

International
IOR Rectifier

50UQ03GPbF

SCHOTTKY RECTIFIER

5.5 Amp

$$I_{F(AV)} = 5.5\text{Amp}$$

$$V_R = 30\text{V}$$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	5.5	A
V_{RRM}	30	V
I_{FSM} @tp = 5 μ s sine	240	A
V_F @5 Apk, $T_J = 125^\circ\text{C}$	0.35	V
T_J range	-40 to 150	$^\circ\text{C}$

Description/ Features

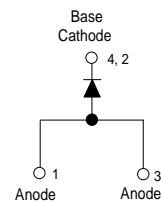
The 50UQ03GPbF I-PAK Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- 150 $^\circ\text{C}$ T_J operation
- Unique I-PAK outline
- Center tap configuration
- Small foot print
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles



I-PAK (TO-251)



Voltage Ratings

Part number	50UQ03GPbF
V_R Max. DC Reverse Voltage (V)	30
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	50UQ...	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	5.5	A	50% duty cycle @ $T_C = 136^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	240	A	5 μs Sine or 3 μs Rect. pulse
	100		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	10	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 2.0$ Amps, $L = 5$ mH
I_{AR} Repetitive Avalanche Current	2.0	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	50UQ...	Units	Conditions
V_{FM} Max. Forward Voltage Drop * See Fig. 1 (1)	0.46	V	@ 5A $T_J = 25^\circ\text{C}$
	0.53	V	@ 10A
	0.39	V	@ 5A $T_J = 125^\circ\text{C}$
	0.48	V	@ 10A
I_{RM} Max. Reverse Leakage Current * See Fig. 2 (1)	1.1	mA	$T_J = 25^\circ\text{C}$
	58	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.19	V	$T_J = T_J$ max.
r_t Forward Slope Resistance	22.22	m Ω	
C_T Typical Junction Capacitance	590	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance	5.0	nH	Measured lead to lead 5mm from package body

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	50UQ...	Units	Conditions
T_J Max. Junction Temperature Range (*)	-40 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-40 to 150	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case	3.0	$^\circ\text{C/W}$	DC operation * See Fig. 4
wt Approximate Weight	0.3 (0.01)	g (oz.)	
Case Style	I-Pak		Similar to TO-251SL
Device Marking	50UQ03G		

(*) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

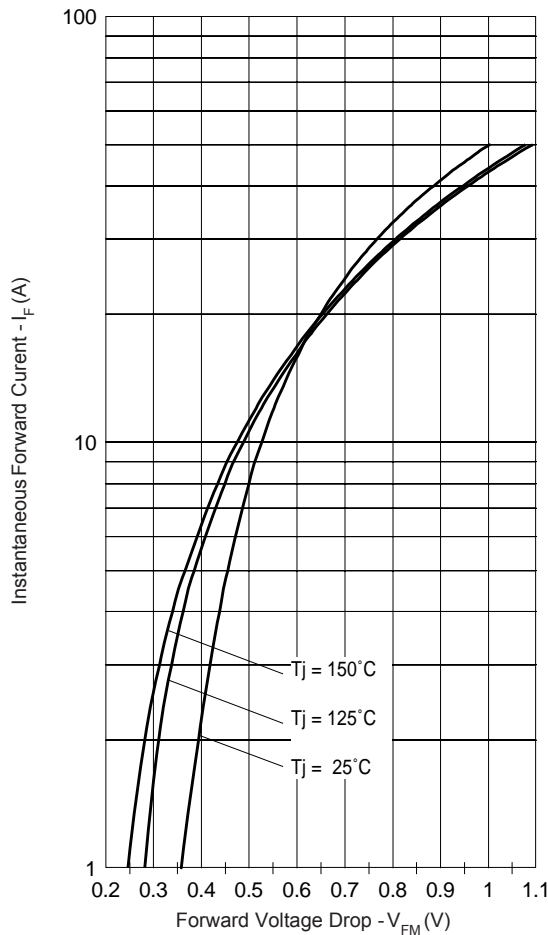


Fig. 1 - Maximum Forward Voltage Drop Characteristics

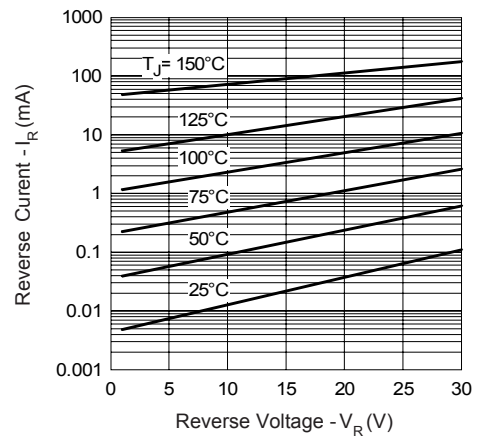


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

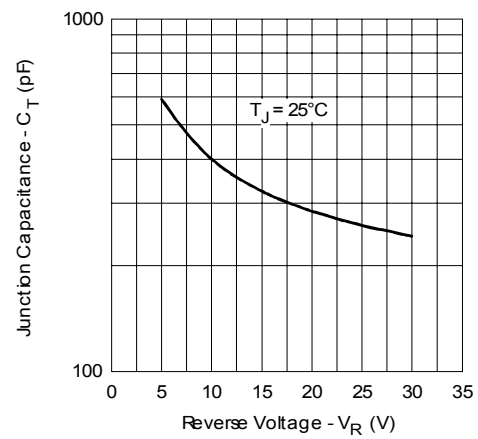


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

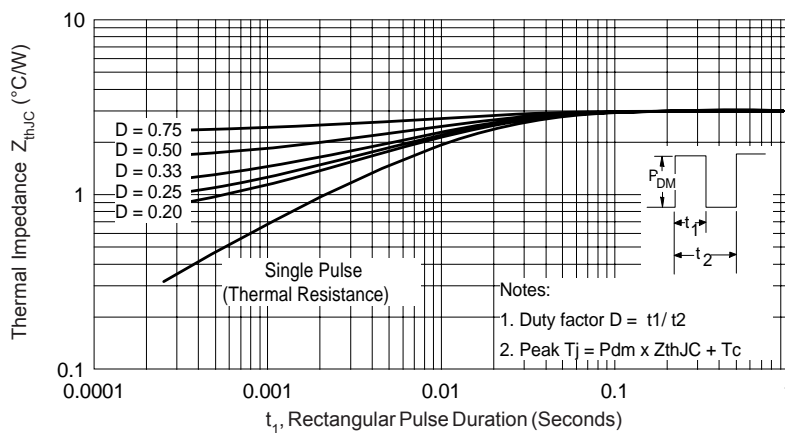


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

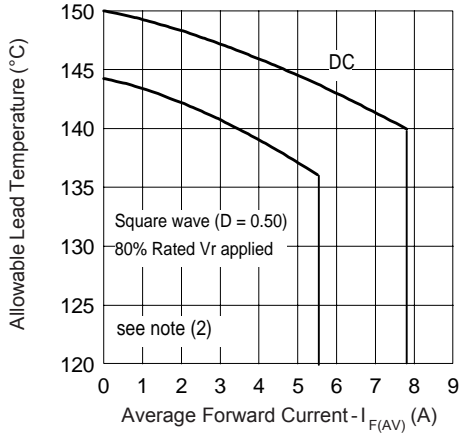


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

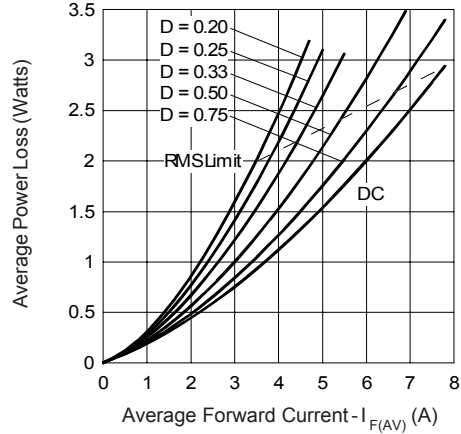


Fig. 6 - Forward Power Loss Characteristics

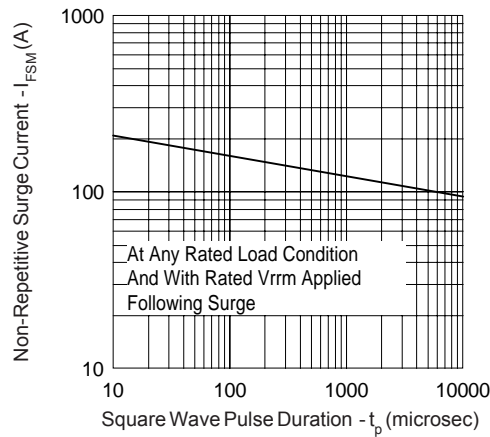


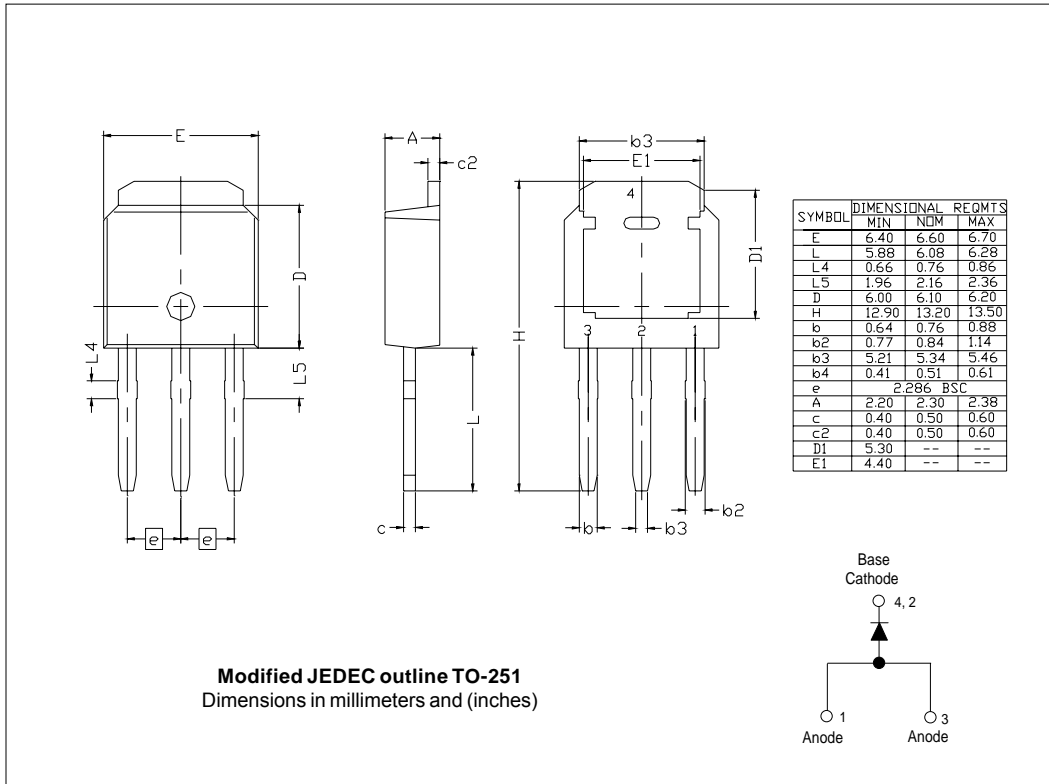
Fig. 7 - Maximum Non-Repetitive Surge Current

(2) Formula used: $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$;

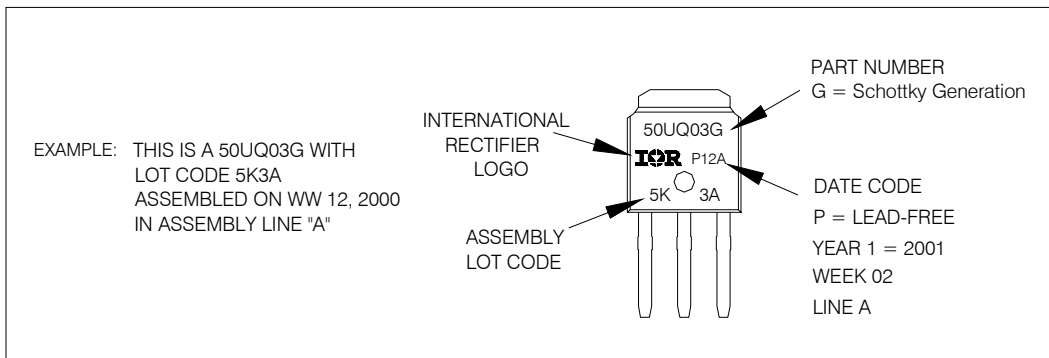
$Pd = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$Pd_{REV} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\% \text{ rated } V_R$

Outline Table



Marking Information



Ordering Information Table

Device Code													
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">50</td> <td style="padding: 5px;">U</td> <td style="padding: 5px;">Q</td> <td style="padding: 5px;">03</td> <td style="padding: 5px;">G</td> <td style="padding: 5px;">PbF</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> </tr> </table>	50	U	Q	03	G	PbF	①	②	③	④	⑤	⑥
50	U	Q	03	G	PbF								
①	②	③	④	⑤	⑥								
1	- Current Rating												
2	- Package U= I-PAK												
3	- Q =Schottky Q Series												
4	- Voltage Rating: Code x 10 = V_{RRM} (03 = 30V)												
5	- Schottky Generation												
6	- <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free 												

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
IR Rectifier

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05/06



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