

#### Major Ratings and Characteristics

Characteristics	60CTQ150	Units
$I_{F(AV)}$ Rectangular waveform	60	A
$V_{RRM}$	150	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	710	A
$V_F$ @30 Apk, $T_J = 125^\circ\text{C}$ typical (per leg)	0.69	V
$T_J$ range	-55 to 175	$^\circ\text{C}$

#### Description/ Features

The 60CTQ150 center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

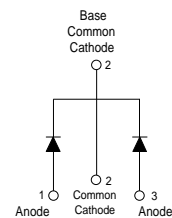
- 175° C  $T_J$  operation
- Center tap TO-220 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

#### Case Styles

60CTQ150



TO-220



## Voltage Ratings

Part number	60CTQ150
$V_R$ Max. DC Reverse Voltage (V)	150
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	60CTQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	30	A	50% duty cycle @ $T_C = 137^\circ\text{C}$ , rectangular wave form
	60		
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	710	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse
	270		10ms Sine or 6ms Rect. pulse
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	0.4	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 0.9\text{Amps}$ , $L = 1\text{mH}$
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	0.9	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	Typ.	Max.	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) (Per Leg) * See Fig. 1	0.83	0.88	V	@ 30A
	0.98	1.09	V	@ 60A
	0.67	0.72	V	@ 30A
	0.82	0.87	V	@ 60A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2	7	75	$\mu\text{A}$	$T_J = 25^\circ\text{C}$
	7.2	20	mA	$T_J = 125^\circ\text{C}$
$C_T$ Typical Junction Capacitance (Per Leg)	-	650	pF	$V_R = 5V_{DC}$ (test signal range 100kHz to 1Mhz) @ $25^\circ\text{C}$
$L_S$ Typical Series Inductance (Per Leg)	-	7.5	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	60CTQ	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 (Per Leg) * See Fig. 4	1.2	$^\circ\text{C/W}$	DC operation
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	0.6	$^\circ\text{C/W}$	DC operation
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.25	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	6 (0.21)	g (oz.)	
T Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)
	Max.	12 (10)	

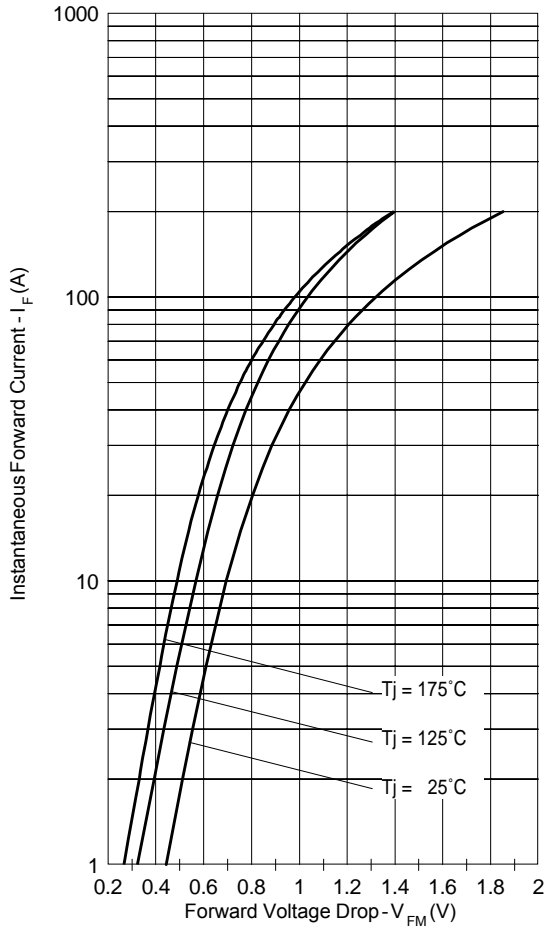


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

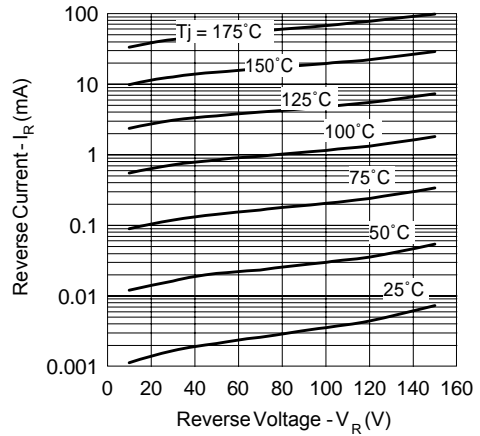


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

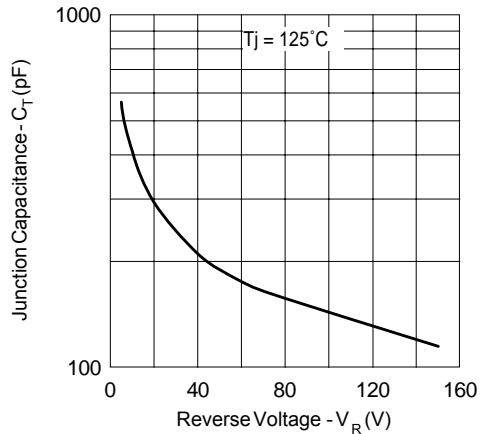


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

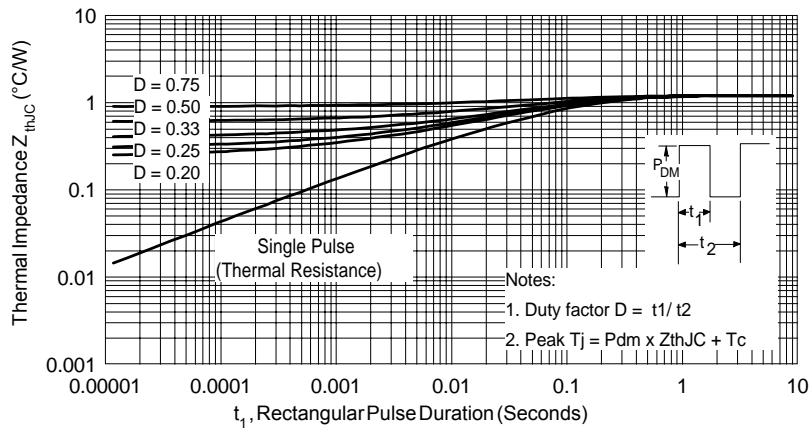


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

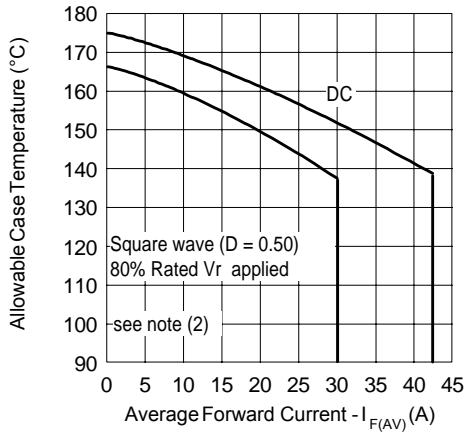


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

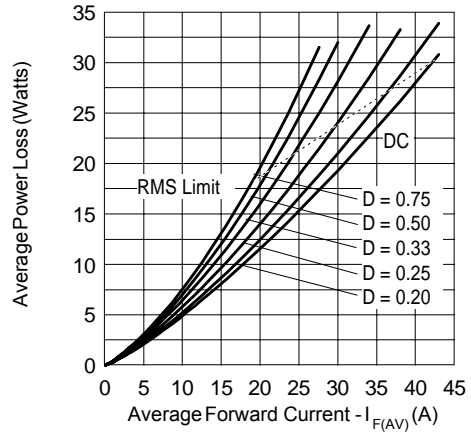


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

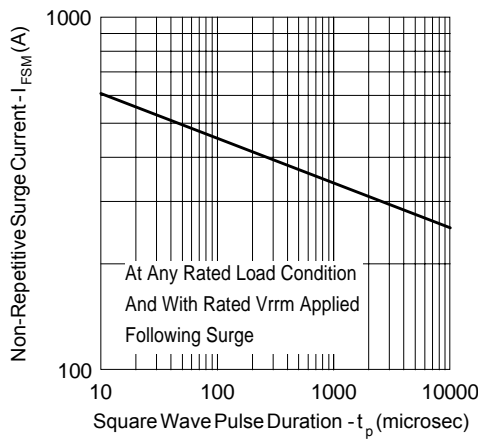


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

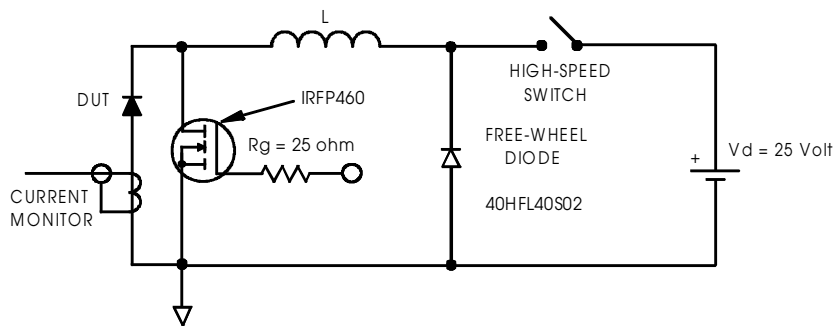
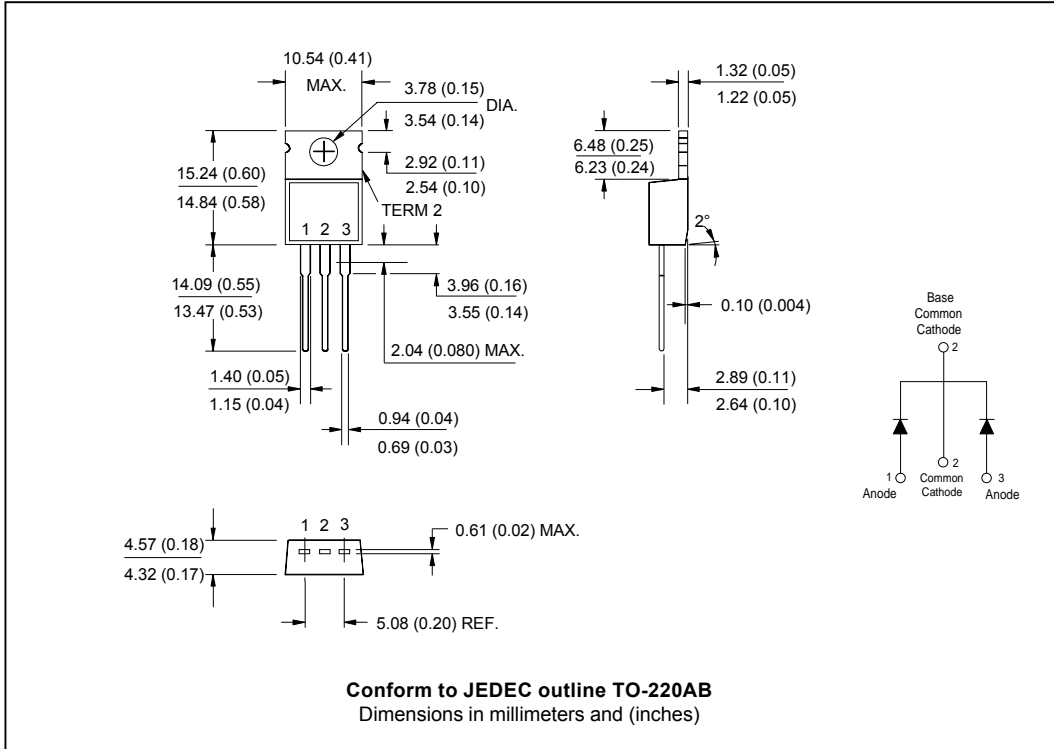


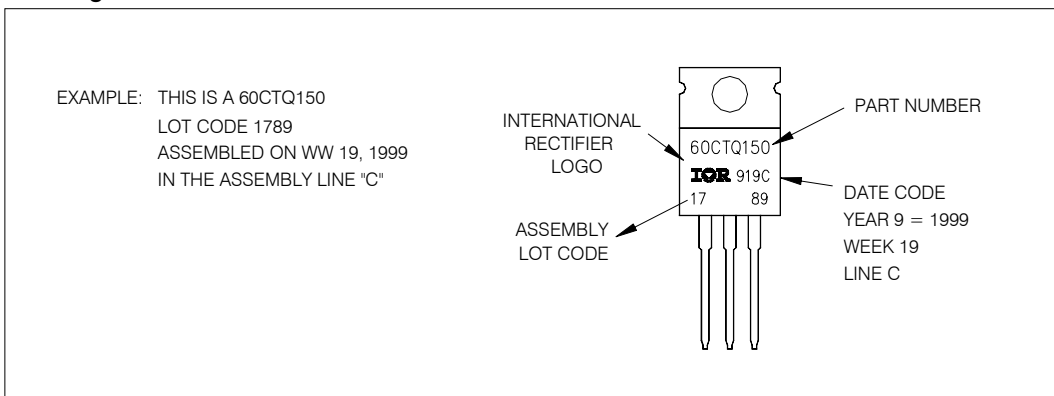
Fig. 8 - Unclamped Inductive Test Circuit

- (2) Formula used:  $T_c = T_j - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);  
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 80\% \text{ rated } V_R$

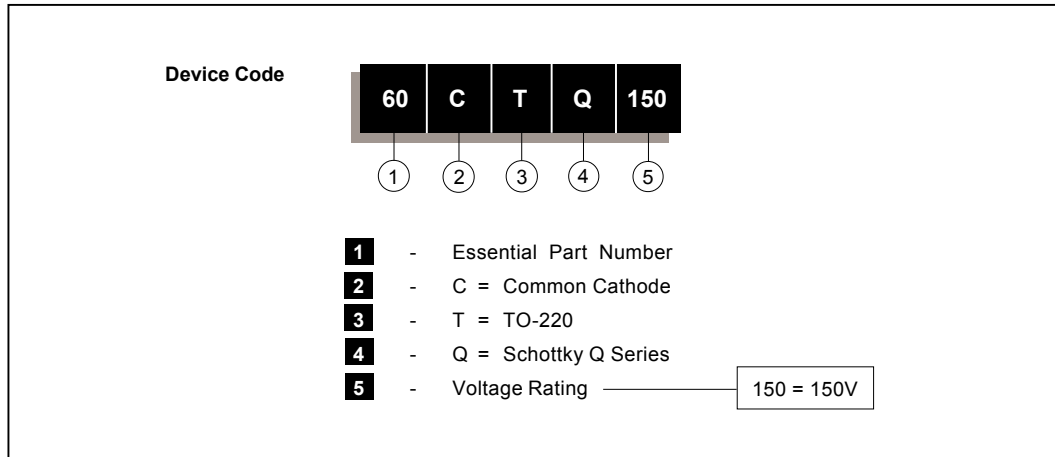
Outline Table



Marking Information



## Ordering Information Table



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

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