



6TQ...
6TQ...S

SCHOTTKY RECTIFIER

6 Amp

$I_{F(AV)} = 6\text{Amp}$
 $V_R = 35/45\text{V}$

Major Ratings and Characteristics


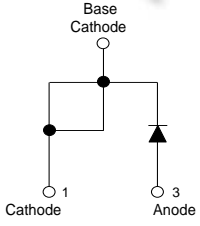

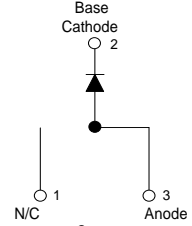
Characteristics	6TQ	Units
$I_{F(AV)}$ Rectangular waveform	6	A
V_{RRM} range	35/45	V
I_{FSM} @tp=5µs sine	690	A
V_F @6Apk, $T_J = 125^\circ\text{C}$	0.53	V
T_J range	-55 to 175	$^\circ\text{C}$

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...	6TQ... S
  TO-220	  D²PAK

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 @ $T_C = 164^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	690	A	5 μs Sine or 3 μs Rect. pulse
	140		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	8	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1.20$ 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. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	6TQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1	0.60	V	@ 6A
	0.73	V	@ 12A
	0.53	V	@ 6A
	0.64	V	@ 12A
I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2	0.8	mA	$T_J = 25^\circ\text{C}$
	7	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.35	V	$T_J = T_J$ max.
r_f Forward Slope Resistance	18.23	m Ω	
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 < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	6TQ	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case	2.2	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C/W}$	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)	
Marking Device	6TQ045		Case Style TO-220
	6TQ045S		Case Style D ² Pak

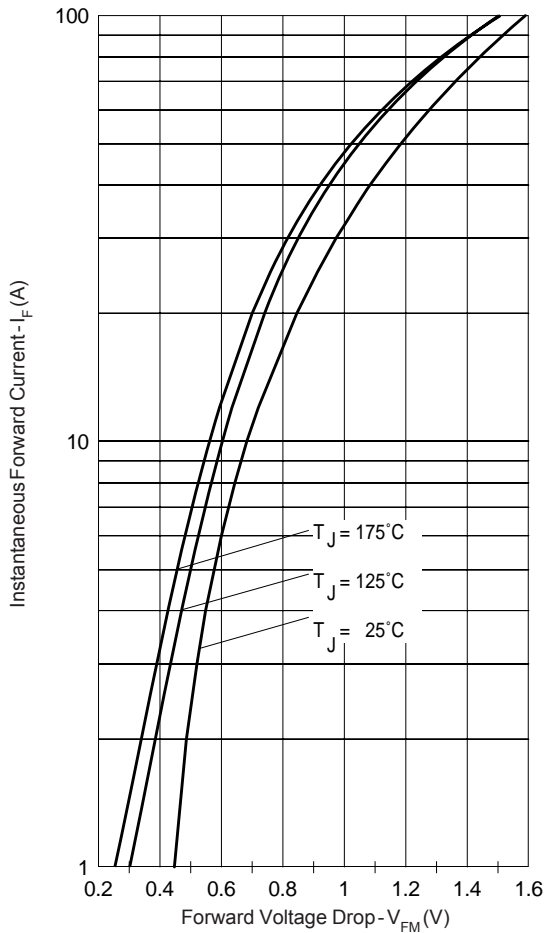


Fig. 1 - Maximum Forward Voltage Drop Characteristics

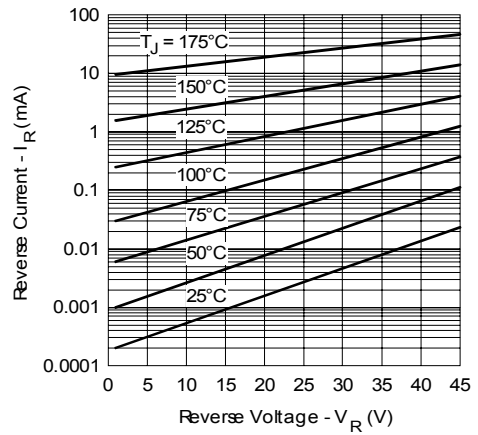


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

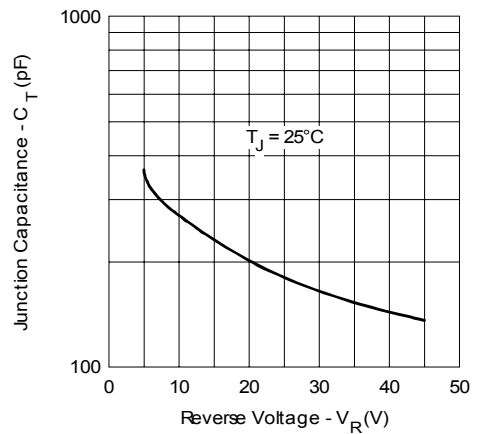


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

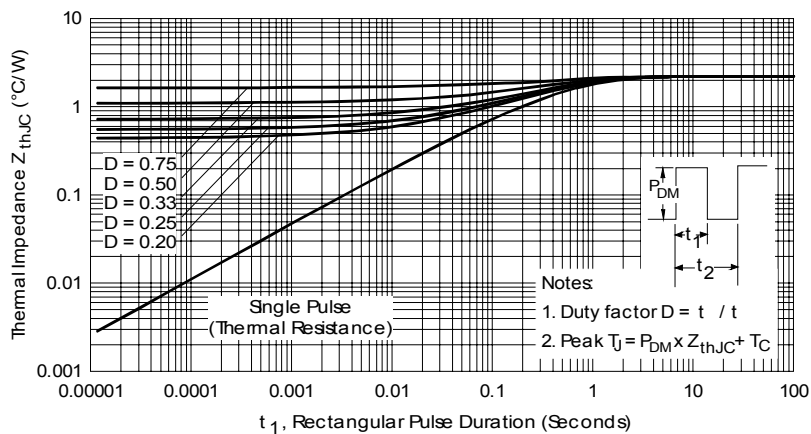


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

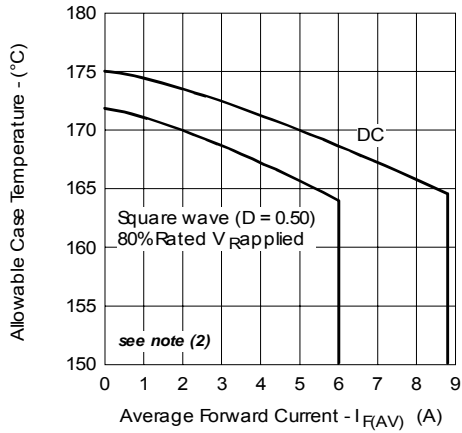


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

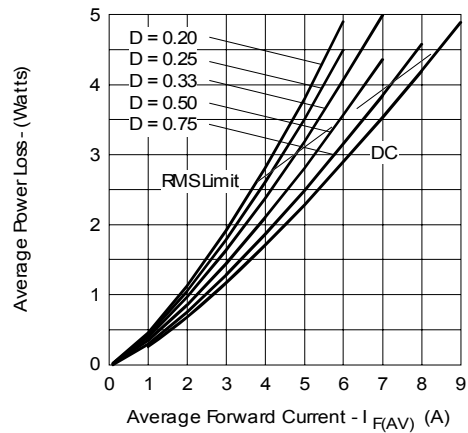


Fig. 6 - Forward Power Loss Characteristics

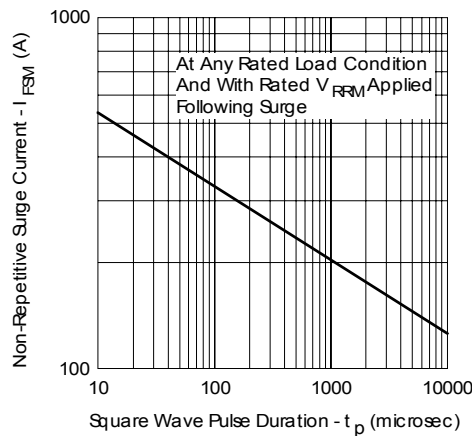


Fig. 7 - Maximum Non-Repetitive Surge Current

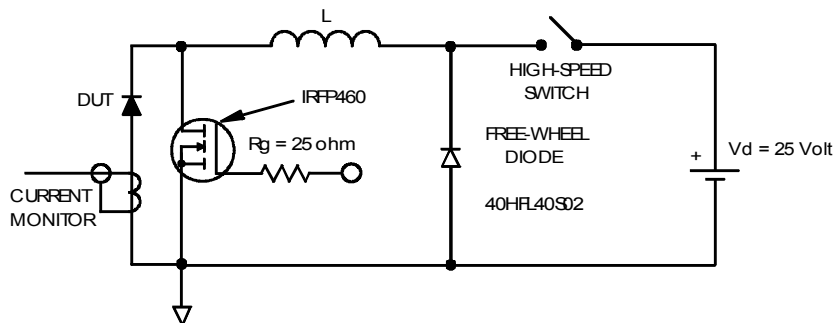


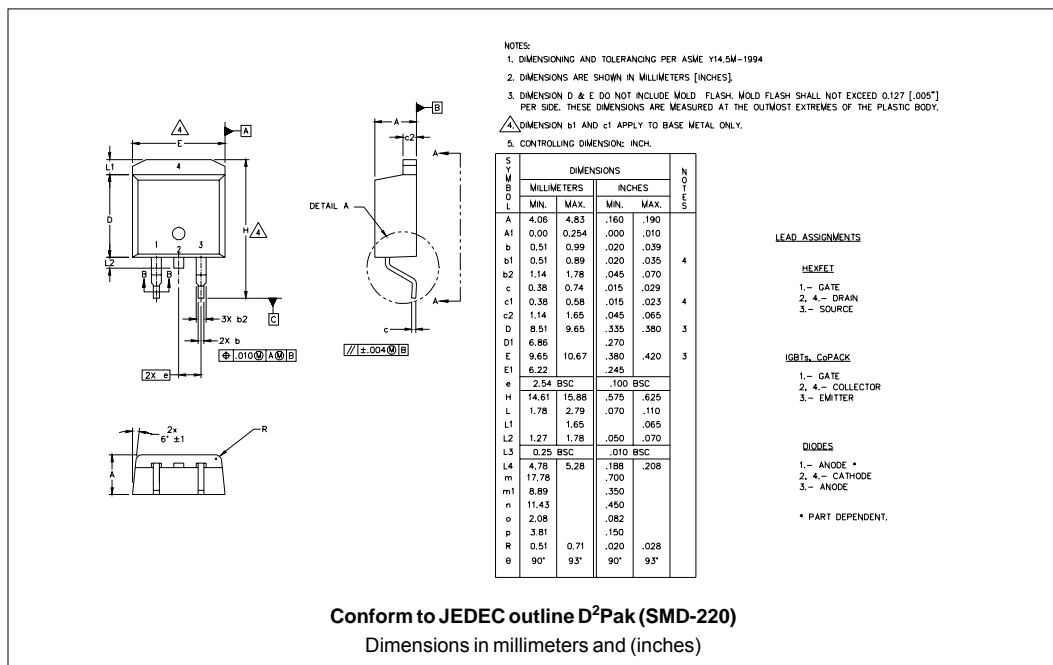
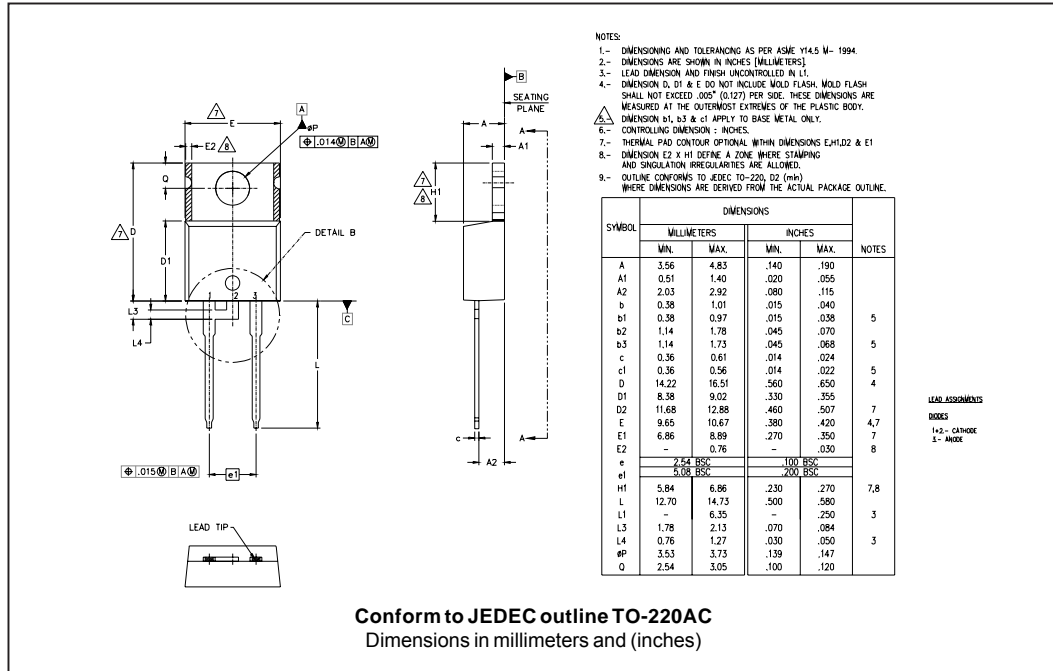
Fig. 8 - Unclamped Inductive Test Circuit

(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 = $V_{R1} \times I_{R1} (1-D)$; $I_{R1} @ V_{R1} = 80\%$ rated V_R

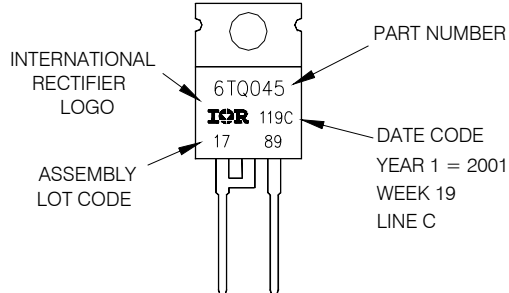
Outline Table



Part Marking Information

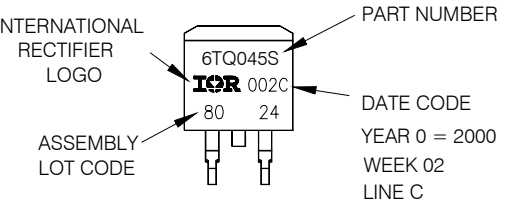
TO-220AC

EXAMPLE: THIS IS A 6TQ045
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"

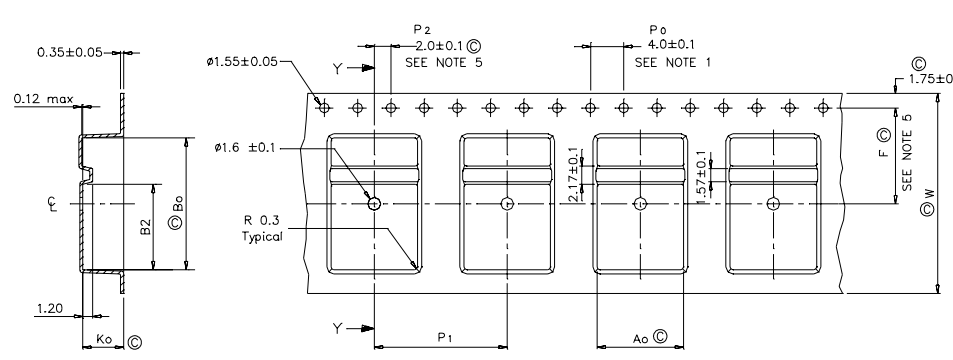


D²Pak

EXAMPLE: THIS IS A 6TQ045S
LOT CODE 8024
ASSEMBLED ON WW 02, 2000



Tape & Reel Information



SECTION Y-Y

Ao	10.50	+/-	0.1
Bo	15.80	+/-	0.1
B2	10.25	+/-	0.1
Ko	4.90	+/-	0.1
F	11.50	+/-	0.1
P1	16.00	+/-	0.1
W	24.00	+/-	0.3

NOTES:

- 1.0 10 SPROCKET HOLE PITH CUMULATIVE TOLERANCE ±.02
- 2.0 CAMBER NOT TO EXCEED 1mm In 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENIC ALLOY
- 4.0 Ko MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
- 5.0 MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF POCKET
- 6.0 VENDOR: (OPTIONAL)
- 7.0 MUST ALSO MEET REQUIREMENTS OF EIA STANDAR #EIA-481A TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT
- 8.0 SURFACE RESISTIVITY OF MOLDED MATL. MUST MEASURE LESS OR EQUAL TO 10⁶ OHMS PER SQUARE. MEASURED IN ACCORDANCE TO PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991
- 9.0 TOTAL LENGTH PER REEL MUST BE 45 METERS
- 10.0 © CRITICAL

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code								
6	T	Q	045	S	-			
(1)	(2)	(3)	(4)	(5)	(6)			
1	- Current Rating (6 = 6A)							
2	- Package T = TO-220							
3	- Schottky "Q" Series							
4	- Voltage Ratings							
5	<ul style="list-style-type: none"> • none = TO-220 • S = D²Pak 							
6	<ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free 							
<table border="1" style="margin-left: auto;"> <tr> <td>035 = 35V</td> </tr> <tr> <td>040 = 40V</td> </tr> <tr> <td>045 = 45V</td> </tr> </table>						035 = 35V	040 = 40V	045 = 45V
035 = 35V								
040 = 40V								
045 = 45V								
Tube Standard Pack Quantity : 50 pieces								

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.