Bulletin PD-20283 rev. A 05/02

International
IOR Rectifier

6TQ...
6TQ...S

SCHOTTKY RECTIFIER

6 Amp

$I_{F(AV)}$ = 6Amp
V_R = 35 to 45V

Major Ratings and Characteristics

Characteristics		6TQ	Units
$I_{F(AV)}$	Rectangular waveform	6	A
V_{RRM}	range	35 to 45	V
I_{FSM}	@tp = 5 µs sine	690	A
V_F	@6 Apk, T_J = 125°C	0.53	V
T_J	range	-55 to 175	°C

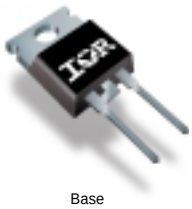
Description/Features

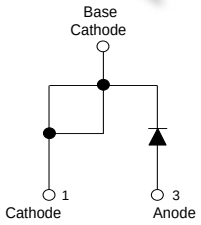
The 6TQ Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

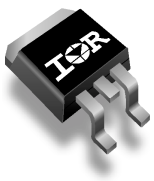
6TQ...

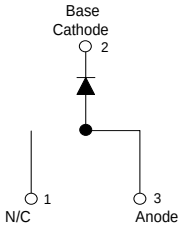




TO-220

6TQ... S





D^2PAK

Voltage Ratings

	Part number	6TQ035	6TQ040	6TQ045
V_R	Max. DC Reverse Voltage (V)	35	40	45
V_{RWM}	Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

	Parameters	6TQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 5	6	A	50% duty cycle @ T_C = 164° C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	690	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		140		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	8	mJ	T_J = 25 °C, I_{AS} = 1.20 Amps, L = 11.10 mH	
I_{AR}	Repetitive Avalanche Current	1.20	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	6TQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1) * See Fig. 1	0.60	V	@ 6A	T_J = 25 °C
		0.73	V	@ 12A	
		0.53	V	@ 6A	T_J = 125 °C
		0.64	V	@ 12A	
I_{RM}	Max. Reverse Leakage Current (1) * See Fig. 2	0.8	mA	T_J = 25 °C	V_R = rated V_R
		7	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.35	V	T_J = T_J max.	
r_t	Forward Slope Resistance	18.23	mΩ		
C_T	Max. Junction Capacitance	400	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25 °C	
L_S	Typical Series Inductance	8.0	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change	10000	V/ µs	(Rated V_R)	

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

Thermal-Mechanical Specifications

	Parameters		6TQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 175	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 175	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case		2.2	°C/W	DC operation * See Fig. 4
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°C/W	Mounting surface , smooth and greased
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		

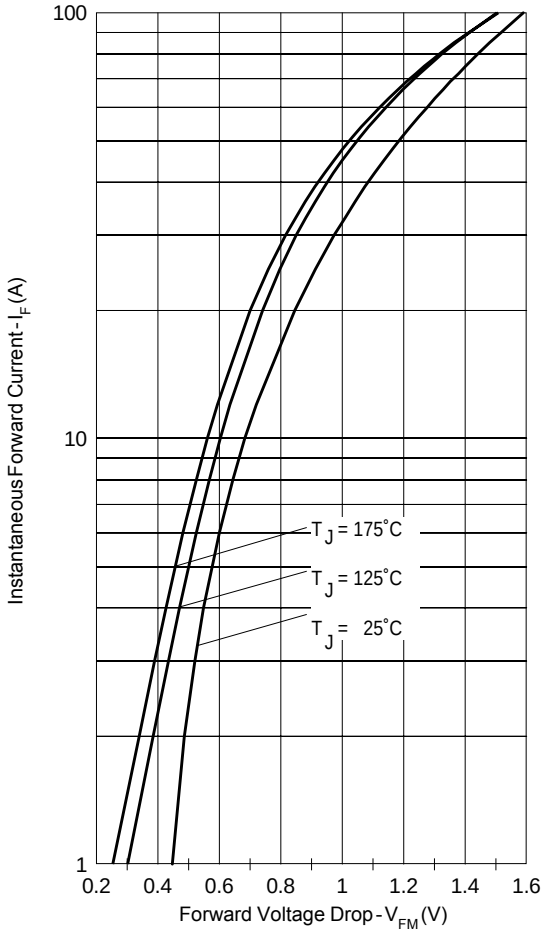


Fig. 1 - Maximum Forward Voltage Drop Characteristics

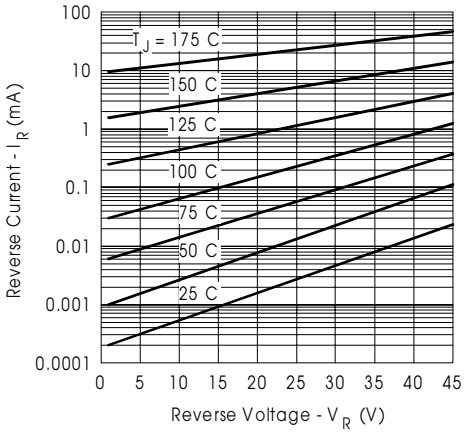


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

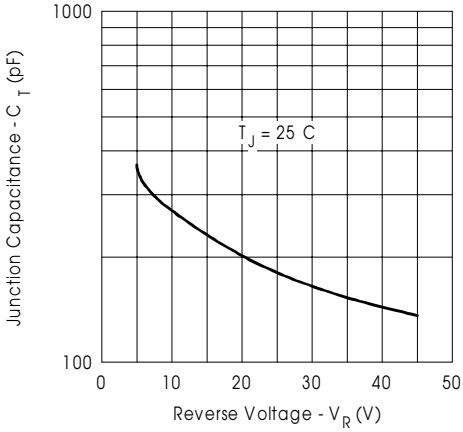


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

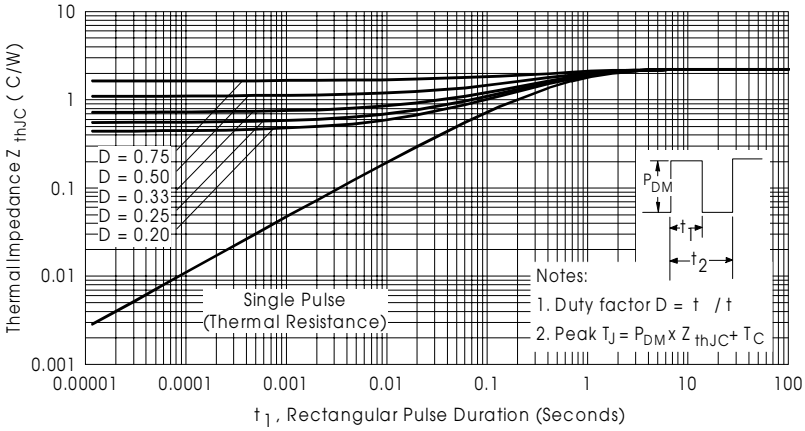


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

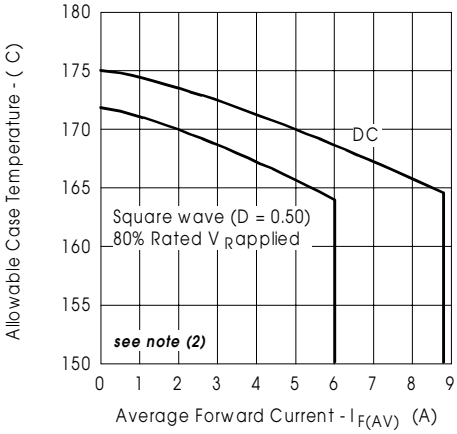


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

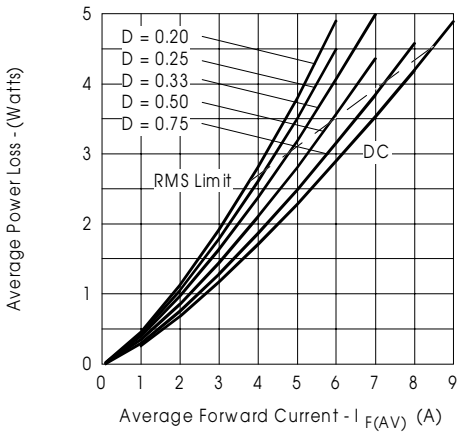


Fig. 6 - Forward Power Loss Characteristics

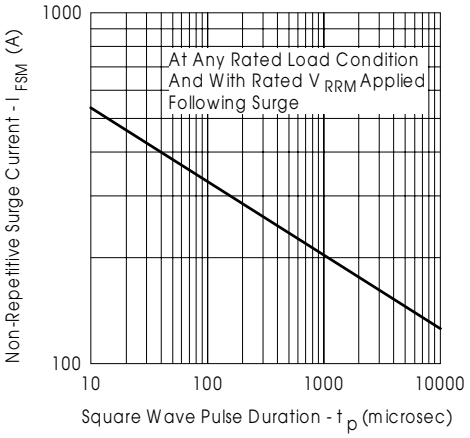


Fig. 7 - Maximum Non-Repetitive Surge Current

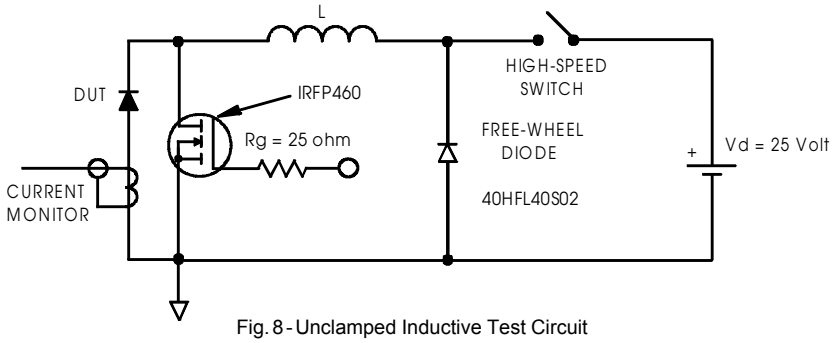
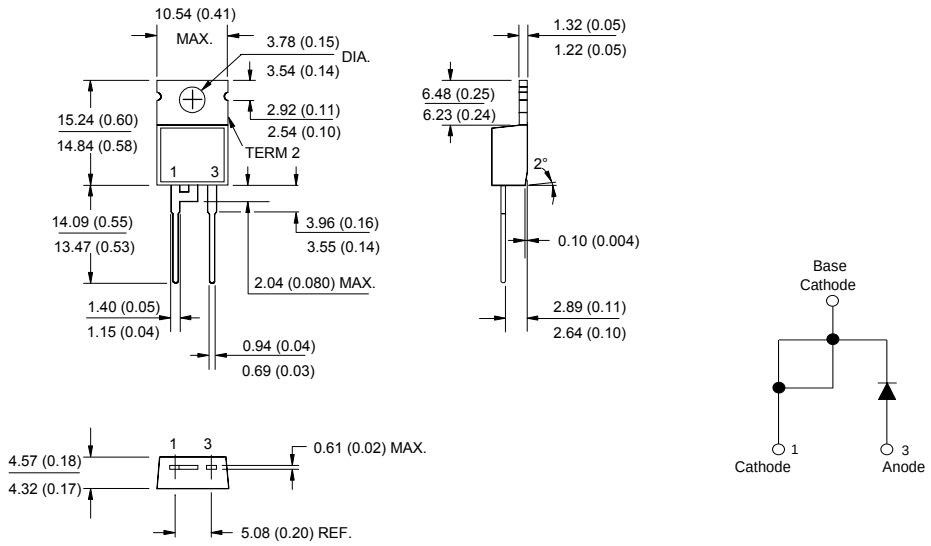


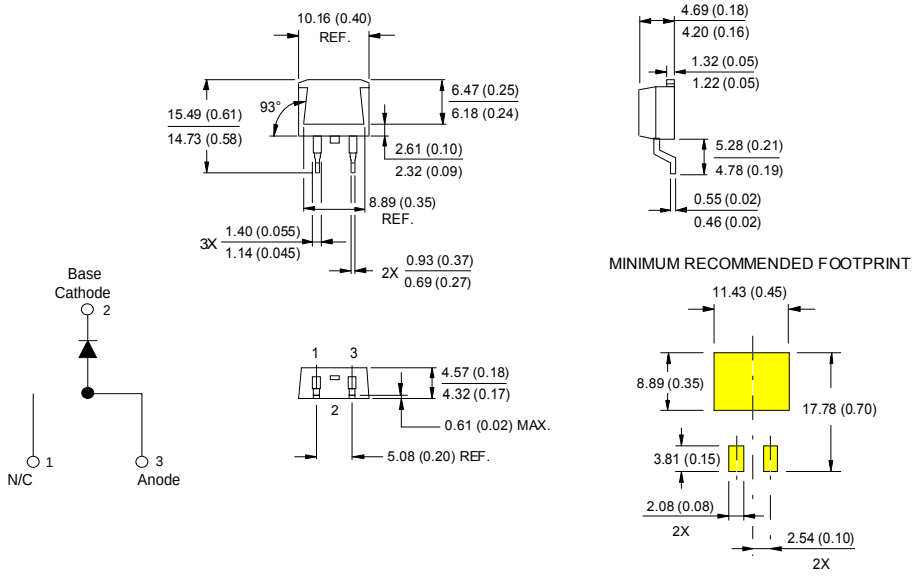
Fig. 8 - Unclamped Inductive Test Circuit

(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



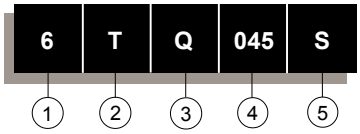
Conform to JEDEC outline TO-220AC
Dimensions in millimeters and (inches)



Conform to JEDEC outline D^2Pak (SMD-220)
Dimensions in millimeters and (inches)

Ordering Information Table

Device Code



1	-	Essential Part Number	
2	-	T = TO-220	
3	-	Q = Schottky Q Series	
4	-	Voltage Rating	035 = 35V 040 = 40V 045 = 45V
5	-	S = D^2Pak	

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

International
IOR Rectifier

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