Bulletin PD-20647 rev. A 02/02

International
IOR Rectifier

1N5820

SCHOTTKY RECTIFIER 3.0 Amp

Major Ratings and Characteristics

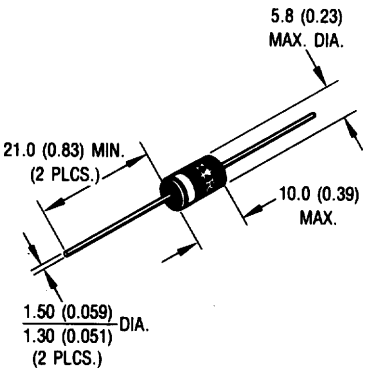
Characteristics		1N5820	Units
$I_{F(AV)}$	Rectangular waveform	3.0	A
V_{RRM}		20	V
I_{FSM}	@tp = 5 µs sine	450	A
V_F	@3Apk, T_J = 25°C	0.475	V
T_J		- 65 to 150	°C

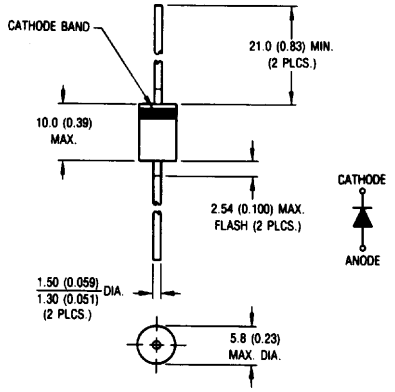
Description/ Features

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, free-wheeling diodes, and reverse battery protection.

- Low profile, axial leaded outline
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

CASE STYLE AND DIMENSIONS





Outline C - 16

Dimensions in millimeters and inches

Voltage Ratings

	Part number	1N5820
V_R	Max. DC Reverse Voltage (V)	20
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	1N5820	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current	3.0	A	50% duty cycle @ T_L = 114 °C, rectangular wave form With cooling fins	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current, @ T_J = 25°C	450	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		90		10ms Sine or 6ms Rect. pulse	

Electrical Specifications

	Parameters	Typ.	Max.	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1)	0.41	0.475	V	@ 3A	T_J = 25 °C
		0.49	0.85	V	@ 9.4A	
I_{RM}	Max. Reverse Leakage Current (1)	0.05	2.0	mA	T_J = 25 °C	V_R = rated V_R
		8.1	20	mA	T_J = 100 °C	
C_T	Typical Junction Capacitance	350	-	pF	V_R = 5V_{DC} (test signal range 100kHz to 1Mhz), @ 25°C	
L_S	Typical Series Inductance	9.0	-	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change	-	10000	V/ µs	(Rated V_R)	

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

	Parameters	1N5820	Units	Conditions
T_J	Max. Junction Temperature Range (2)	-65 to 150	°C	
T_{stg}	Max. Storage Temperature Range	-65 to 150	°C	
R_{thJL}	Max. Thermal Resistance Junction to Lead	34	°C/W	With fin 20x20 (0.79x0.79) 1.0 thick
R_{thJA}	Max. Thermal Resistance Junction to Ambient	80	°C/W	DC operation, without cooling fin
Wt	Approximate Weight	1.2(0.042)	gr(oz)	
	Case Style	C-16		

(2) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

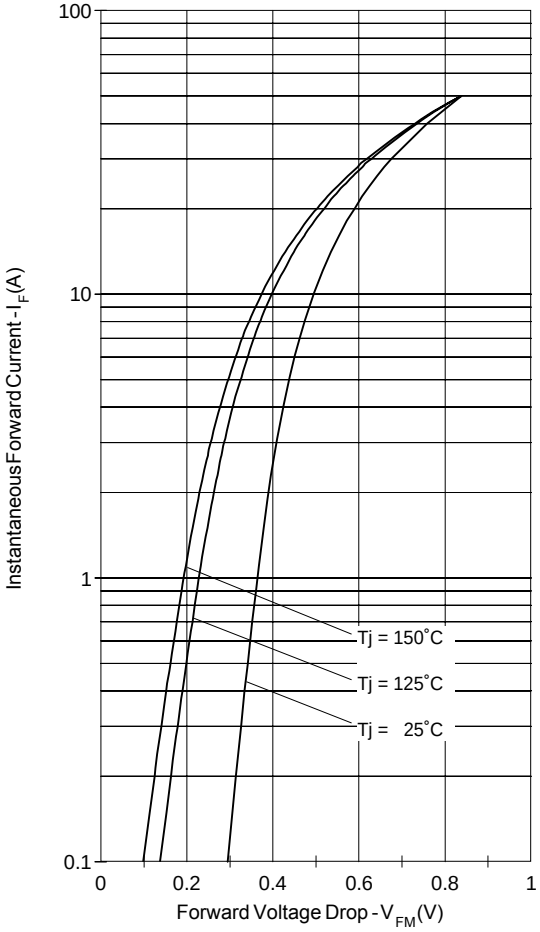


Fig. 1 - Typical Forward Voltage Drop Characteristics

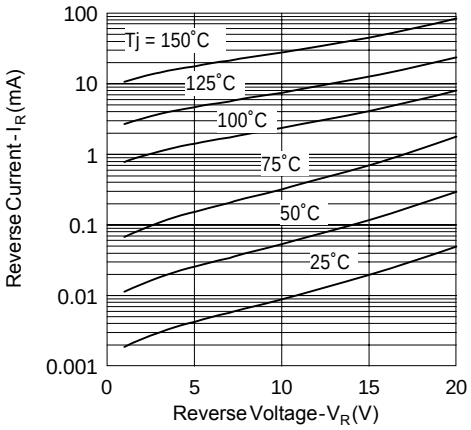


Fig. 2 - Typical Peak Reverse Current
Vs. Reverse Voltage

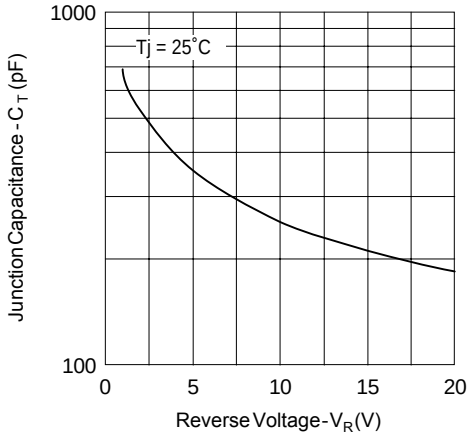


Fig. 3 - Typical Junction Capacitance
Vs. Reverse Voltage

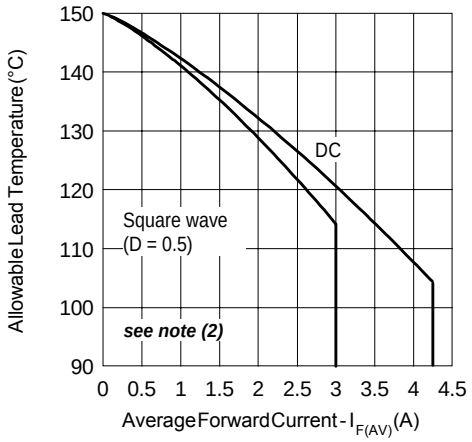


Fig. 4 - Maximum Average Forward Current
Vs. Allowable Lead Temperature

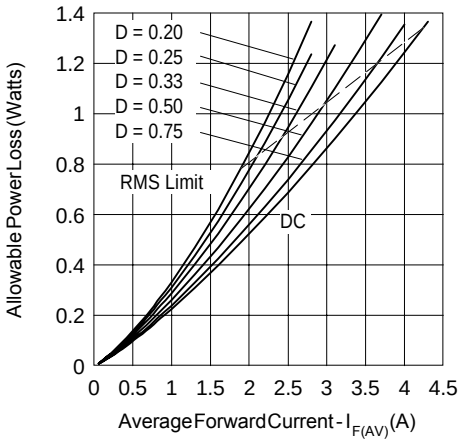


Fig. 5 - Maximum Average Forward Dissipation
Vs. Average Forward Current

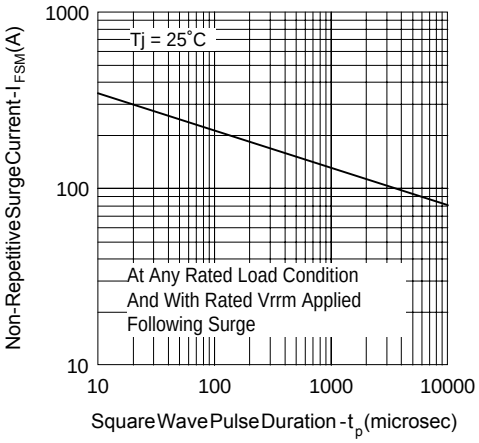


Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

Marking & Identification

Each device has marking and identification on two rows.
- The first row designates the device as manufactured by International Rectifier as indicated by the letters "IR", then Part Number.
- The second row shows the data code: Year and Week.

See below marking diagram.

FIRST ROW

IR 1N5820

SECOND ROW

Date Code

YY WW

Ordering Information

IR 1N5820 TR - TAPE AND REEL

WHEN ORDERING, INDICATE THE PART NUMBER AND THE QUANTITY (IN MULTIPLES OF 1200 PIECES).

EXAMPLE: IR 1N5820 TR - 2400 PIECES

IR 1N5820 SERIES - BULK QUANTITIES

WHEN ORDERING, INDICATE THE PART NUMBER AND THE QUANTITY (IN MULTIPLE OF 500 PIECES)

EXAMPLE: IR 1N5820 - 1000 PIECES

Data and specifications subject to change without notice.
This product has been designed for Industrial Level.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 02/02