

$$I_{F(AV)} = 15\text{Amp}$$

$$V_R = 35/ 45\text{V}$$

**Major Ratings and Characteristics**

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	15	A
$V_{RRM}$ range	35/ 45	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	990	A
$V_F$ @ 15 Apk, $T_J = 125^\circ\text{C}$	0.50	V
$T_J$ range	-55 to 150	$^\circ\text{C}$

**Description/ Features**

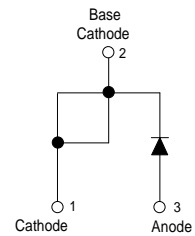
The 12TQ...PbF Schottky rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C  $T_J$  operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

**Case Styles**



TO-220AC



## Voltage Ratings

Part number	12TQ035PbF	12TQ040PbF	12TQ045PbF
$V_R$ Max. DC Reverse Voltage (V)	35	40	45
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)			

## Absolute Maximum Ratings

Parameters	12TQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	15	A	50% duty cycle @ $T_C = 120^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	990	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse
	250		10ms Sine or 6ms Rect. pulse
$E_{AS}$ Non-Repetitive Avalanche Energy	16	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 2.4$ Amps, $L = 5.5$ mH
$I_{AR}$ Repetitive Avalanche Current	2.4	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical

## Electrical Specifications

Parameters	12TQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) * See Fig. 1	0.56	V	@ 15A
	0.71	V	@ 30A
	0.50	V	@ 15A
	0.64	V	@ 30A
$I_{RM}$ Max. Reverse Leakage Current (1) * See Fig. 2	1.75	mA	$T_J = 25^\circ\text{C}$
	70	mA	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance	900	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance	8.0	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	10000	V/ $\mu\text{s}$	(Rated $V_R$ )

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

Parameters	12TQ	Units	Conditions
$T_J$ Max. Junction Temperature Range	-55 to 150	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case	2.0	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C}/\text{W}$	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	12TQ045		

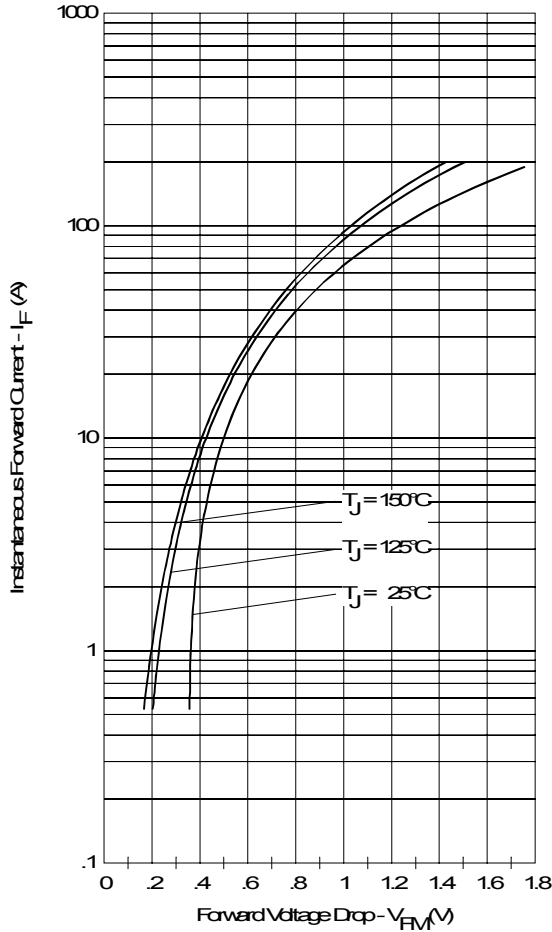


Fig. 1 - Maximum Forward Voltage Drop Characteristics

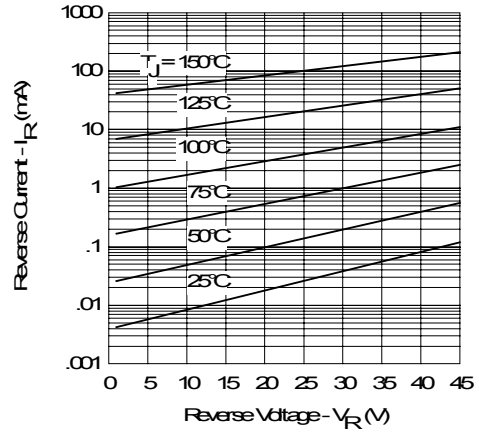


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

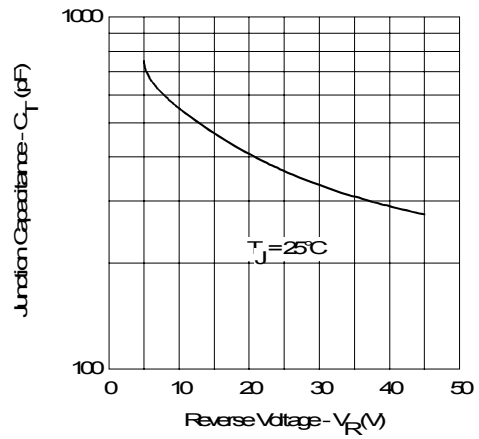


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

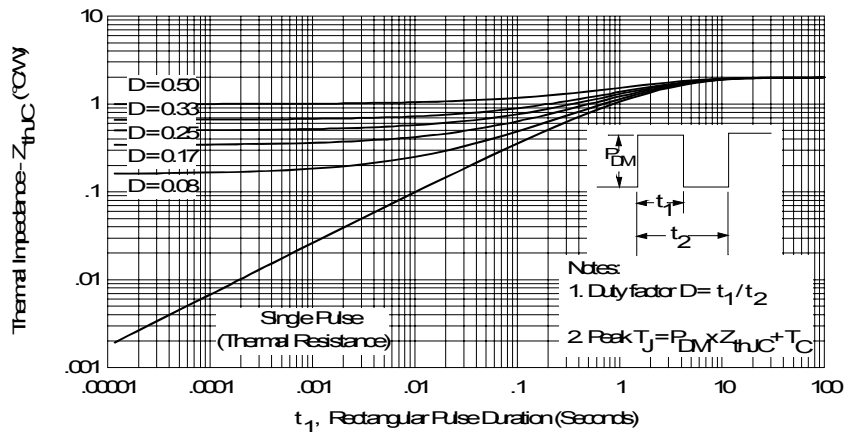


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

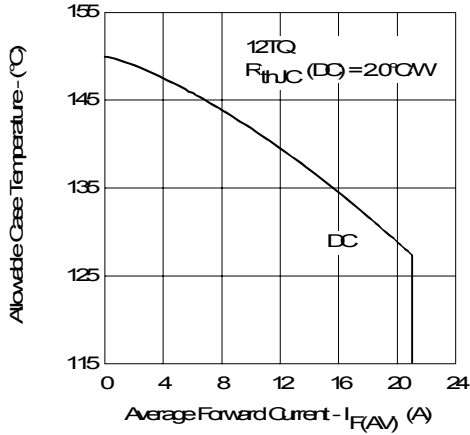


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

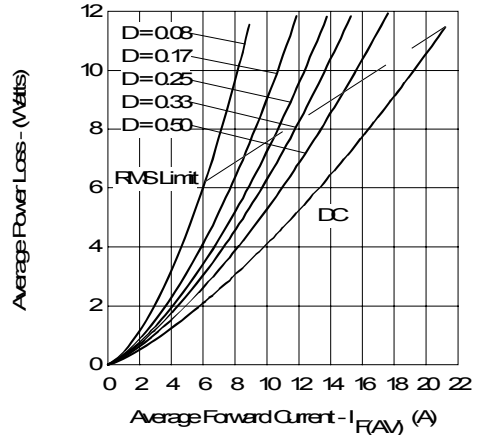


Fig. 6 - Forward Power Loss Characteristics

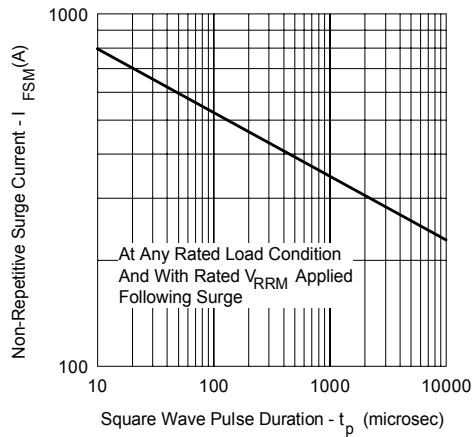


Fig. 7 - Maximum Non-Repetitive Surge Current

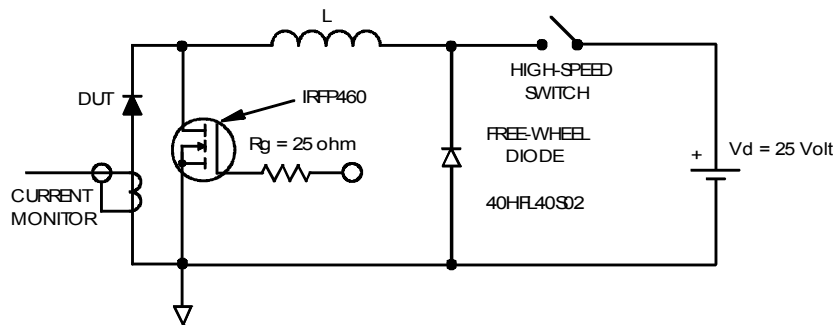
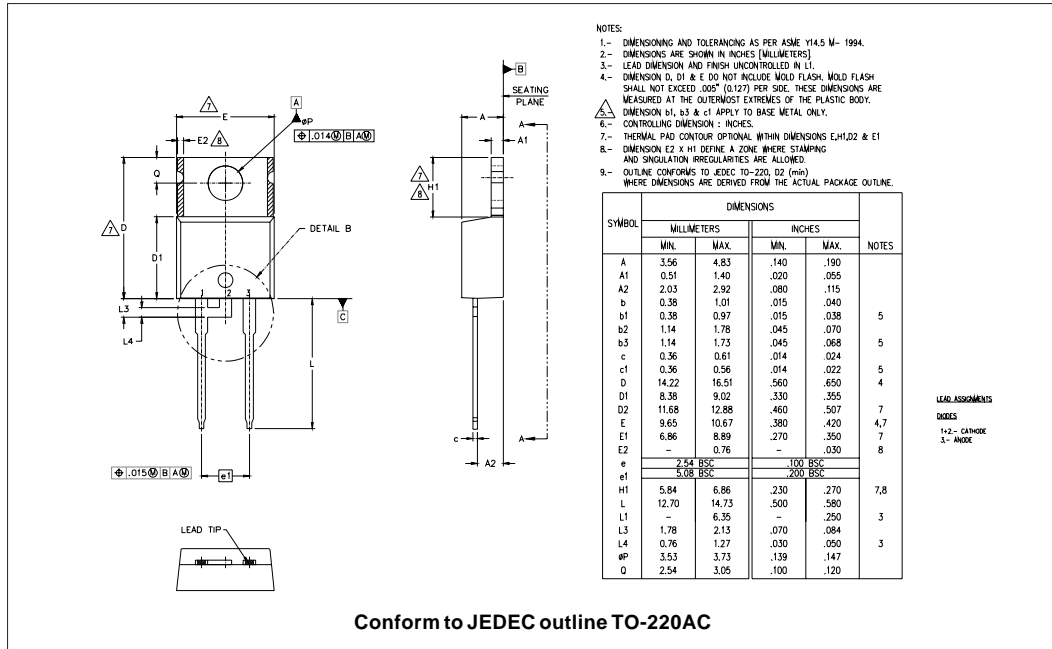
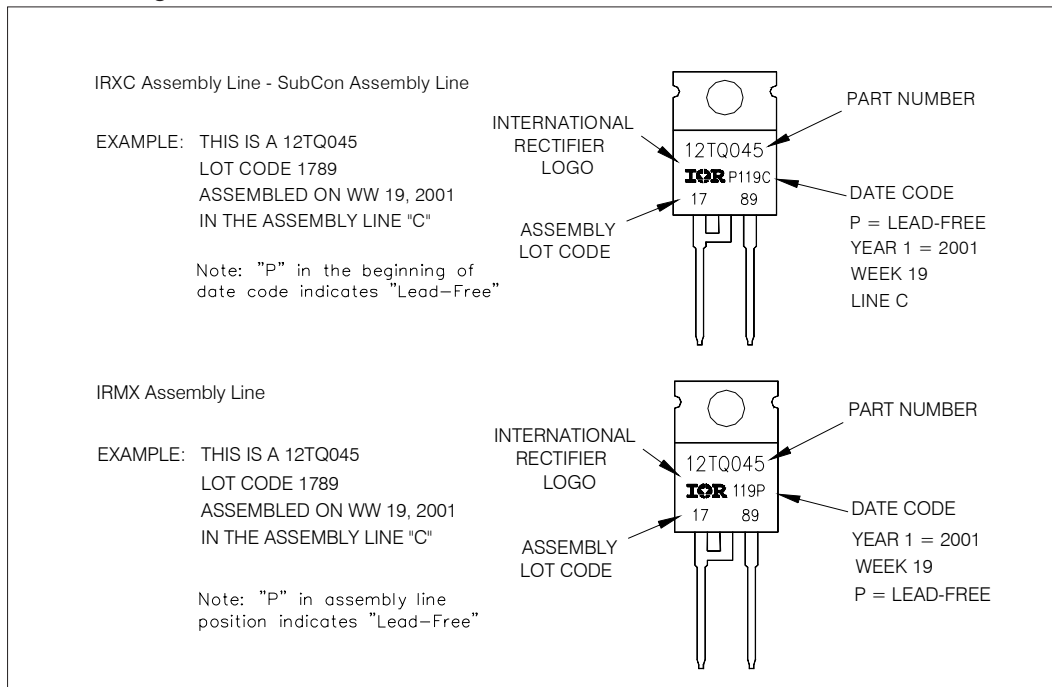


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



Part Marking Information



Ordering Information Table

Device Code				
<b>12</b>	<b>T</b>	<b>Q</b>	<b>045</b>	<b>PbF</b>
①	②	③	④	⑤
<b>1</b>	-	Current Rating (15A)		
<b>2</b>	-	Package T = TO-220		
<b>3</b>	-	Schottky "Q" Series		
<b>4</b>	-	Voltage Ratings		
<b>5</b>	-	<ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>		
			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 and Lead-Free.  
 Qualification Standards can be found on IR's Web site.