Bulletin PD-2.306 rev. H 11/04

International
IOR Rectifier

31DQ09
31DQ10

SCHOTTKY RECTIFIER

3.3 Amp

Major Ratings and Characteristics

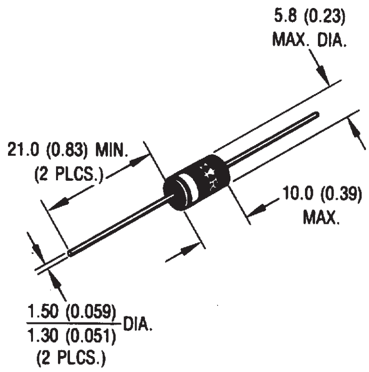
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.3	A
V_{RRM}	90/100	V
I_{FSM} @ tp = 5 µs sine	210	A
V_F @3 Apk, T_J = 25°C	0.85	V
T_J	- 40 to 150	°C

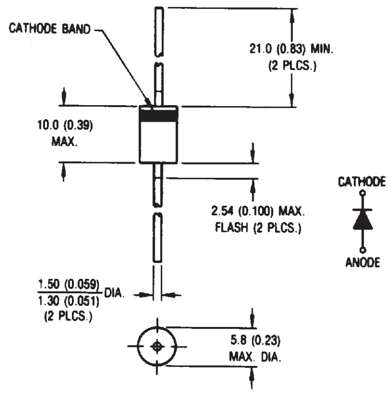
Description/ Features

The 31DQ.. 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
- Lead-Free plating

CASE STYLE AND DIMENSIONS





Outline C - 16

Dimensions in millimeters and inches

Voltage Ratings

	Part number	31DQ09	31DQ10
V_R	Max. DC Reverse Voltage (V)	90	100
V_{RWM}	Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

	Parameters	31DQ..	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 4	3.3	A	50% duty cycle @ T_C = 53.4°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	210	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 6	34		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	3.0	mJ	T_J = 25 °C, I_{AS} = 1.0 Amps, L = 6 mH	
I_{AR}	Repetitive Avalanche Current	0.5	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	31DQ..	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.85	V	@ 3A	T_J = 25 °C
	* See Fig. 1 (1)	0.97	V	@ 6A	
		0.69	V	@ 3A	T_J = 125 °C
		0.80	V	@ 6A	
I_{RM}	Max. Reverse Leakage Current	1	mA	T_J = 25 °C	V_R = rated V_R
	* See Fig. 2 (1)	3	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance	110	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	31DQ..	Units	Conditions
T_J	Max. Junction Temperature Range	-40 to 150	°C	
T_{stg}	Max. Storage Temperature Range	-40 to 150	°C	
R_{thJA}	Max. Thermal Resistance Junction to Ambient	80	°C/W	DC operation Without cooling fins
R_{thJL}	Typical Thermal Resistance Junction to Lead	34	°C/W	DC operation
wt	Approximate Weight	1.2 (0.042)	g (oz.)	
	Case Style	C - 16		

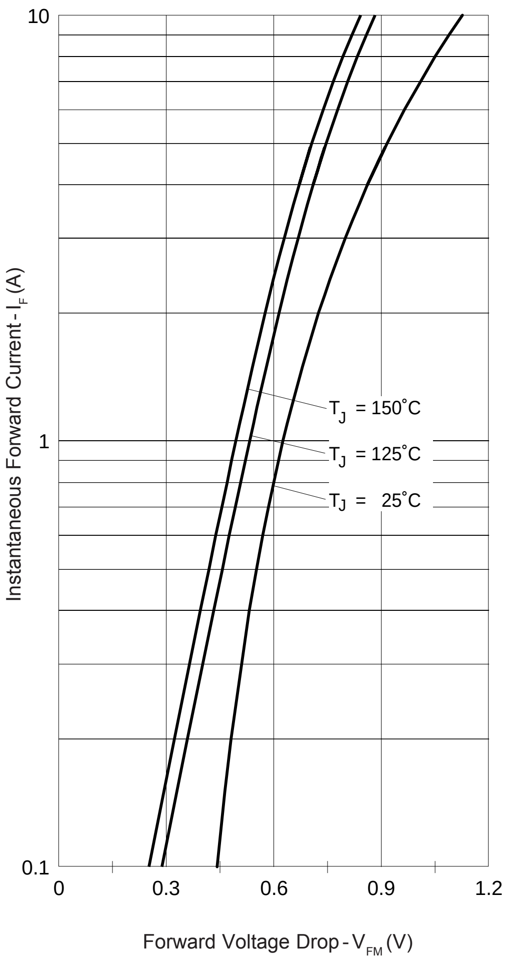


Fig. 1 - Max. Forward Voltage Drop Characteristics

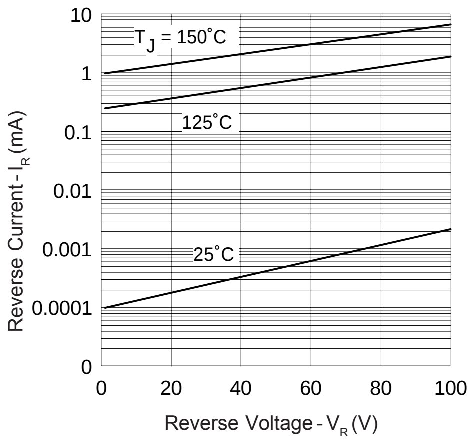


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

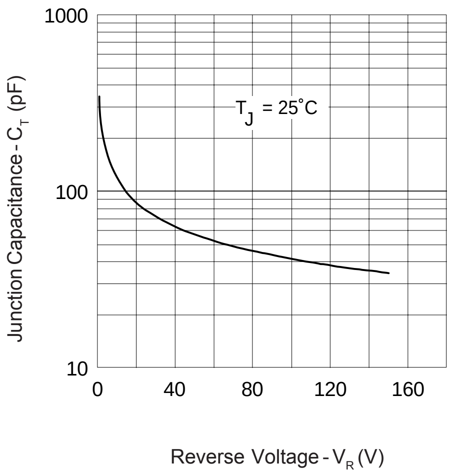


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

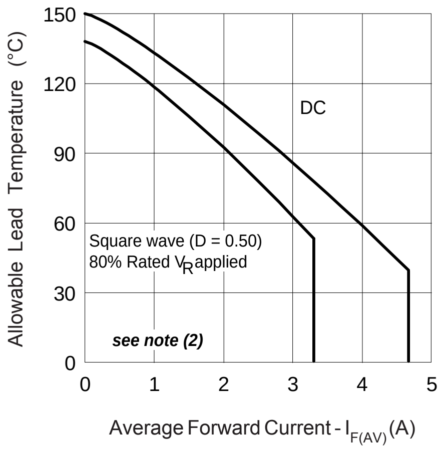


Fig. 4 - Max. Allowable Lead Temperature Vs. Average Forward Current

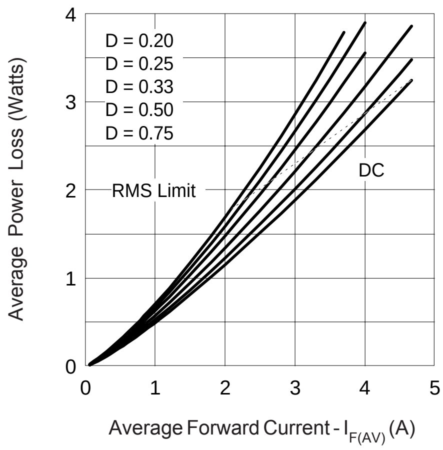


Fig. 5 - Forward Power Loss Characteristics

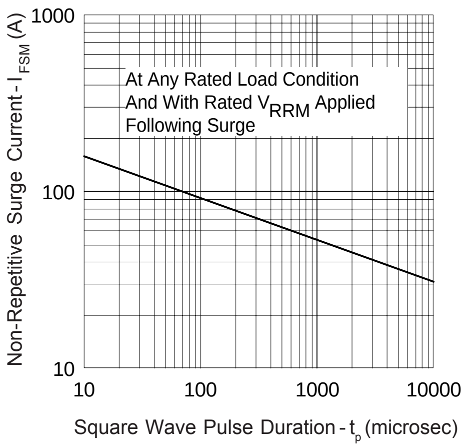


Fig. 6 - Max. Non-Repetitive Surge Current

(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 = $V_{R1} \times I_R (1 - D)$; I_R @ V_{R1} = 80% rated V_R

Ordering Information Table

Device Code

31	D	Q	10	TR
1	2	3	4	5

1	-	31 =	3.3A (Axial and small packages - Current is x10)	
2	-	D =	DO-201 package	
3	-	Q =	Schottky Q.. Series	
4	-	10 =	Voltage Ratings	10 = 100V 09 = 90V
5	-	TR =	Tape & Reel package (1200 pcs)	
		- =	Box package (500 pcs)	

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31DQ10
*********************************************
* SPICE Model Diode                         *
*********************************************
.SUBCKT 31DQ10 ANO CAT
D1 ANO 1 CAT
*Define diode model
.MODEL DMOD D(Is=56.46E-06 N=2.202 Rs=28.27E-03 Ikf=0.5957 Xti=2 Eg=1.11
+               Cjo=199.3E-12 M=0.4572 Vj=1.873 Fc=0.5 Isr=165.6E-24 Nr=4.955
+               Bv=119.9 Ibv=215.5E-06 Tt=21.64E-09)
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.ENDS 31DQ10
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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
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. 11/04