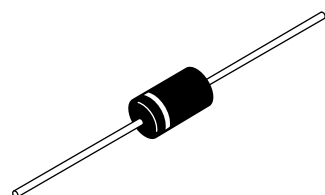


### Schottky Rectifier, 3.3 A



C-16



#### FEATURES

- Low profile, axial leaded outline
- High frequency operation
- Very low forward voltage drop
- High purity, high temperature epoxy encapsulation forenhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long termreliability
- Lead (Pb)-free plating
- Designed and qualified for industrial level



**RoHS**  
COMPLIANT

#### PRODUCT SUMMARY

$I_{F(AV)}$	3.3 A
$V_R$	90/100 V

#### DESCRIPTION

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, freewheeling diodes, and reverse battery protection.

#### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	3.3	A
$V_{RRM}$		90/100	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	370	A
$V_F$	3 Apk, $T_J = 25^\circ C$	0.85	V
$T_J$		- 40 to 150	$^\circ C$

#### VOLTAGE RATINGS

PARAMETER	SYMBOL	31DQ09G	31DQ10G	UNITS
Maximum DC reverse voltage	$V_R$	90	100	V
Maximum working peak reverse voltage	$V_{RWM}$			

#### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current See fig. 4	I <sub>F(AV)</sub>	50 % duty cycle at T <sub>C</sub> = 53.4 °C, rectangular waveform		3.3	A
Maximum peak one cycle non-repetitive surge current, T <sub>J</sub> = 25 °C See fig. 6	I <sub>FSM</sub>	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V <sub>RRM</sub> applied	370	
		10 ms sine or 6 ms rect. pulse		60	
Non-repetitive avalanche energy	E <sub>AS</sub>	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 1 A, 18 μs square pulse		3.0	mJ
Repetitive avalanche current	I <sub>AR</sub>	Current decaying linearly to zero in 1 μs Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical		0.5	A

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	3 A	$T_J = 25\text{ }^{\circ}\text{C}$	0.85	V	
		6 A		0.97		
		3 A	$T_J = 125\text{ }^{\circ}\text{C}$	0.69		0.80
		6 A				
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	0.1	mA	
		$T_J = 125\text{ }^{\circ}\text{C}$		3		
Typical junction capacitance	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$		110	pF	
Typical series inductance	$L_S$	Measured lead to lead 5 mm from package body		9.0	nH	
Maximum voltage rate of charge	dV/dt	Rated $V_R$		10 000	V/μs	

**Note**(1) Pulse width < 300  $\mu$ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$		- 40 to 150	°C
Maximum thermal resistance, junction to ambient	$R_{thJA}$	DC operation Without cooling fin	80	°C/W
Typical thermal resistance, junction to lead	$R_{thJL}$	DC operation	34	
Approximate weight			1.2	g
			0.042	oz.
Marking device		Case style C-16	31DQ09G	
			31DQ10G	

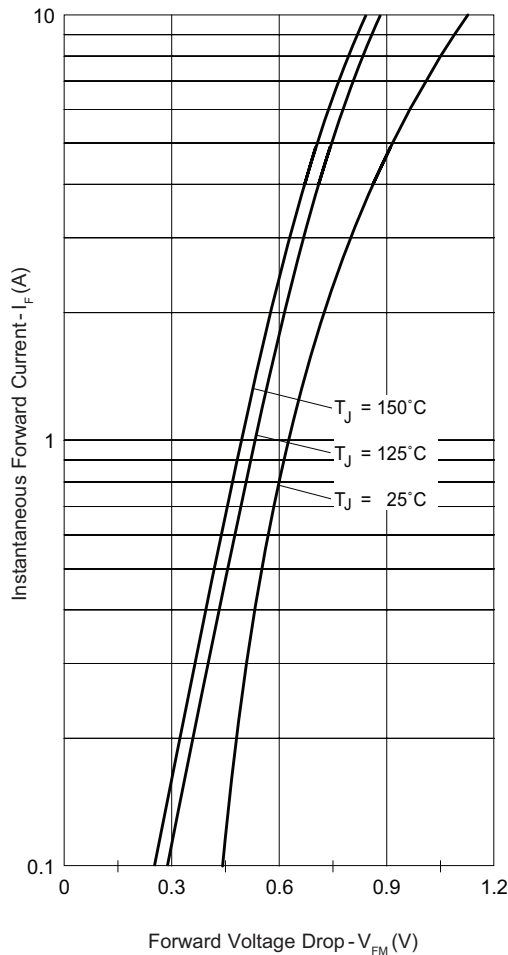


Fig. 1 - Maximum Forward Voltage Drop Characteristics

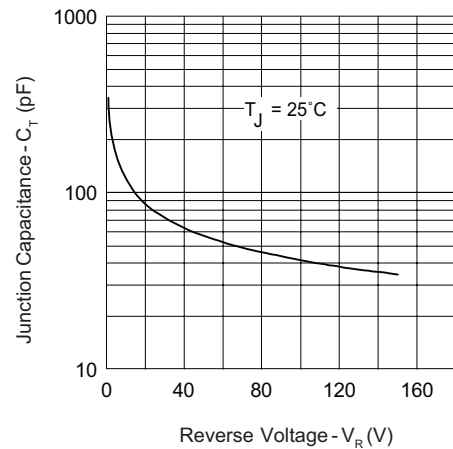


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

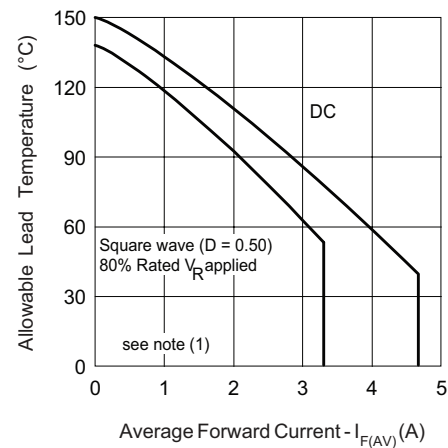


Fig. 4 - Maximum Allowable Lead Temperature vs. Average Forward Current

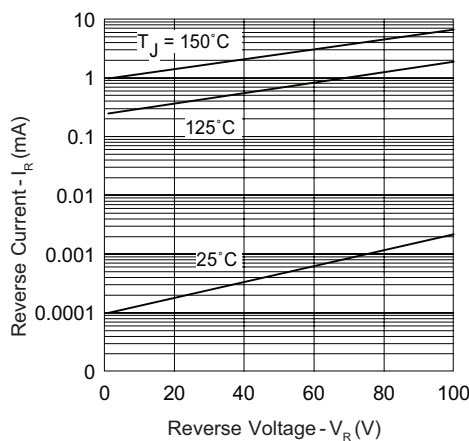


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

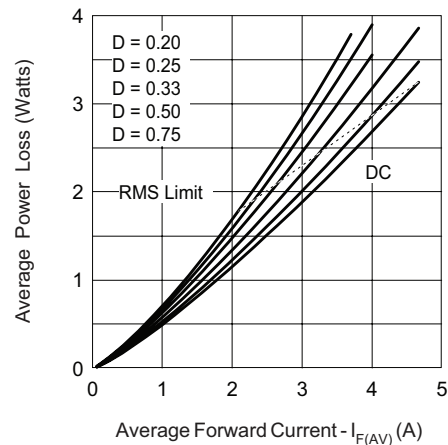


Fig. 5 - Forward Power Loss Characteristics

### Note

(6) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$

$P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  $P_{dREV}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 80\%$  rated  $V_R$

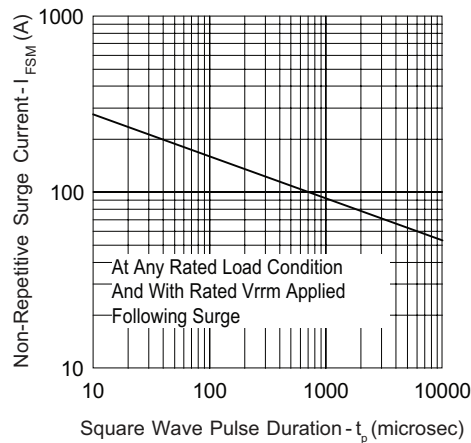


Fig. 6 - Maximum Non-Repetitive Surge Current

ORDERING INFORMATION TABLE

Device code	31	D	Q	10	G	TR	-
	1	2	3	4	5	6	7
1	-	31 = 3.3 A (axial and small packages - current is x 10)					
2	-	D = DO-41 package					
3	-	Q = Schottky Q.. series					
4	-	10 = Voltage ratings					09 = 90 V 10 = 100 V
5	-	G = Schottky generation					
6	-	• None = Box package (500 pcs) • TR = Tape and reel package (1200 pcs)					
7	-	• None = Standard production • PbF = Lead (Pb)-free					

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95242">http://www.vishay.com/doc?95242</a>
Part marking information	<a href="http://www.vishay.com/doc?95304">http://www.vishay.com/doc?95304</a>
Packaging information	<a href="http://www.vishay.com/doc?95309">http://www.vishay.com/doc?95309</a>
SPICE model	<a href="http://www.vishay.com/doc?95300">http://www.vishay.com/doc?95300</a>



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