

International  
**IR** Rectifier

10TQ...  
 10TQ...S

SCHOTTKY RECTIFIER

10 Amp

$I_{F(AV)} = 10\text{Amp}$   
 $V_R = 35 \text{ to } 45\text{V}$

#### Major Ratings and Characteristics



Characteristics	10TQ	Units
$I_{F(AV)}$ Rectangular waveform	10	A
$V_{RRM}$	35 to 45	V
$I_{FSM}$ @ $t_p = 5\ \mu\text{s}$ sine	1050	A
$V_F$ @10 Apk, $T_J = 125^\circ\text{C}$	0.49	V
$T_J$ range	-55 to 175	$^\circ\text{C}$

#### Description/ Features

The 10TQ.. Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to  $175^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $175^\circ\text{C}$   $T_J$  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

10TQ...	10TQ... S
 <p>TO-220</p>	 <p>D²PAK</p>

## Voltage Ratings

Part number	10TQ035	10TQ040	10TQ045
$V_R$ Max. DC Reverse Voltage (V)	35	40	45
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)			

## Absolute Maximum Ratings

Parameters	10TQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	10	A	50% duty cycle @ $T_C = 151^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	1050	A	Following any rated load condition and with rated $V_{RRM}$ applied
	280		
$E_{AS}$ Non-Repetitive Avalanche Energy	13	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 2\text{Amps}$ , $L = 6.5\text{mH}$
$I_{AR}$ Repetitive Avalanche Current	2	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	10TQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) * See Fig. 1	0.57	V	@ 10A $T_J = 25^\circ\text{C}$
	0.67	V	@ 20A
	0.49	V	@ 10A $T_J = 125^\circ\text{C}$
	0.61	V	@ 20A
$I_{RM}$ Max. Reverse Leakage Current (1) * See Fig. 2	2	mA	$T_J = 25^\circ\text{C}$
	15	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$C_T$ 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 (Rated $V_R$ )	10,000	V/ $\mu\text{s}$	

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

## Thermal-Mechanical Specifications

Parameters	10TQ	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	2.0	$^\circ\text{C/W}$	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)	

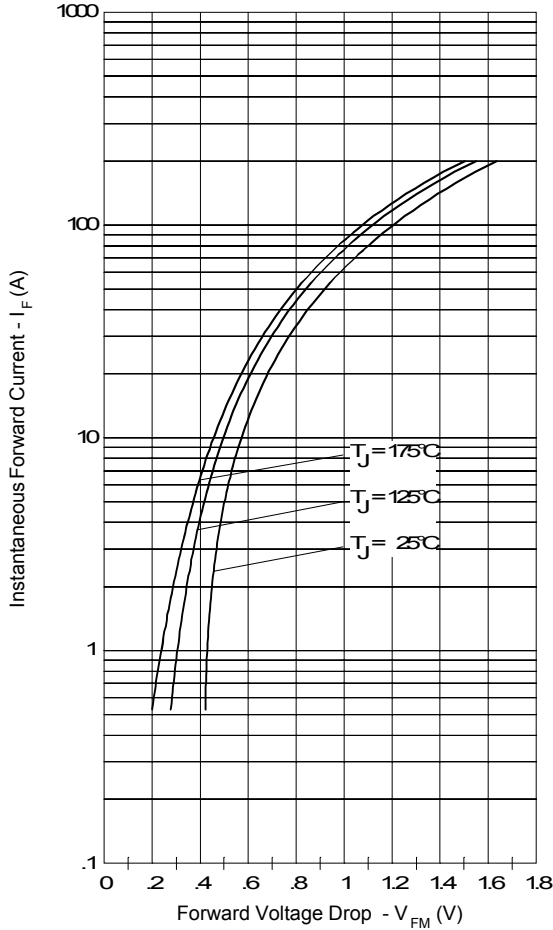


Fig. 1 - Maximum Forward Voltage Drop Characteristics

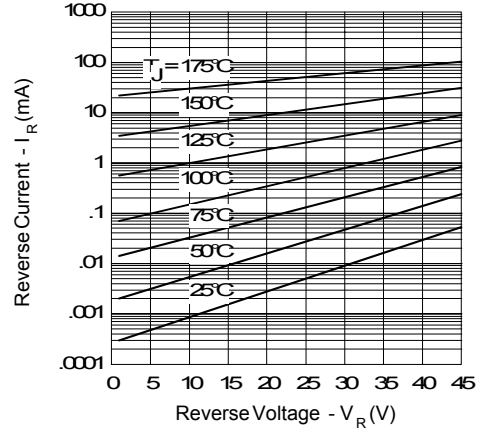


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

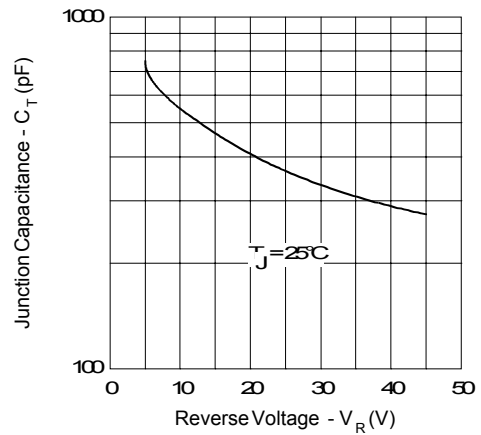


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

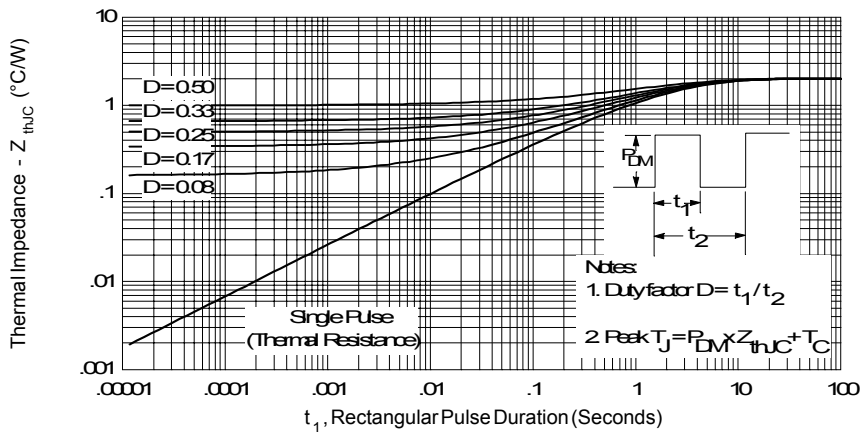


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

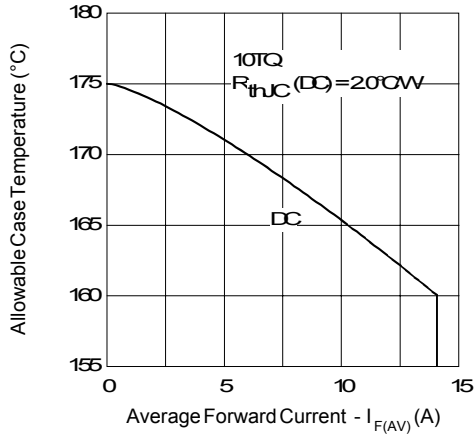


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

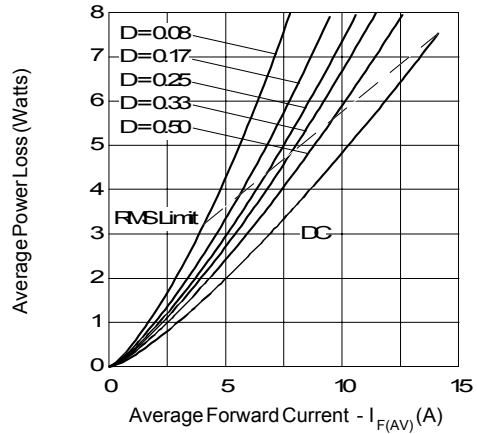


Fig. 6 - Forward Power Loss Characteristics

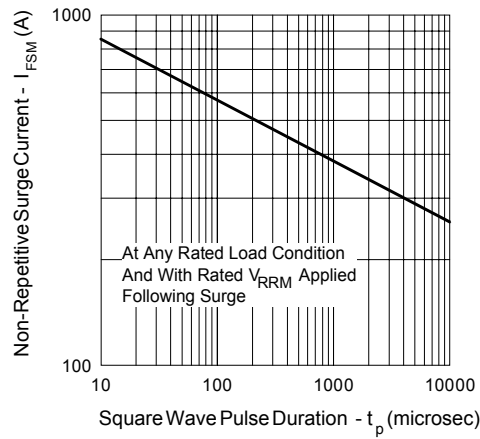


Fig. 7 - Maximum Non-Repetitive Surge Current

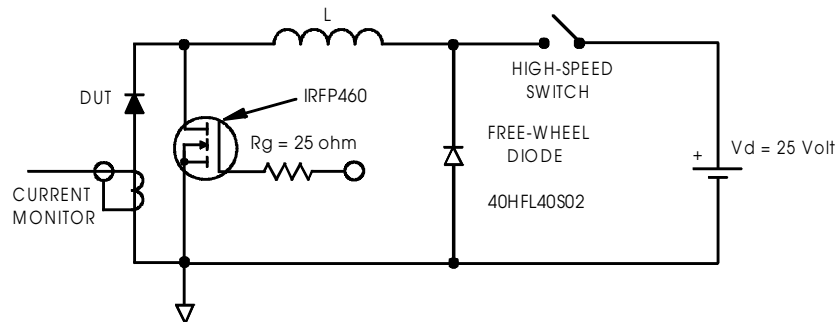
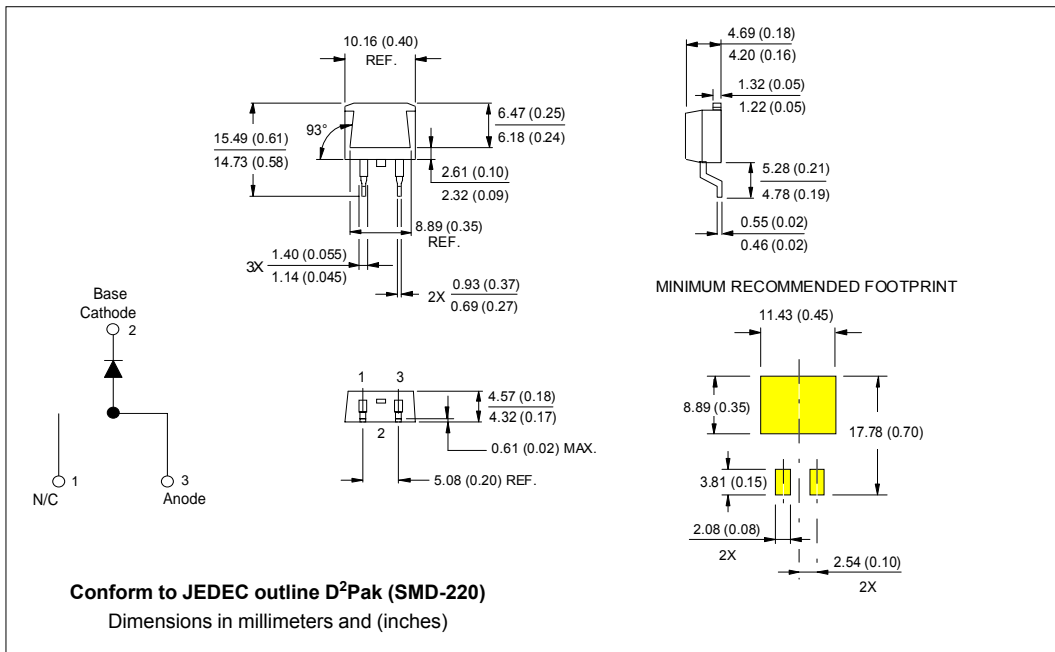
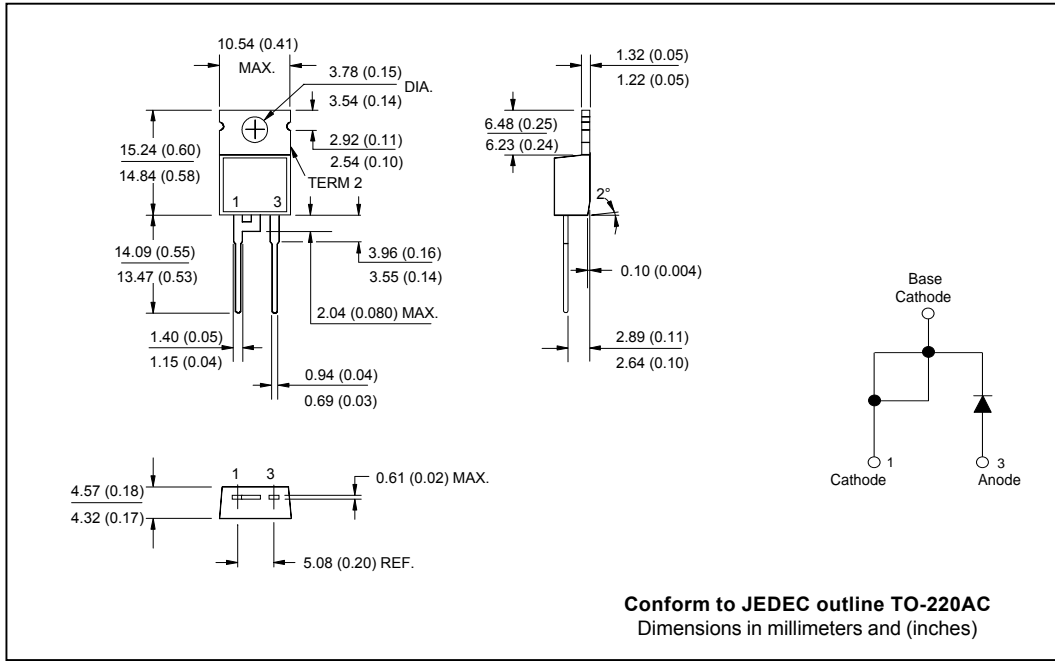


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



Ordering Information Table

**Device Code**

10	T	Q	045	S
①	②	③	④	⑤

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