

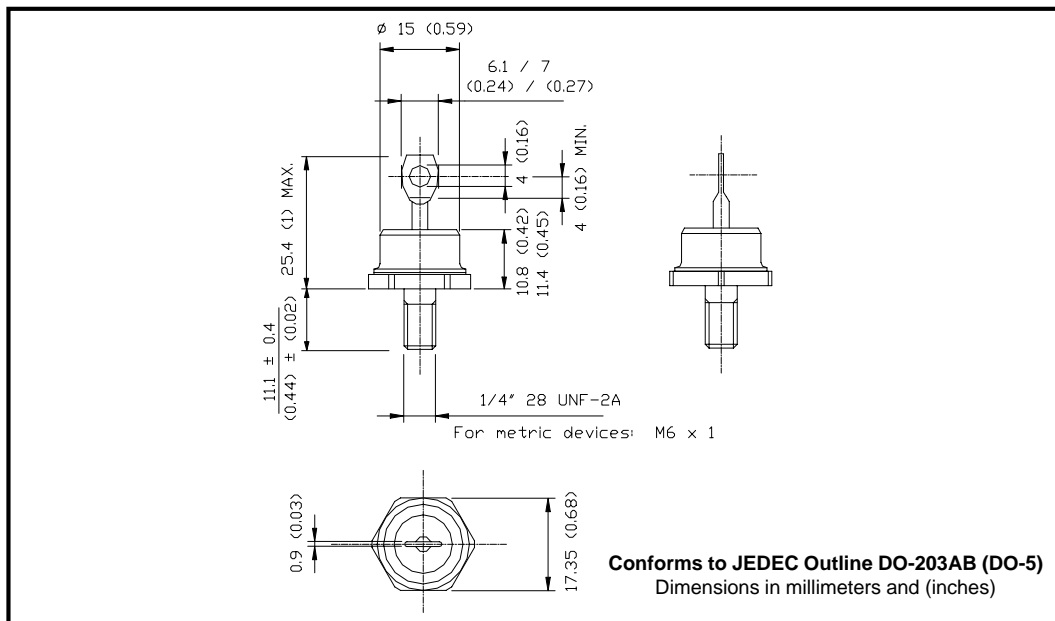
Major Ratings and Characteristics

Characteristics	51HQ...	Units
$I_{F(AV)}$ Rectangular waveform	60	A
V_{RRM} range	35 to 45	V
I_{FSM} @ $t_p=5\mu s$ sine	10,800	A
V_F @ 60 Apk, $T_J=125^\circ C$	0.58	V
T_J range	-65 to 150	$^\circ C$

Description/ Features

The 51HQ Schottky rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C T_J operation
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Hermetic packaging



51HQ... Series

Bulletin PD-2.021 rev. E 11/02

International
IR Rectifier

Voltage Ratings

Part number	51HQ035	51HQ040	51HQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	51HQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	60	A	50% duty cycle @ $T_C = 96^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	10,800	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse
	1150		
E_{AS} Non-Repetitive Avalanche Energy	81	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 12\text{ Amps}$, $L = 1.12\text{ mH}$
I_{AR} Repetitive Avalanche Current	12	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	51HQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1	0.65	V	@ 60A $T_J = 25^\circ\text{C}$
	0.83	V	@ 120A
	0.58	V	@ 60A $T_J = 125^\circ\text{C}$
	0.74	V	@ 120A
I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2	5	mA	$T_J = 25^\circ\text{C}$
	200	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
C_T Max. Junction Capacitance	2600	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance	7.5	nH	Measured from top of terminal to mounting plane
dv/dt Max. Voltage Rate of Change	10000	V/ μs	(Rated V_R)

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

Thermal-Mechanical Specifications

Parameters	51HQ	Units	Conditions
T_J Max. Junction Temperature Range	-65 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-65 to 150	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case	0.83	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.25	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	15 (0.53)	g (oz.)	
T Mounting Torque	Min.	23 (20)	Non-lubricated threads
	Max.	46 (40)	
Case Style	DO-203AB(DO-5)		JEDEC

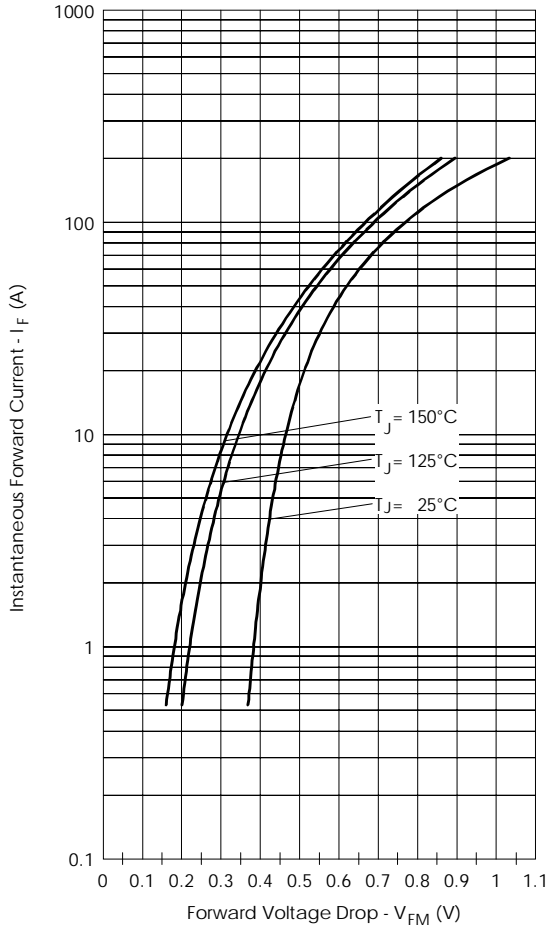


Fig. 1 - Maximum Forward Voltage Drop Characteristics

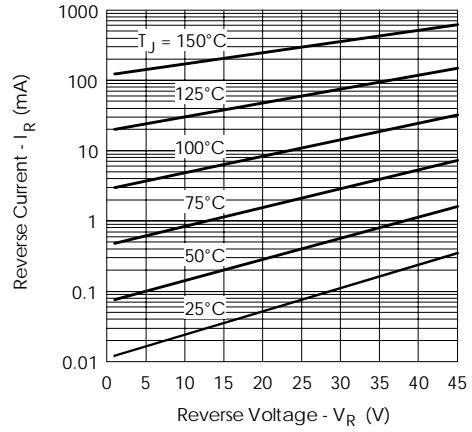


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

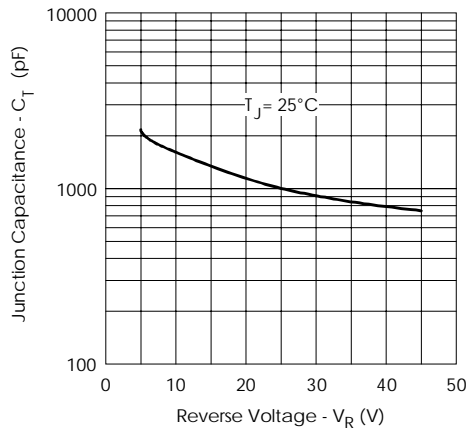


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

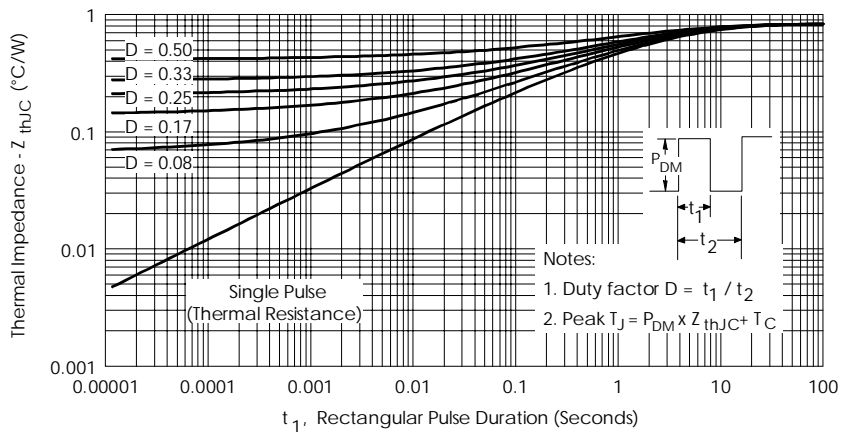


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

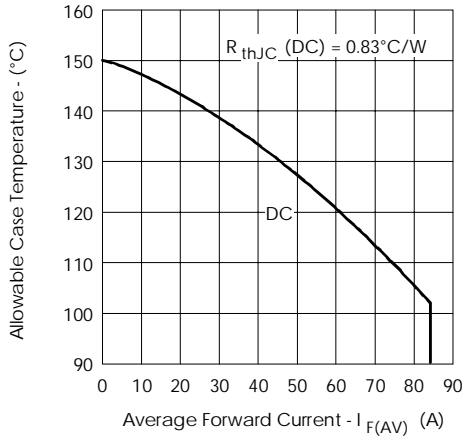


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

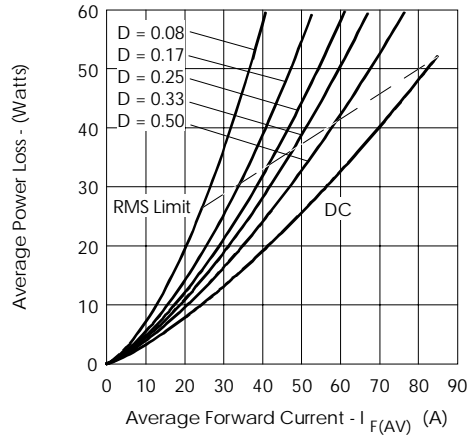


Fig. 6 - Forward Power Loss Characteristics

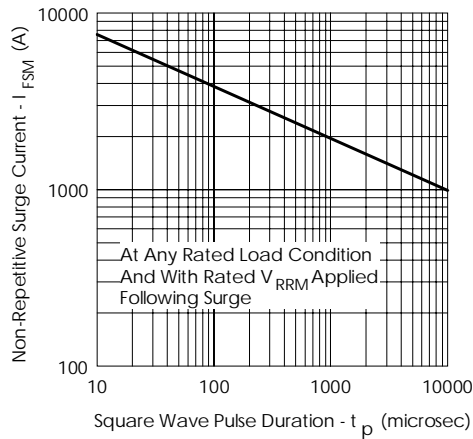


Fig. 7 - Maximum Non-Repetitive Surge Current

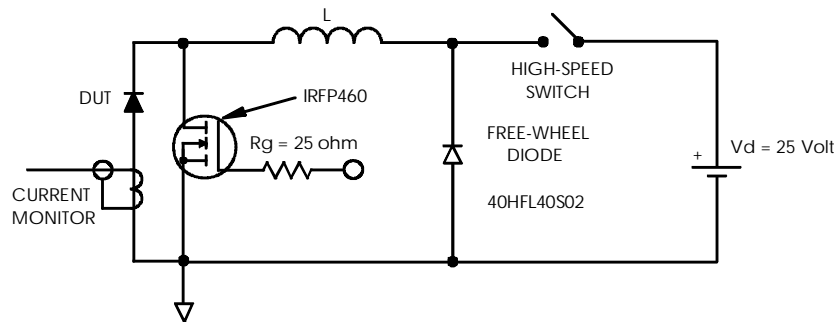


Fig. 8 - Unclamped Inductive Test Circuit

Data and specifications subject to change without notice.
This product has been designed for Industrial Level.
Qualification Standards can be found on IR's Web site.

International
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