

International
IOR Rectifier

25CTQ...
25CTQ...S
25CTQ.. -1

SCHOTTKY RECTIFIER

30 Amp

$I_{F(AV)} = 30\text{Amp}$ $V_R = 35 \text{ to } 45\text{V}$

Major Ratings and Characteristics

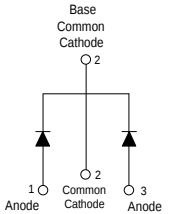
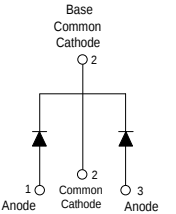
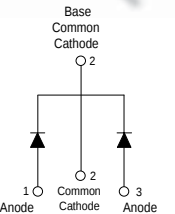
Characteristics	25CTQ	Units
$I_{F(AV)}$ Rectangular waveform	30	A
V_{RRM} range	35 to 45	V
I_{FSM} @tp = 5 μ s sine	990	A
V_F @ 15 Apk, T_J = 125°C (per leg)	0.50	V
T_J range	-55 to 150	°C

Description/ Features

The 25CTQ center tap 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
- Center tap TO-220 package
- 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

25CTQ...	25CTQ... S	25CTQ... -1
  TO-220	  D ² PAK	  TO-262

25CTQ... Series

Bulletin PD-20242 rev. B 07/03

International
IOR Rectifier

Voltage Ratings

Part number	25CTQ035	25CTQ040	25CTQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	25CTQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	30	A	50% duty cycle @ $T_C = 102^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * 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 (Per Leg)	20	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 3\text{Amps}$, $L = 4.40\text{mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	3	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	25CTQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.56	V	@ 15A
	0.71	V	@ 30A
	0.50	V	@ 15A
	0.64	V	@ 30A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.75	mA	$T_J = 25^\circ\text{C}$
	70	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	900	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	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	25CTQ	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 (Per Leg)	3.25	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.63	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	2.0 (0.07)	g (oz.)	
T Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)
	Max.	12 (10)	

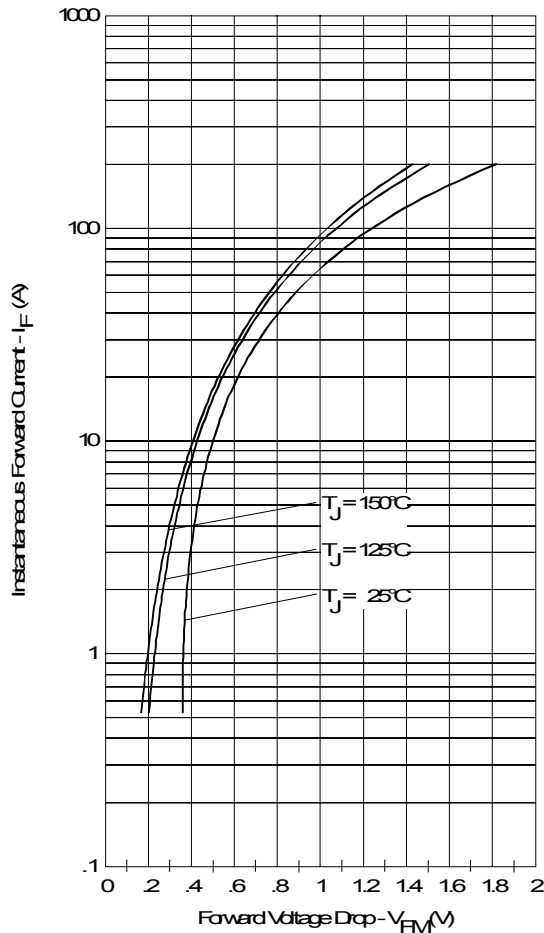


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

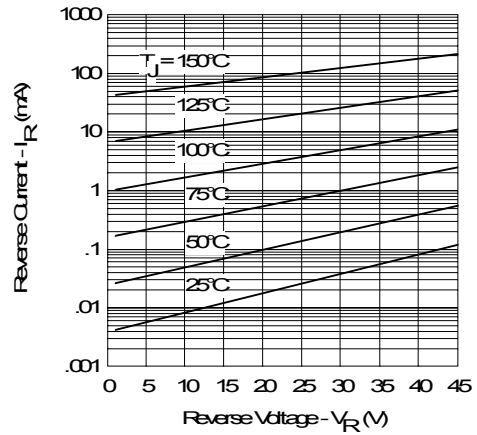


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

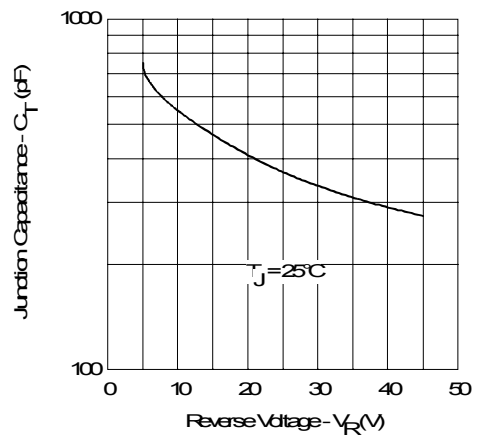


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

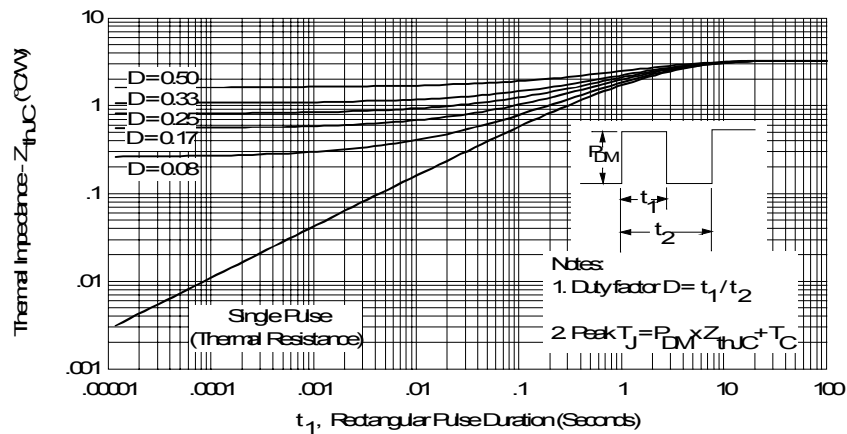


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

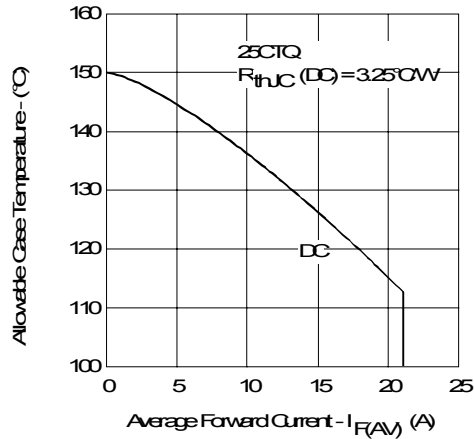


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

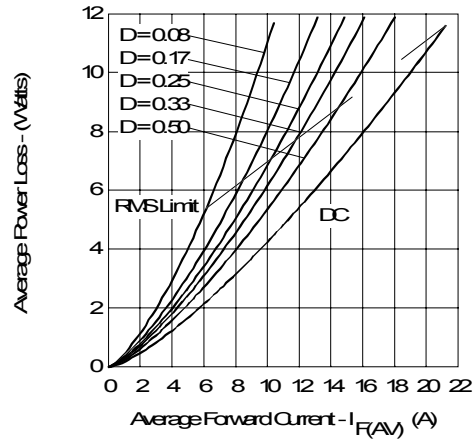


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

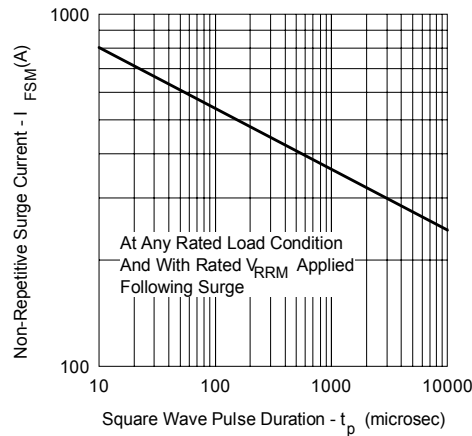


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

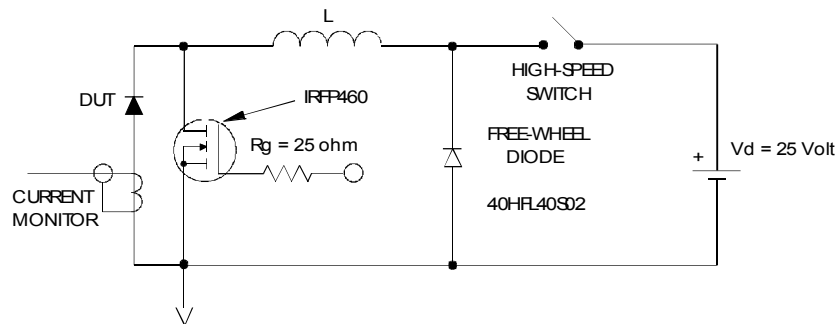
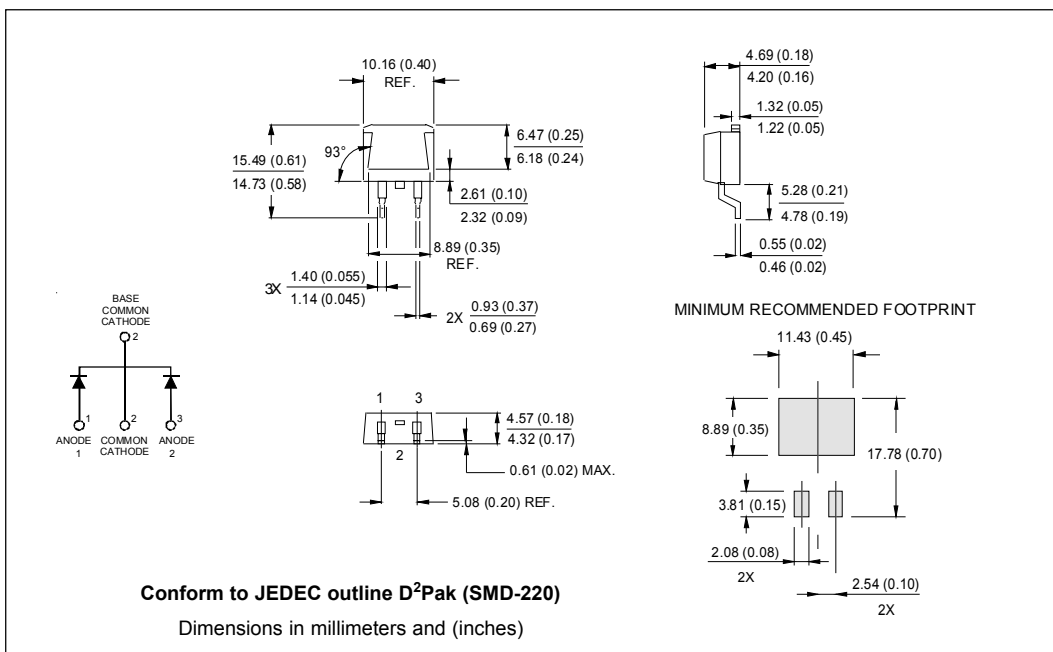
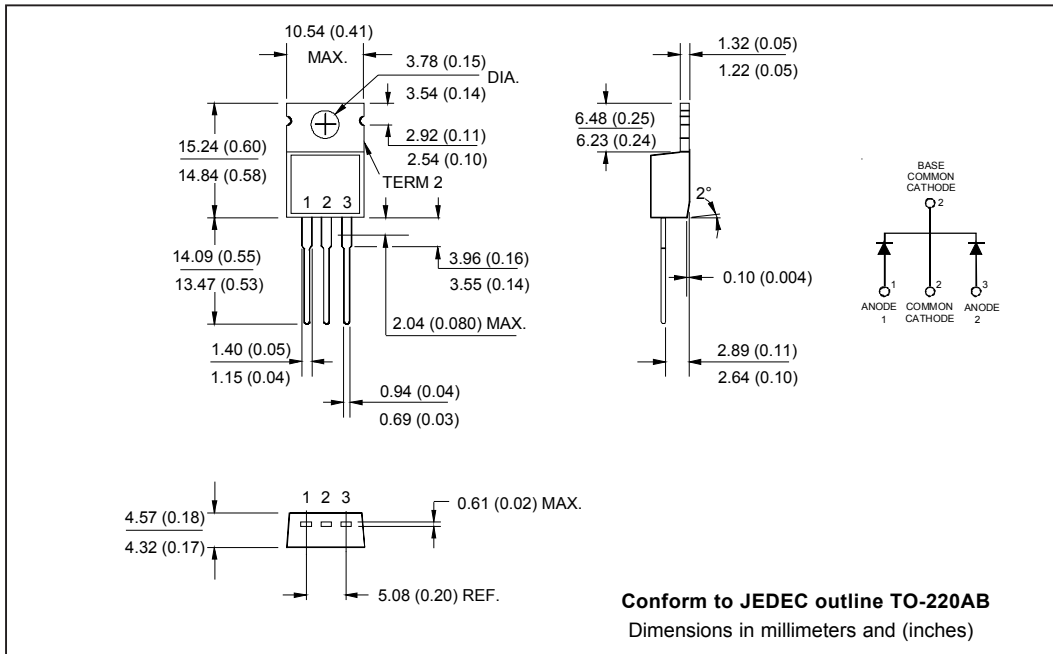
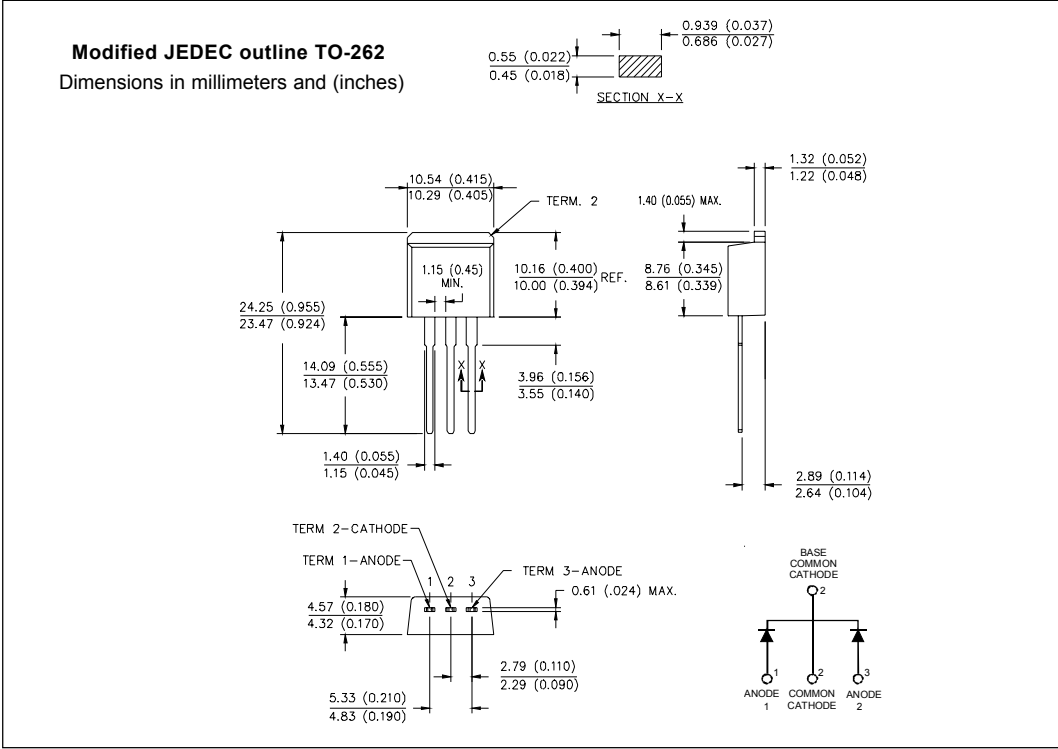


Fig. 8 - Unclamped Inductive Test Circuit

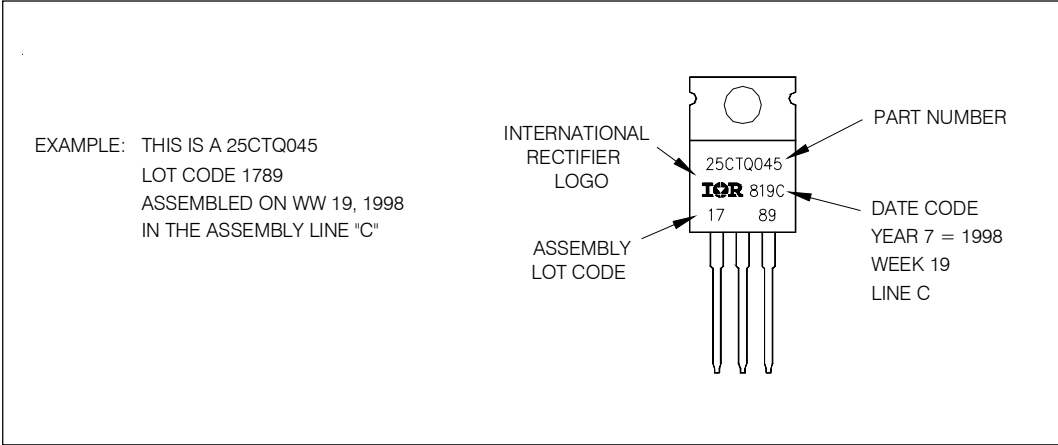
Outline Table



Outline Table



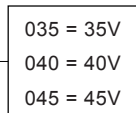
Marking Information



Tape & Reel Information



Ordering Information Table



25CTQ045

* This model has been developed by *

* Wizard SPICE MODEL GENERATOR (1999) *

* (International Rectifier Corporation) *

* Contain Proprietary Information *

* SPICE Model Diode is composed by a *

* simple diode plus paralld VCG2T *

.SUBCKT 25CTQ045 ANO CAT

D1 ANO 1 DMOD (0.07089)

*Define diode model

.MODEL DMOD D(IS=1.72789623043916E-04A,N=1.16449261507669,BV=52V,

+ IBV=0.347382965330896A,RS= 0.000623832,CJO=2.01681525450576E-08,

+ VJ=1.79426113441105,XTI=2, EG=0.778356513713514)

*Implementation of VCG2T

VX 1 2 DC 0V

R1 2 CAT TRES 1E-6

.MODEL TRES RES(R=1,TC1=30.866905105089)

$$GP1 \text{ ANO CAT VALUE} = \{-ABS(I(VX)) * (EXP(((((-2.873853E-03/30.86691) * ((V(2,CAT) * 1E6)/(I(VX) + 1E-6) - 1))) + 1) * 5.486216E-02 * ABS(V(ANO,CAT))) - 1\}$$

.ENDS 25CTQ045

Thermal Model Subcircuit

.SUBCKT 25CTQ045 5 1

CTHERM1 5 4 4.04E-01

CTHERM2 4 3 2.01E+00

CTHERM3 3 2 8.32E+00

CTHERM4 2 1 3.80E+02

R THERM1 5 4 1.62E+00

R THERM2 4 3 1.22E+00

R THERM1 3 2 3.50E-01

R THERM1 2 1 4.34E-02

.ENDS 25CTQ045

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
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105

TAC Fax: (310) 252-7309

Visit us at www.irf.com for sales contact information. 07/03