

International
IR Rectifier

12TQ...
12TQ...S

SCHOTTKY RECTIFIER

15 Amp

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

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

Major Ratings and Characteristics

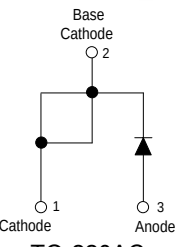
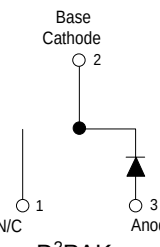
Characteristics	12TQ	Units
$I_{F(AV)}$ Rectangular waveform	15	A
V_{RRM} range	35 to 45	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ sine	990	A
V_F @ 15 Apk, $T_J = 125^\circ\text{C}$	0.50	V
T_J range	-55 to 150	$^\circ\text{C}$

Description/ Features

The 12TQ... 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

Case Styles

12TQ...	12TQ... S
 Base Cathode 2  1 Cathode 3 Anode TO-220AC	 Base Cathode 2  1 N/C 3 Anode D²PAK

Voltage Ratings

Part number	12TQ035	12TQ040	12TQ045
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 μs Sine or 3 μs Rect. pulse
	250		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	16	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 2.4\text{ Amps}$, $L = 5.5\text{ mH}$
I_{AR} Repetitive Avalanche Current	2.4	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	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°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)	10000	V/ μs	

(1) Pulse Width < 300 μs , 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	$^\circ\text{C/W}$	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)		

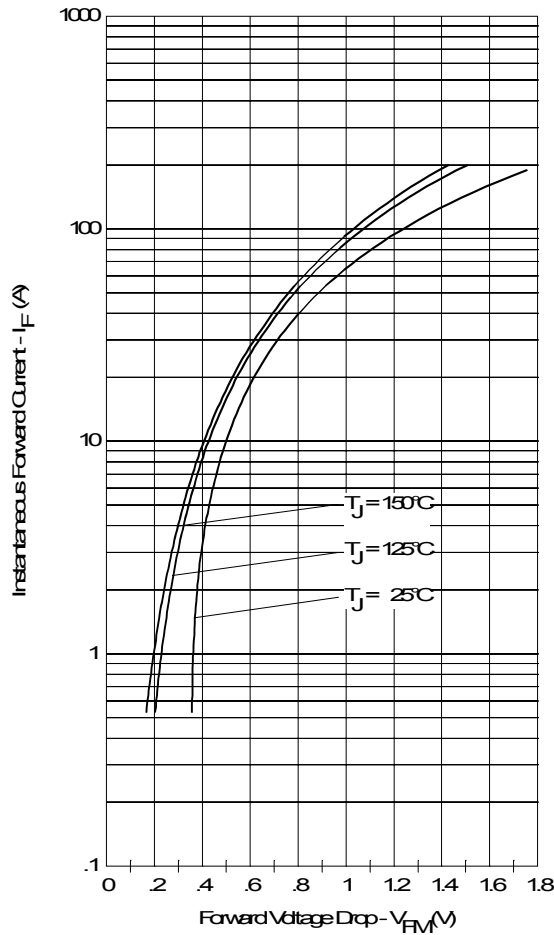


Fig. 1 - Maximum Forward Voltage Drop Characteristics

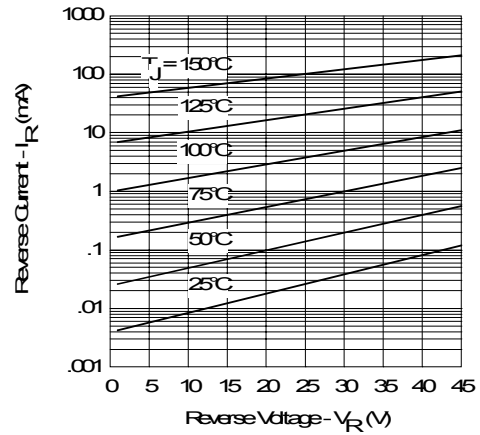


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

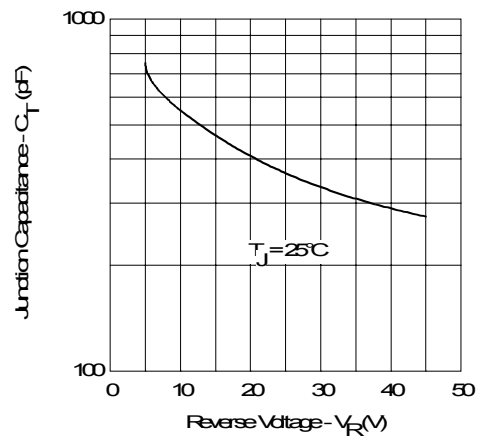


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

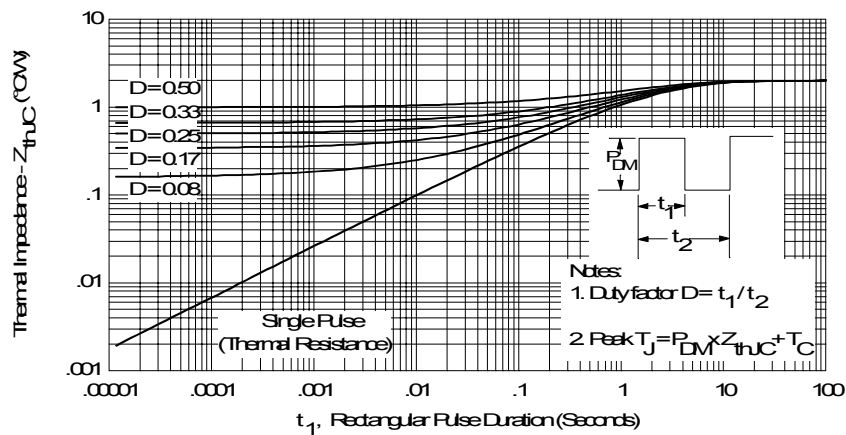


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

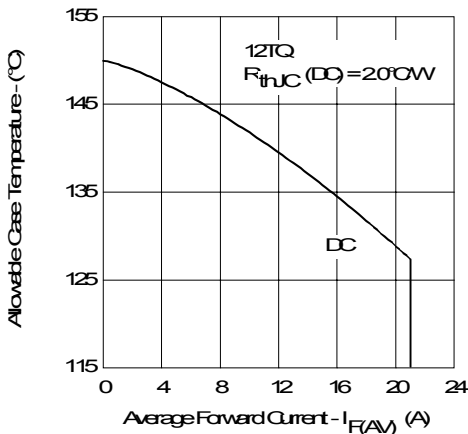


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

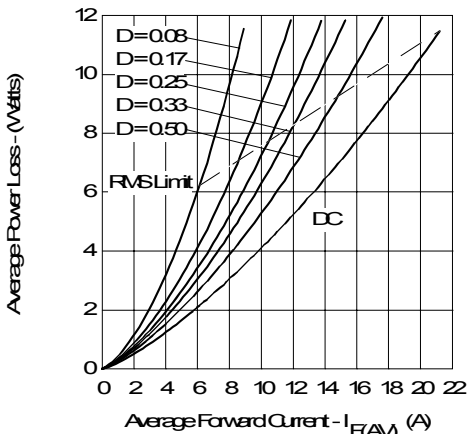


Fig. 6 - Forward Power Loss Characteristics

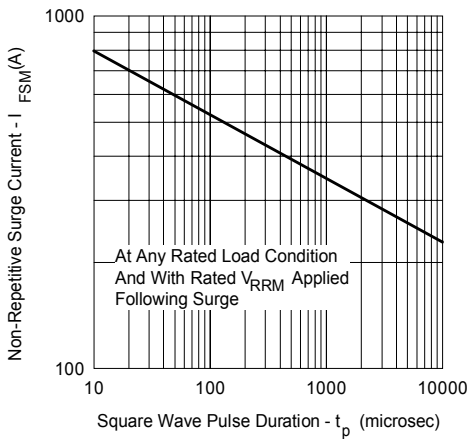


Fig. 7 - Maximum Non-Repetitive Surge Current

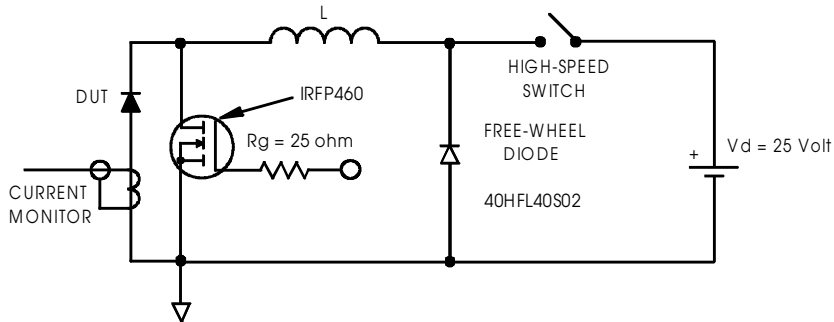
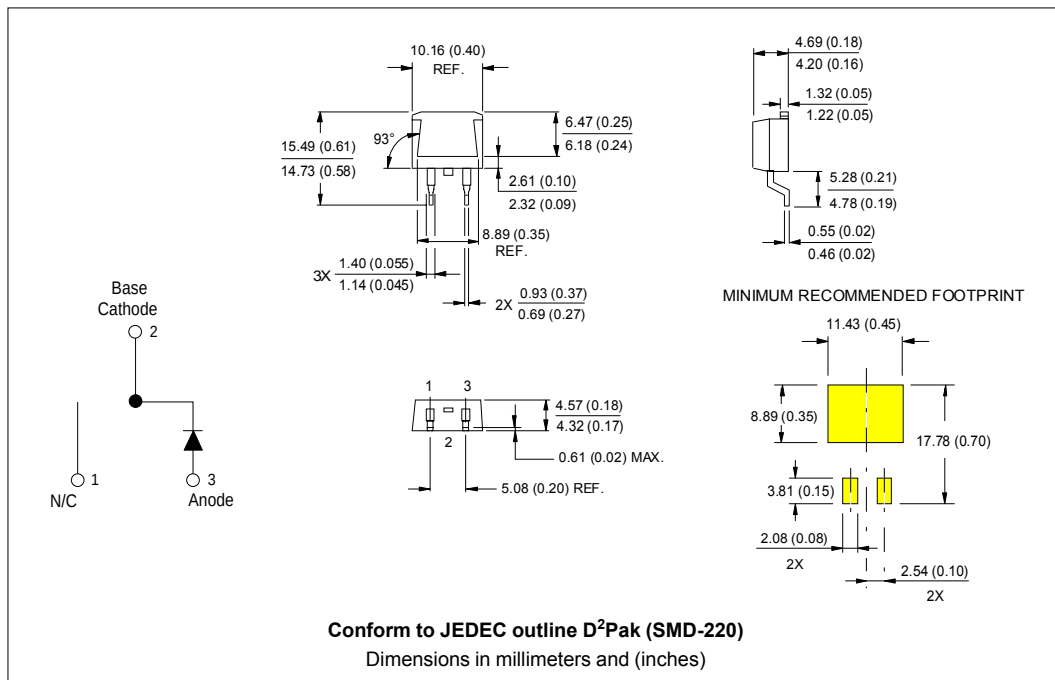
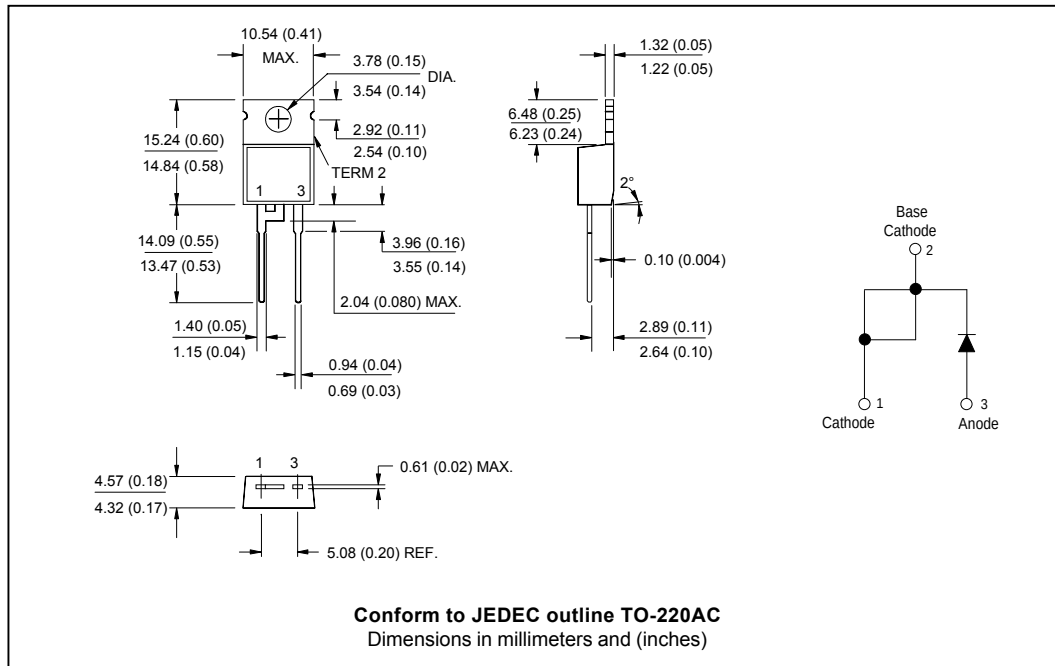


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

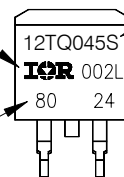


Marking Information

EXAMPLE: THIS IS A 12TQ045-S
LOT CODE 8024
ASSEMBLED ON WW 02, 2000
IN THE ASSEMBLY LINE "L"

INTERNATIONAL
RECTIFIER
LOGO

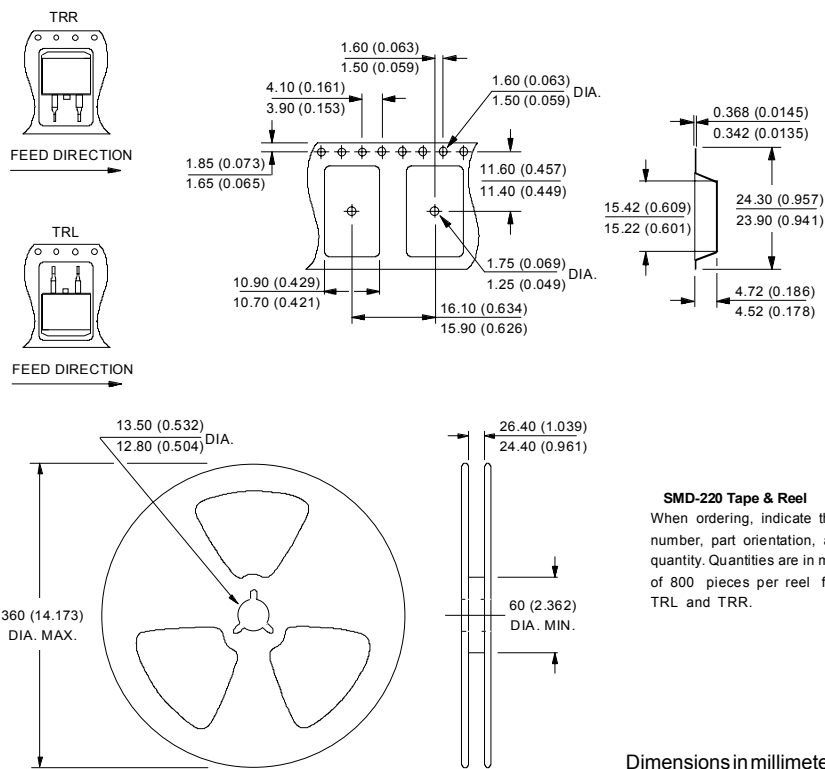
ASSEMBLY
LOT CODE



PART NUMBER

DATE CODE
YEAR 0 = 2000
WEEK 02
LINE L

Tape & Reel Information



Ordering Information Table

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

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.