PD-2.305 rev. B 02/2000

International
IOR Rectifier

31DQ05
31DQ06

SCHOTTKY RECTIFIER

3.3 Amp

Major Ratings and Characteristics

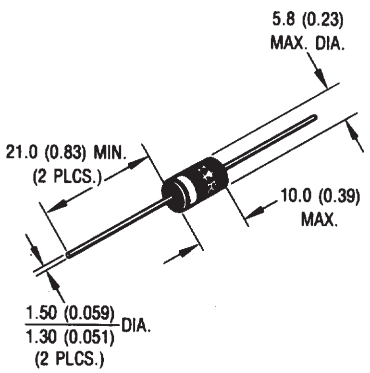
Characteristics	31DQ..	Units
$I_{F(AV)}$ Rectangular waveform	3.3	A
V_{RRM}	50/60	V
I_{FSM} @ tp = 5 μs sine	340	A
V_F @ 3 Apk, T_J = 25°C	0.62	V
T_J	- 40 to 150	°C

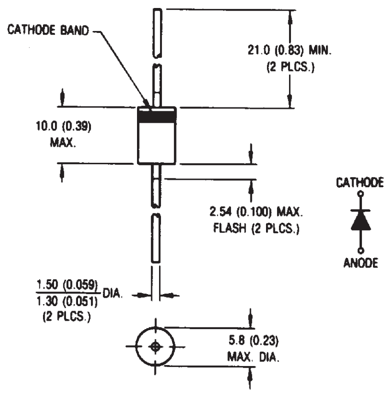
Description/Features

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	31DQ05	31DQ06
V_R	Max. DC Reverse Voltage (V)	50	60
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_A = 40 °C, rectangular wave form With cooling fins	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 6	340	A	5μs Sine or 3μs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		55		10ms Sine or 6ms Rect. pulse	

Electrical Specifications

	Parameters	31DQ..	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop * See Fig. 1 (1)	0.62	V	@ 3A	T_J = 25 °C
		0.78	V	@ 6A	
		0.54	V	@ 3A	T_J = 125 °C
		0.65	V	@ 6A	
I_{RM}	Max. Reverse Leakage Current * See Fig. 2 (1)	2	mA	T_J = 25 °C	V_R = rated V_R
		15	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance	160	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	

(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_{thJA}	Typical Thermal Resistance Junction to Ambient	34	°C/W	With fin 20 x 20 (0.79 x 0.79) 1.0 (0.04) thick. Dimensions in millimeters (inches)
wt	Approximate Weight	1.2 (0.042)	g (oz.)	
	Case Style	C-16		

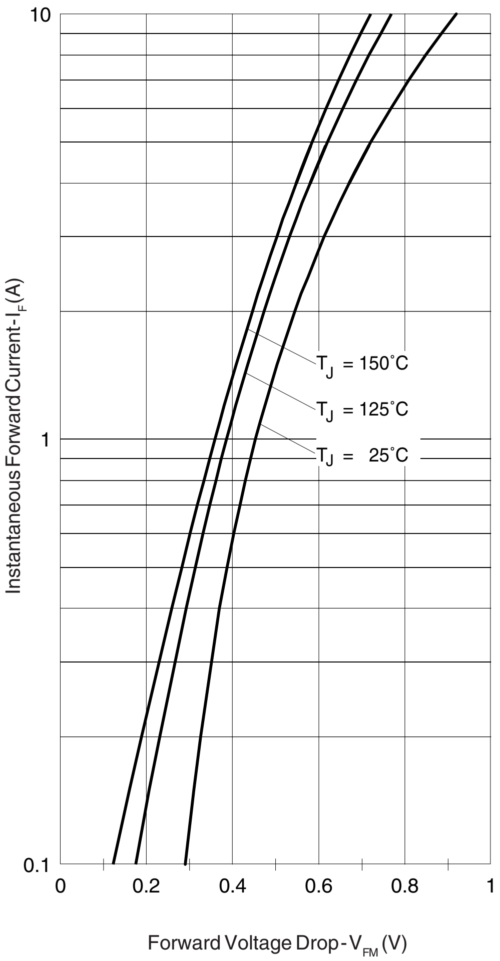


Fig. 1 - Max. Forward Voltage Drop Characteristics

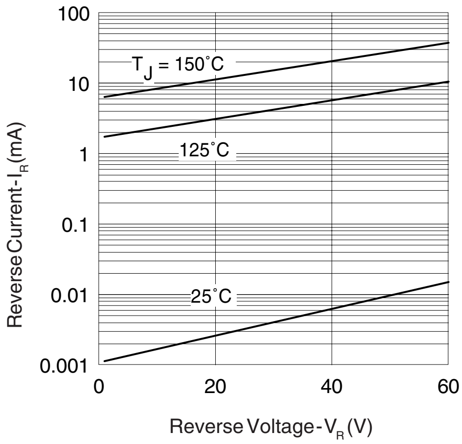


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

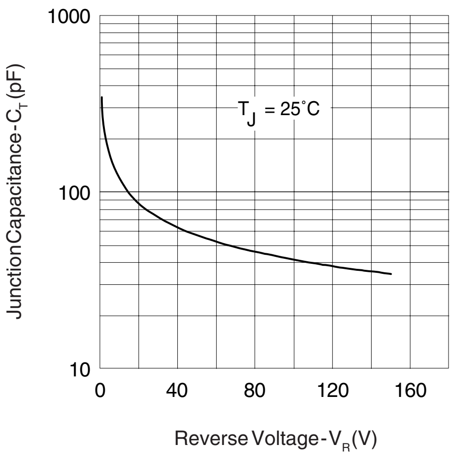


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

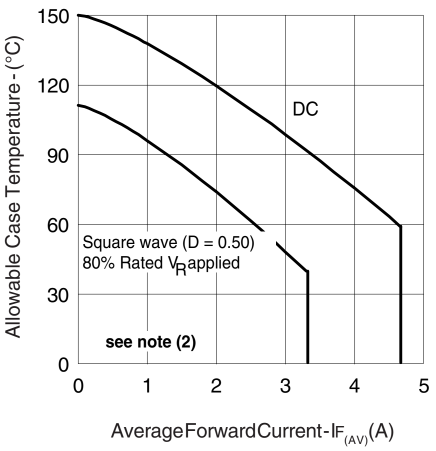


Fig. 4 - Max. Allowable Case Temperature Vs. Average Forward Current

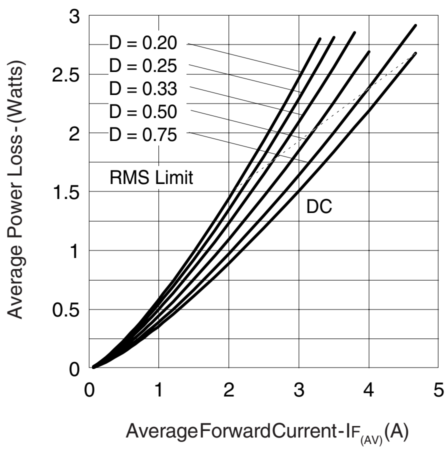


Fig. 5 - Forward Power Loss Characteristics

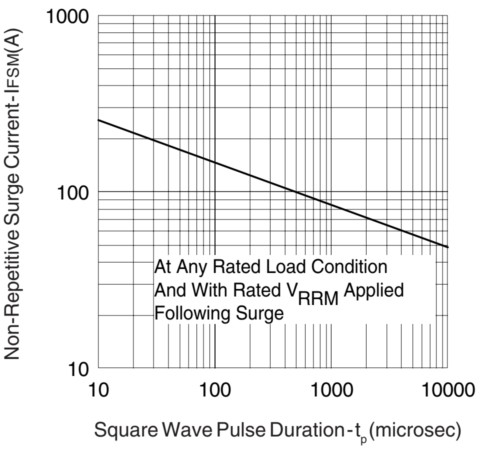


Fig. 6 - Max. Non-Repetitive Surge Current

(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

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