Bulletin PD-21139 05/06

International
IOR Rectifier

50UQ03GPbF

SCHOTTKY RECTIFIER

5.5 Amp

$I_{F(AV)}$ = 5.5Amp
V_R = 30V

Major Ratings and Characteristics

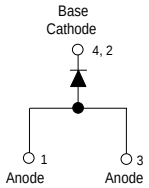
Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	5.5	A
V_{RRM}		30	V
I_{FSM}	@ tp = 5 µs sine	240	A
V_F	@ 5 Apk, T_J = 125°C	0.35	V
T_J	range	-40 to 150	°C

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°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°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	240	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	100		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	10	mJ	T_J = 25 °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 x V_R typical	

Electrical Specifications

	Parameters	50UQ...	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.46	V	@ 5A	T_J = 25 °C
	* See Fig. 1 (1)	0.53	V	@ 10A	
		0.39	V	@ 5A	T_J = 125 °C
		0.48	V	@ 10A	
I_{RM}	Max. Reverse Leakage Current	1.1	mA	T_J = 25 °C	V_R = rated V_R
	* See Fig. 2 (1)	58	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.19	V	T_J = T_J max.	
r_t	Forward Slope Resistance	22.22	mΩ		
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 < 300µs, Duty Cycle < 2%

Thermal-Mechanical Specifications

	Parameters	50UQ...	Units	Conditions
T_J	Max. Junction Temperature Range (*)	-40 to 150	°C	
T_{stg}	Max. Storage Temperature Range	-40 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case	3.0	°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		

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

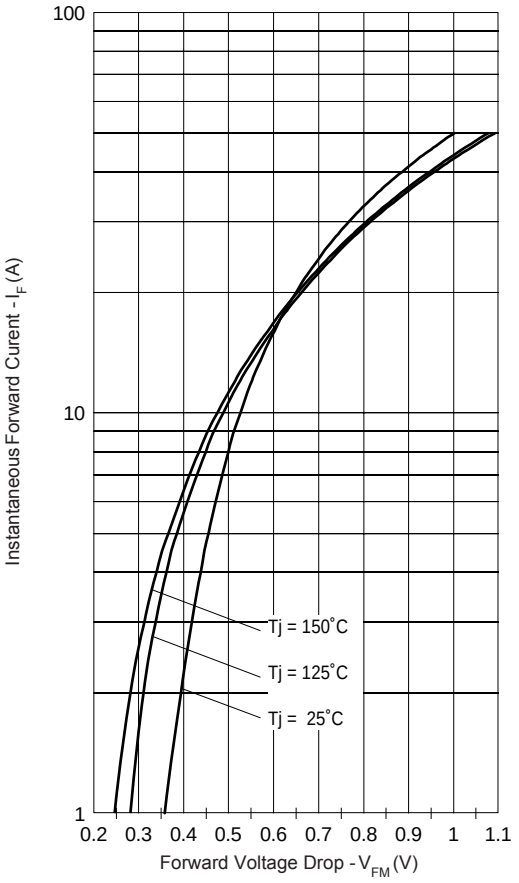


Fig. 1 - Maximum Forward Voltage Drop Characteristics

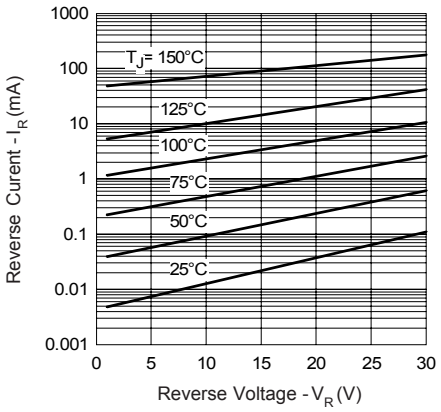


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

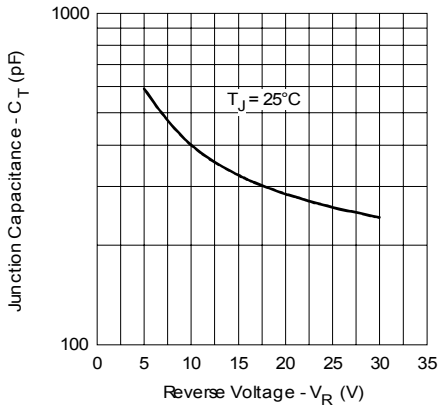


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

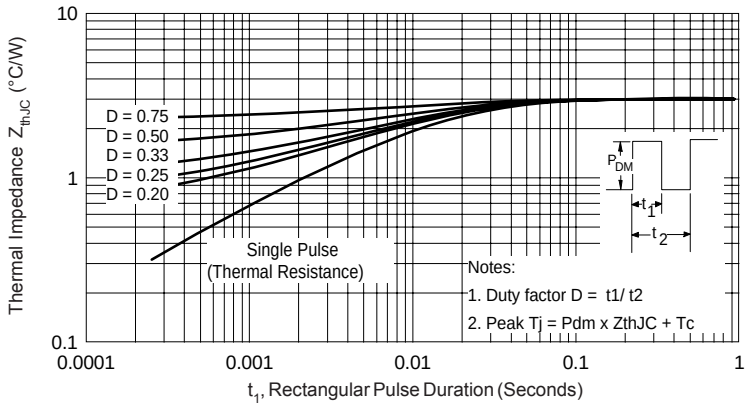


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

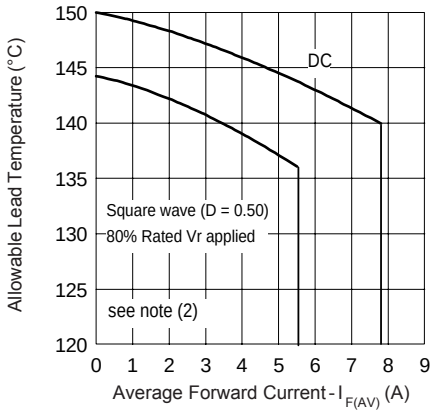


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

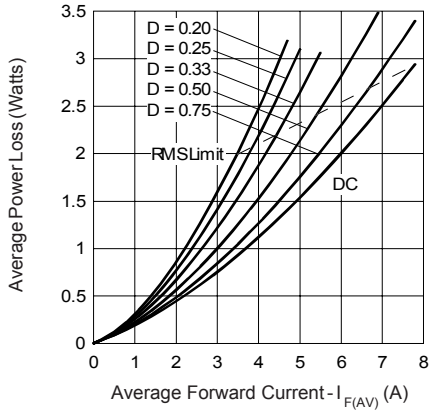


Fig. 6 - Forward Power Loss Characteristics

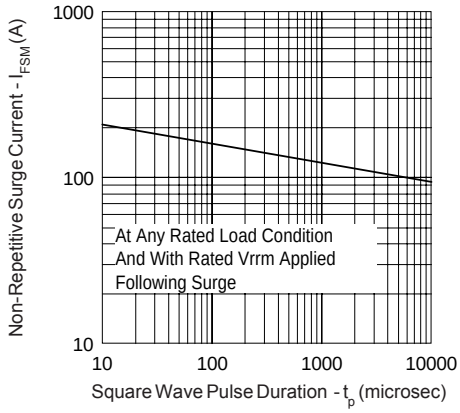
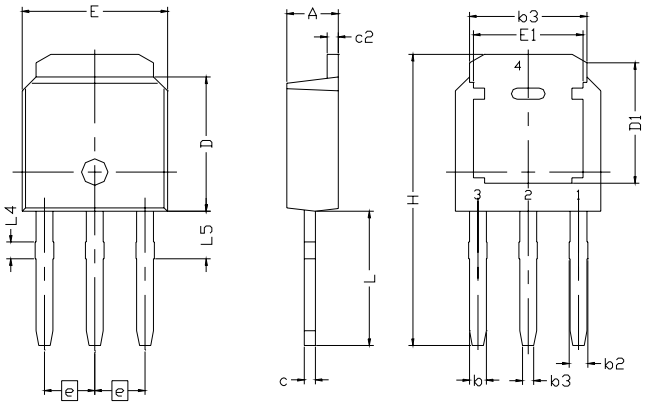


Fig. 7 - Maximum Non-Repetitive Surge Current

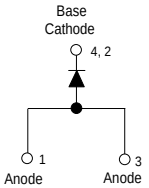
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table



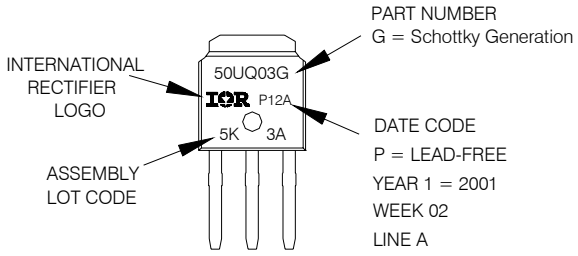
SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.70
L	5.88	6.08	6.28
L4	0.66	0.76	0.86
L5	1.96	2.16	2.36
D	6.00	6.10	6.20
H	12.90	13.20	13.50
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
b4	0.41	0.51	0.61
e	2.286 BSC		
A	2.20	2.30	2.38
c	0.40	0.50	0.60
c2	0.40	0.50	0.60
D1	5.30	--	--
E1	4.40	--	--

Modified JEDEC outline TO-251
Dimensions in millimeters and (inches)



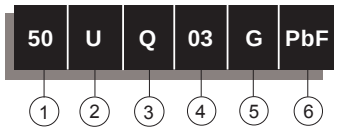
Marking Information

EXAMPLE: THIS IS A 50UQ03G WITH
LOT CODE 5K3A
ASSEMBLED ON WW 12, 2000
IN ASSEMBLY LINE "A"



Ordering Information Table

Device Code



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	-	• 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
IOR Rectifier

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05/06

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