

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

**Major Ratings and Characteristics**

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	30	A
$V_{RRM}$ range	35/ 45	V
$I_{FSM}$ @ tp = 5 $\mu$ s sine	990	A
$V_F$ @ 15 Apk, $T_J=125^\circ\text{C}$ (per leg)	0.50	V
$T_J$ range	-55 to 150	$^\circ\text{C}$

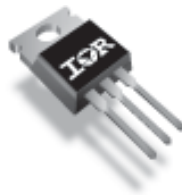
**Description/ Features**

The 25CTQ...PbF 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 $^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

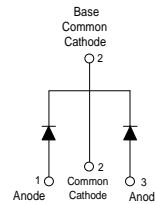
- 175 $^\circ\text{C}$   $T_J$  operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

**Case Styles**

25CTQ...PbF



TO-220



### Voltage Ratings

Part number	25CTQ035PbF	25CTQ040PbF	25CTQ045PbF
$V_R$ 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	Following any rated load condition and with rated $V_{RWM}$ applied
	250		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	20	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 3$ Amps, $L = 4.40$ mH
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	3	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	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) $25^\circ\text{C}$
$L_S$ 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/ $\mu\text{s}$	

(1) Pulse Width < 300 $\mu\text{s}$ , 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)	
Marking Device	25CTQ045		

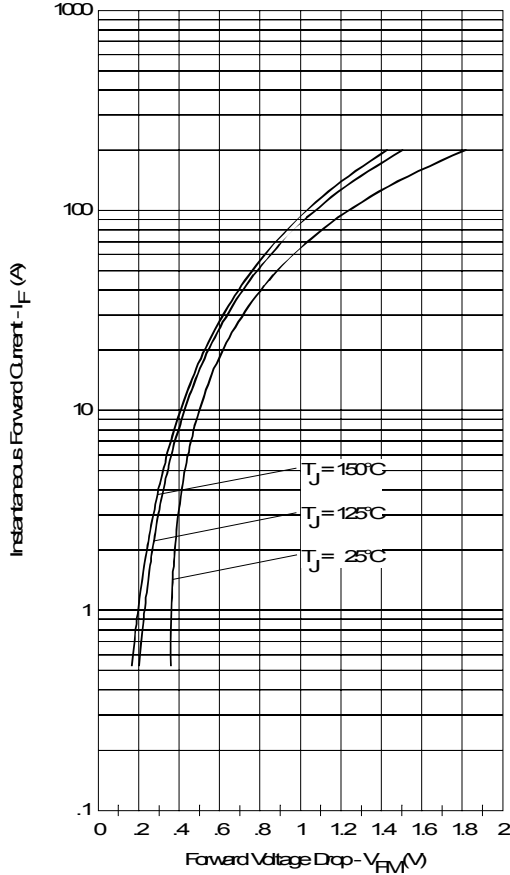


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

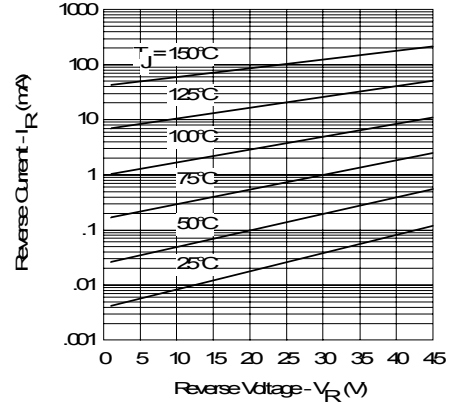


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

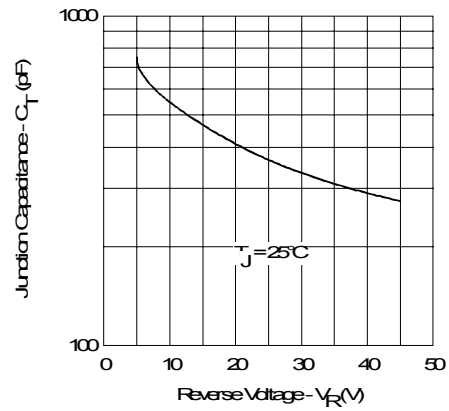


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

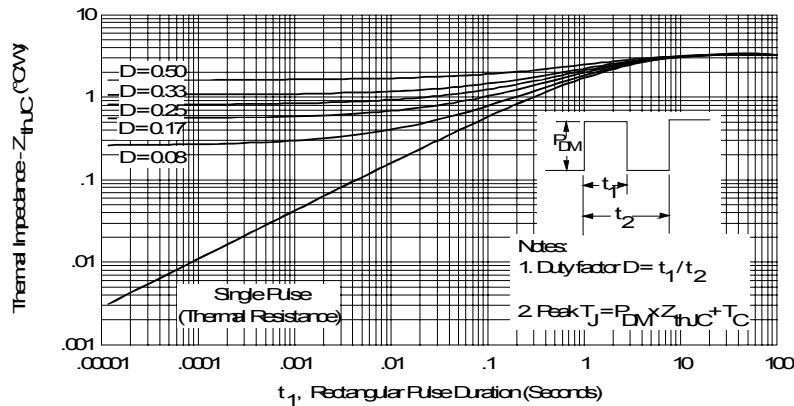


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

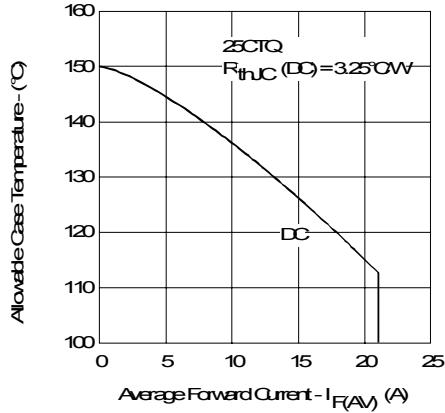


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

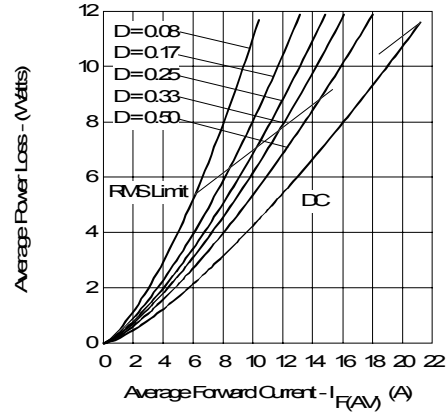


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

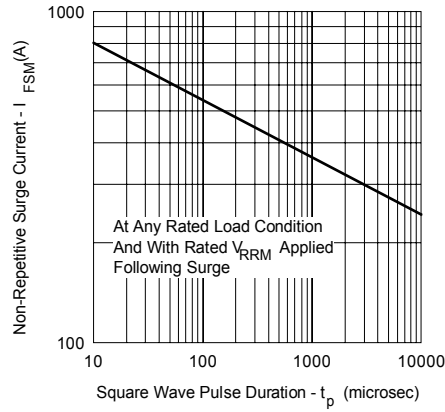


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

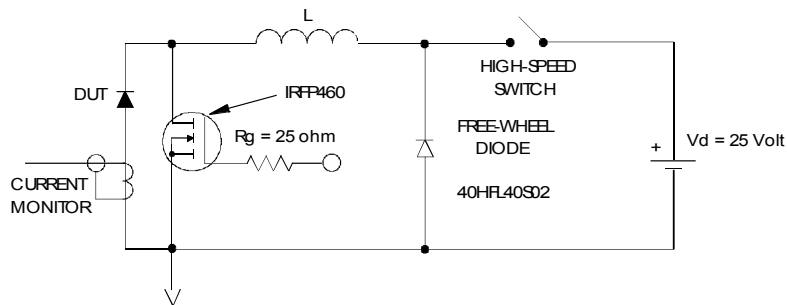
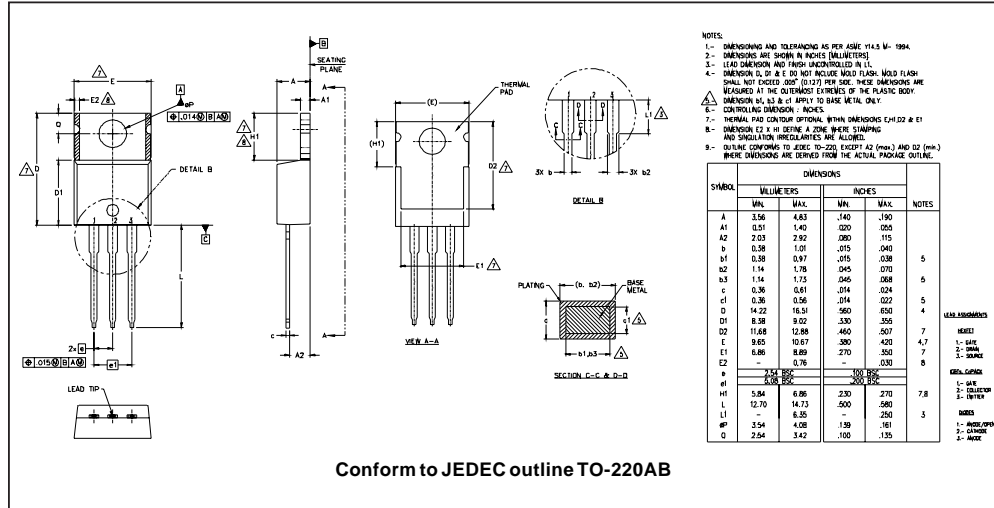
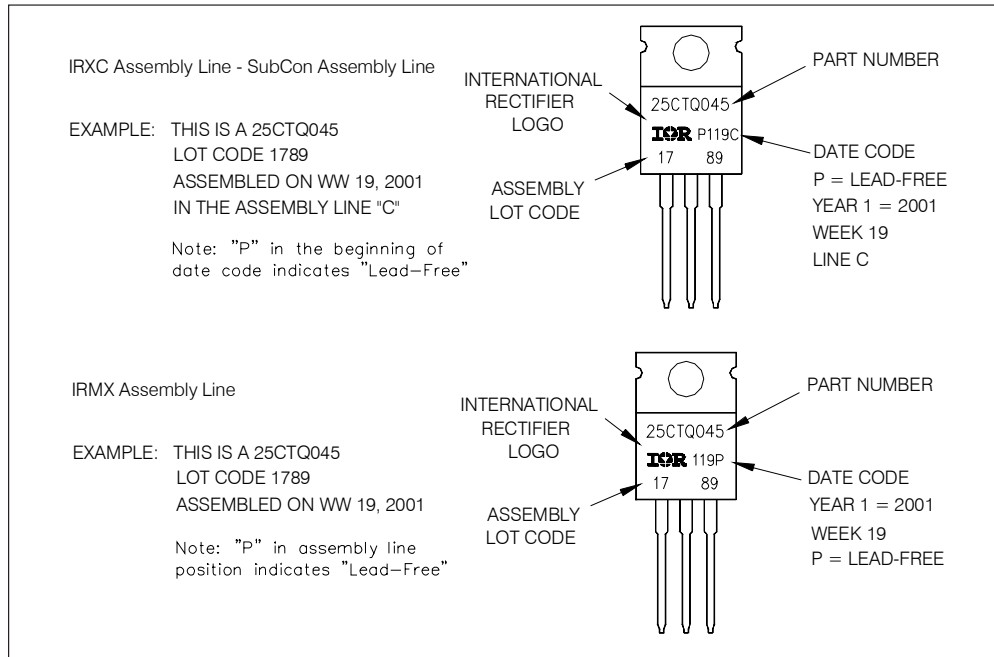


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



Part Marking Information



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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 paralalled 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 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
    
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Ordering Information Table

Device Code	
<b>25</b>	<b>C</b>
①	②
<b>T</b>	<b>Q</b>
③	④
<b>045</b>	<b>PbF</b>
⑤	⑥

<p><b>1</b> - Current Rating (25 = 25A)</p> <p><b>2</b> - Circuit Configuration                  C = Common Cathode</p> <p><b>3</b> - Package                  T = TO-220</p> <p><b>4</b> - Schottky "Q" Series</p> <p><b>5</b> - Voltage Ratings</p> <p><b>6</b> -                  • none = Standard Production                  • PbF = Lead-Free</p>	<table border="1"> <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 and Lead-Free.  
 Qualification Standards can be found on IR's Web site.