

International **IR** Rectifier

SCHOTTKY RECTIFIER

31DQ09G

31DQ10G

3.3 Amp

$I_{F(AV)} = 3.3$ Amp
 $V_R = 90 - 100$ V

Major Ratings and Characteristics

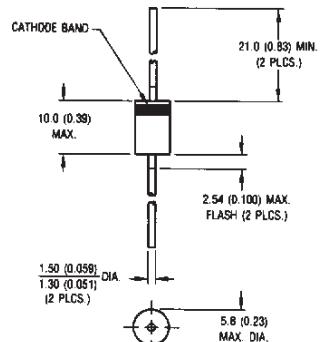
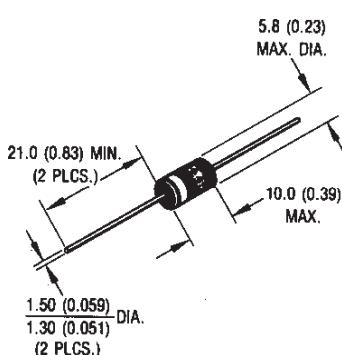
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.3	A
V_{RRM}	90 - 100	V
$I_{F(SM)}$ @ $t_p = 5$ μ s sine	370	A
V_F @ 3Apk, $T_J = 25^\circ\text{C}$	0.85	V
T_J	-40 to 150	$^\circ\text{C}$

Description/ Features

The 31DQ..G 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	31DQ09G	31DQ10G
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 @ $T_C = 53.4^\circ\text{C}$, rectangular wave form		
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 6, $T_J = 25^\circ\text{C}$	370	A	5μs Sine or 3μs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied	
	60		10ms Sine or 6ms Rect. pulse		
E_{AS} Non-Repetitive Avalanche Energy	3.0	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1.0$ Amps, 18μs square pulse		
I_{AR} Repetitive Avalanche Current	0.5	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical		

Electrical Specifications

Parameters	31DQ..	Units	Conditions		
V_{FM} Max. Forward Voltage Drop * See Fig. 1 (1)	0.85	V	@ 3A	$T_J = 25^\circ\text{C}$	
	0.97	V	@ 6A		
	0.69	V	@ 3A	$T_J = 125^\circ\text{C}$	
	0.80	V	@ 6A		
I_{RM} Max. Reverse Leakage Current * See Fig. 2 (1)	0.1	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_R$	
	3	mA	$T_J = 125^\circ\text{C}$		
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			
Marking Device	31DQ10G			

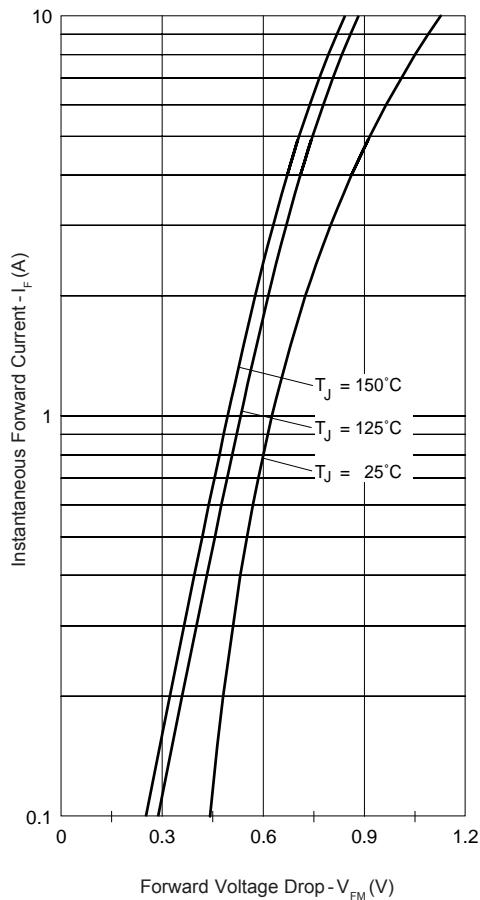


Fig. 1 - Max. Forward Voltage Drop Characteristics

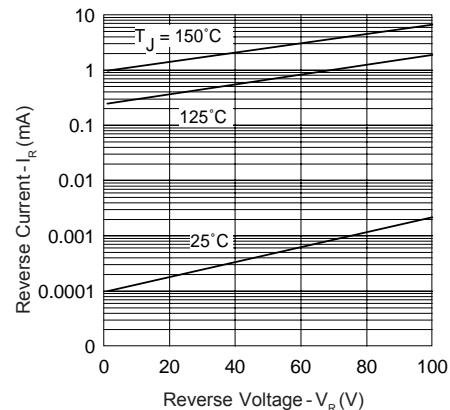


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

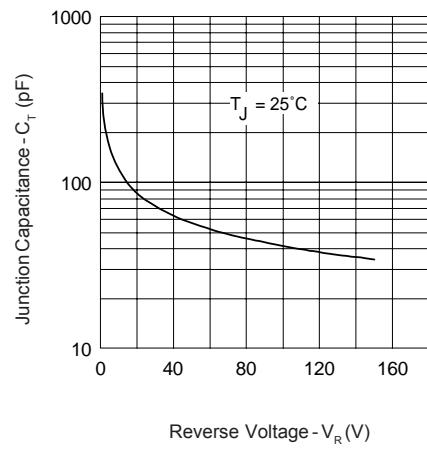


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

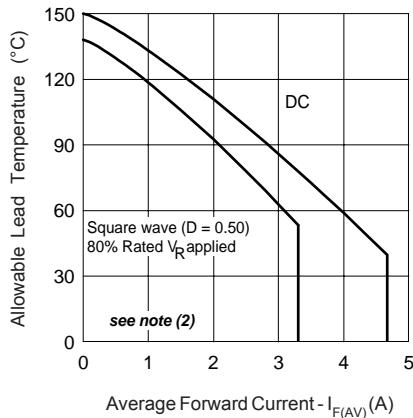


Fig. 4 - Max. Allowable Lead Temperature
 Vs. Average Forward Current

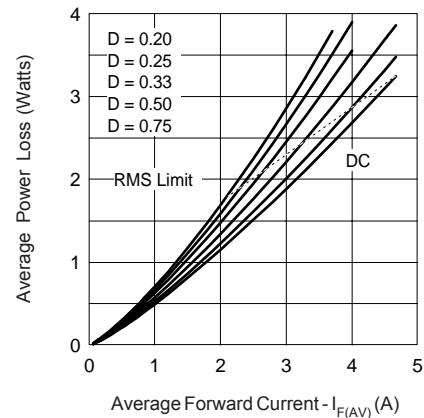


Fig. 5 - Forward Power Loss
 Characteristics

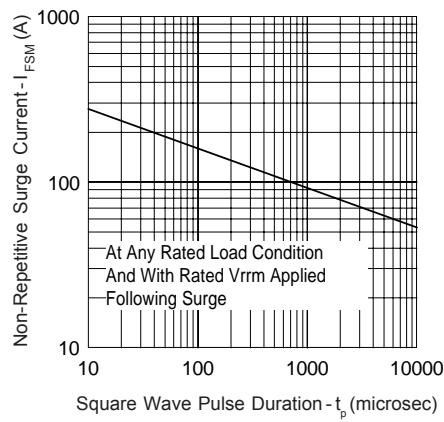


Fig. 6 - Max. Non-Repetitive Surge Current

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R @ (1 - D)$; $I_R @ V_{R1} = 80\% \text{ rated } V_R$

Ordering Information Table

Device Code	31	D	Q	10	G	TR	-
1	31						
2		D					
3			Q				
4				10			
5					G		
6						TR	
7							-
	1	2	3	4	5	6	7
1	- 31 = 3.3A (Axial and small packages - Current is x10)						
2	- D = DO-41 package						
3	- Q = Schottky Q.. Series						
4	- 10 = Voltage Ratings						
5	- G = Schottky Generation						
6	- • None = Box (500 pieces)						
	• TR = Tape & Reel (1200 pieces)						
7	- • none = Standard Production						
	• PbF = Lead-Free						

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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)
*****
.ENDS 31DQ10

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

International
IR Rectifier

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 11/05



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