Bulletin PD-2.306 rev. D 03/02

International
IOR Rectifier

31DQ09
31DQ10

SCHOTTKY RECTIFIER

3.3 Amp

Major Ratings and Characteristics

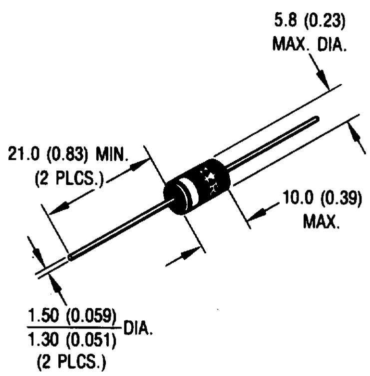
Characteristics	31DQ..	Units
$I_{F(AV)}$ Rectangular waveform	3.3	A
V_{RRM}	90/100	V
I_{FSM} @ tp = 5 μs sine	210	A
V_F @ 3 Apk, T_J = 25°C	0.85	V
T_J	-40 to 150	°C

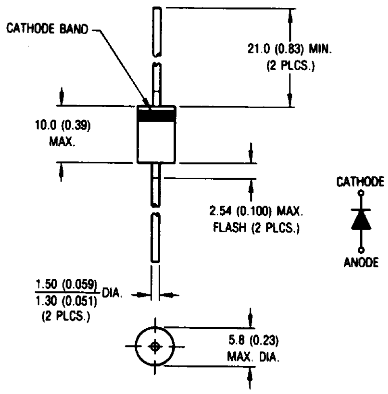
Description/Features

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

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	5.0	mJ	T_J = 25 °C, I_{AS} = 0.6 Amps, L = 10 mH	
I_{AR}	Repetitive Avalanche Current	0.2	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		

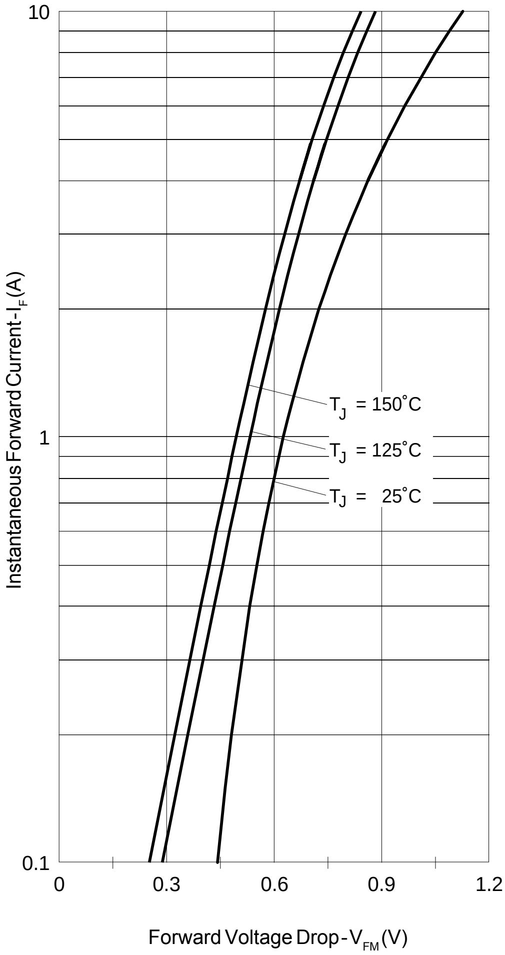


Fig. 1 - Max. Forward Voltage Drop Characteristics

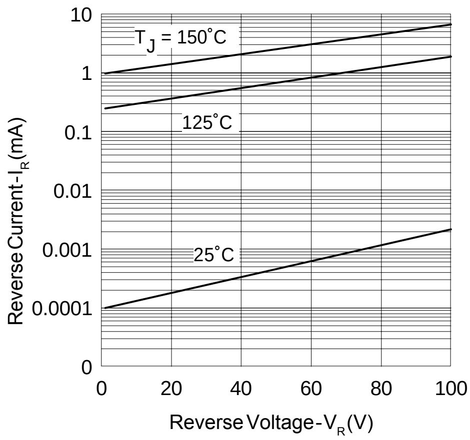


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

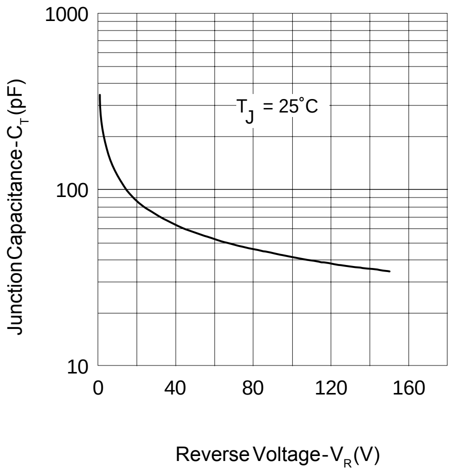


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

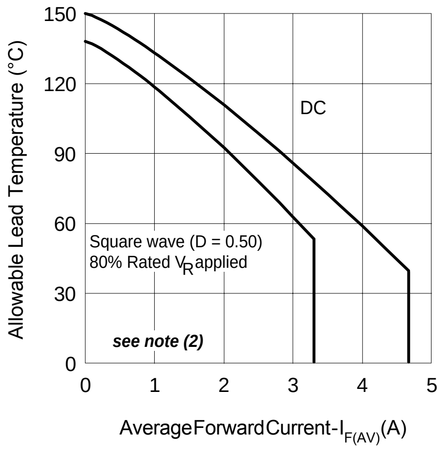


Fig. 4 - Max. Allowable Lead Temperature Vs. Average Forward Current

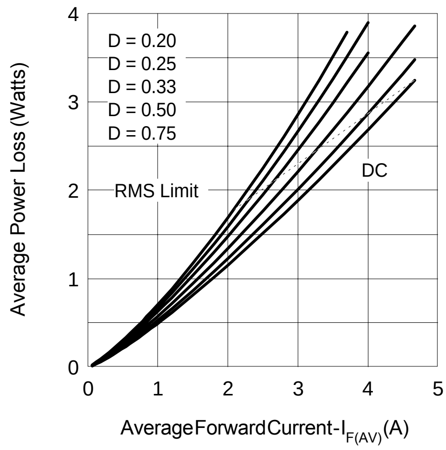


Fig. 5 - Forward Power Loss Characteristics

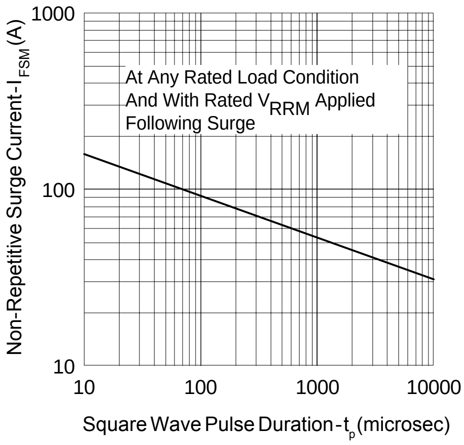


Fig. 6 - Max. Non-Repetitive Surge Current

(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-41 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)

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.

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