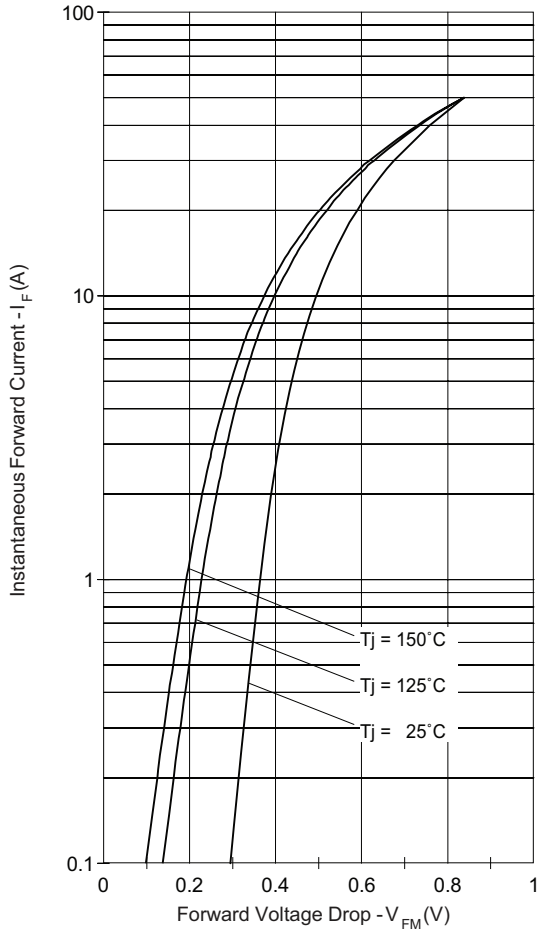


Fig. 1 - Maximum Forward Voltage Drop Characteristics

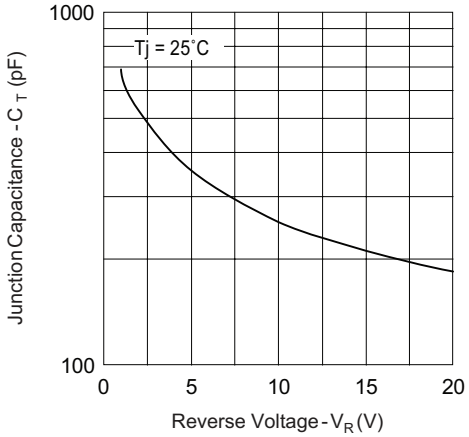


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

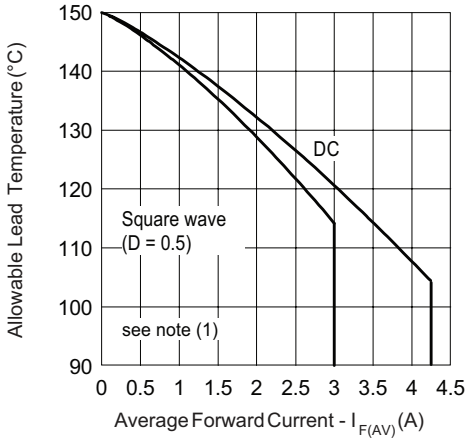


Fig. 4 - Typical Average Forward Current vs. Allowable Lead Temperature

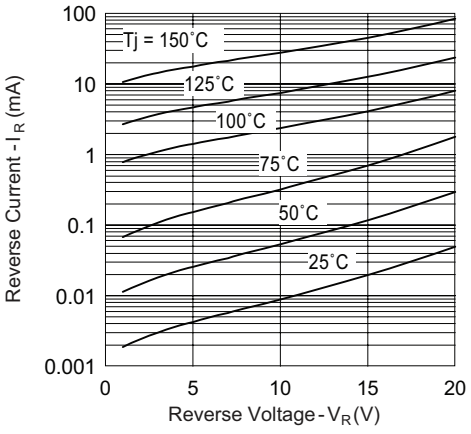


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

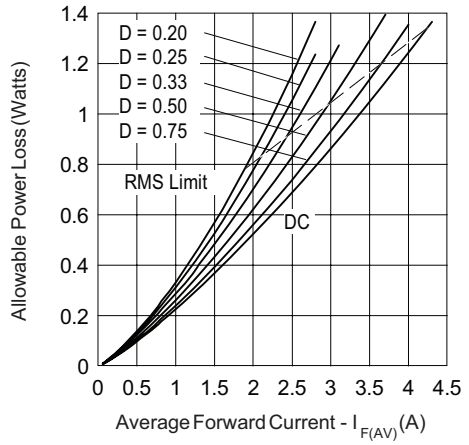


Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current

Note

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

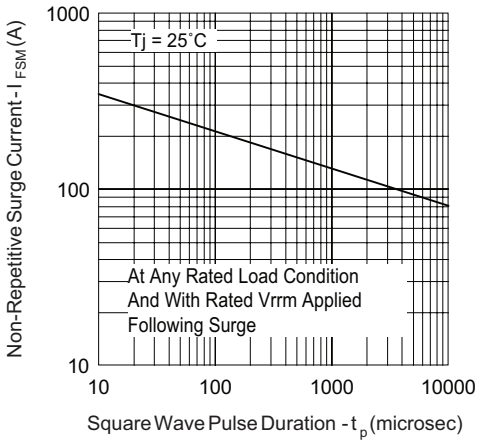
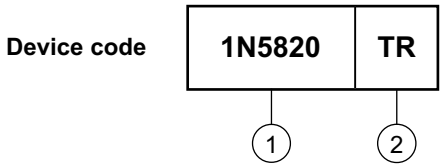


Fig. 6 - Maximum Peak Surge Forward Current vs. Pulse Duration

ORDERING INFORMATION TABLE



1 - Part number: 3 A, 20 V

2 - TR = Tape and reel package (1200 pcs)
None = Box package (500 pcs)

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95242
Part marking information	http://www.vishay.com/doc?95304
Packaging information	http://www.vishay.com/doc?95309

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