

# International IOR Rectifier

## 63CTQ100

SCHOTTKY RECTIFIER

60 Amp

### Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform (Per Device)	60	A
$I_{FRM}$ @ $T_C = 139^\circ\text{C}$ (Per Leg)	60	A
$V_{RRM}$	100	V
$I_{FSM}$ @ $t_p = 5 \mu\text{s}$ sine	1500	A
$V_F$ @ 30 Apk, $T_J = 125^\circ\text{C}$	0.69	V
$T_J$ range	-65 to 175	$^\circ\text{C}$

### Description/Features

This center tap Schottky rectifier 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.

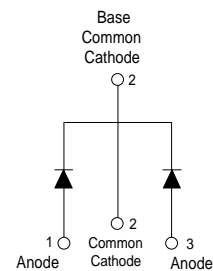
- $175^\circ\text{C}$   $T_J$  operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

### Case Styles

63CTQ100



TO-220



## Voltage Ratings

Parameters	63CTQ100
$V_R$ Max. DC Reverse Voltage (V)	100
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) (Per Device)	30	A	50% duty cycle @ $T_C = 139^\circ\text{C}$ , rectangular wave form
	60		
$I_{FRM}$ Peak Repetitive Forward Current (Per Leg)	60	A	Rated $V_R$ , square wave, 20kHz $T_C = 140^\circ\text{C}$
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg)	1500	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated $V_{RRM}$ applied
	300		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	11.25	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 0.75\text{Amps}$ , $L = 40\text{mH}$
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	0.75	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)	0.78	0.82	V	@ 30A $T_J = 25^\circ\text{C}$
	0.94	1.0	V	@ 60A
	0.64	0.69	V	@ 30A $T_J = 125^\circ\text{C}$
	0.78	0.83	V	@ 60A
$I_{RM}$ Max. Instantaneous Reverse Current	0.02	0.3	mA	$T_J = 25^\circ\text{C}$ Rated DC voltage
	11	20	mA	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance	1100		pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance	8.0		nH	Measured from top of terminal to mounting plane
$dv/dt$ 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	Values	Units	Conditions
$T_J$ Max. Junction Temperature Range	-65 to 175	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-65 to 175	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Leg)	1.2	$^\circ\text{C/W}$	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 (0.07)	g (oz.)	
T Mounting Torque	Min.	6 (5)	Kg-cm (lb-in)
	Max.	12 (10)	

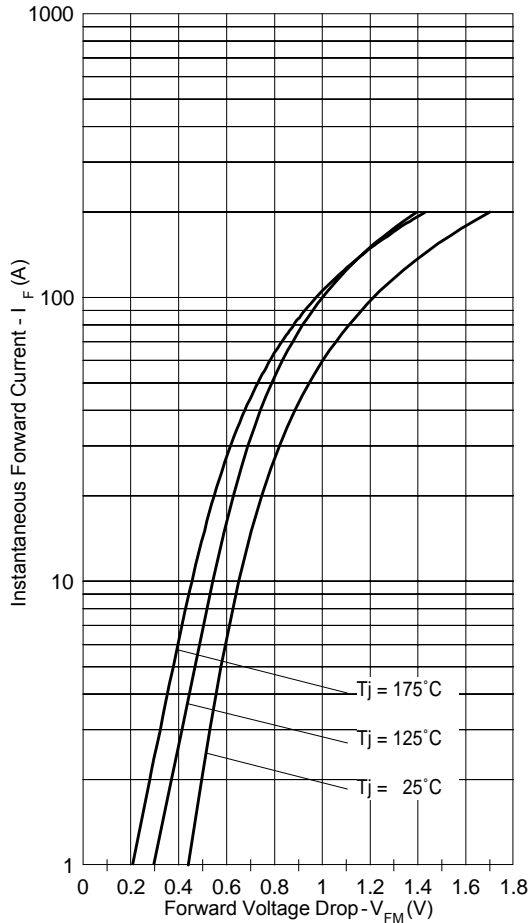


Fig. 1 - Maximum Forward Voltage Drop Characteristics

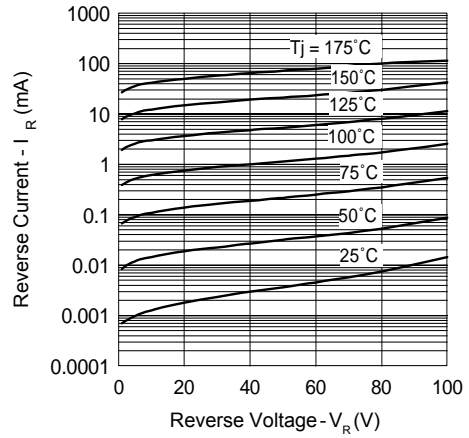


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

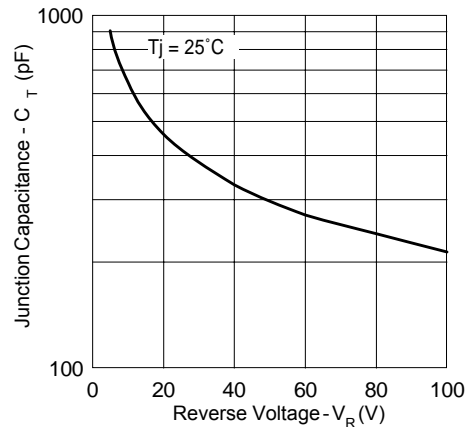


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

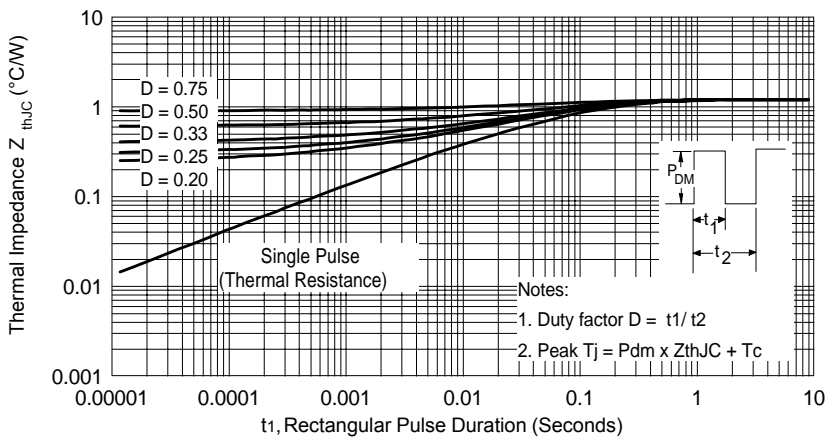
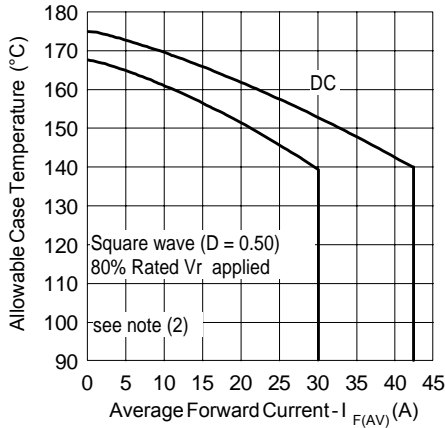
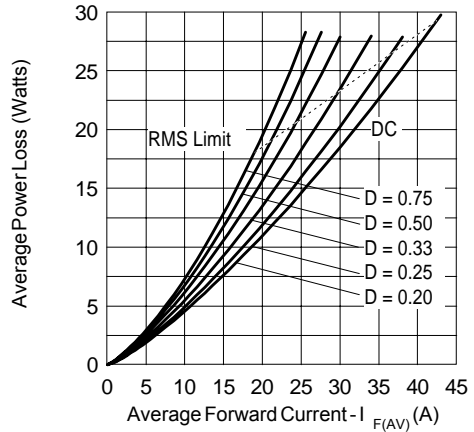


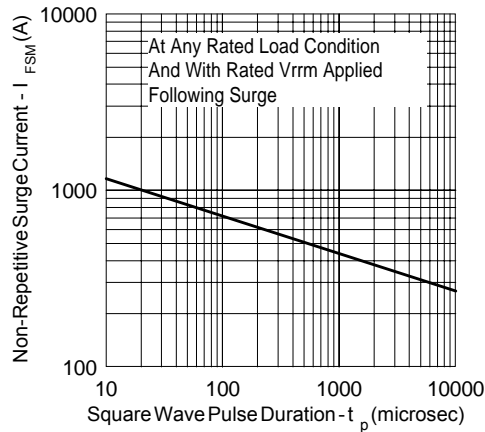
Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics



**Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current**



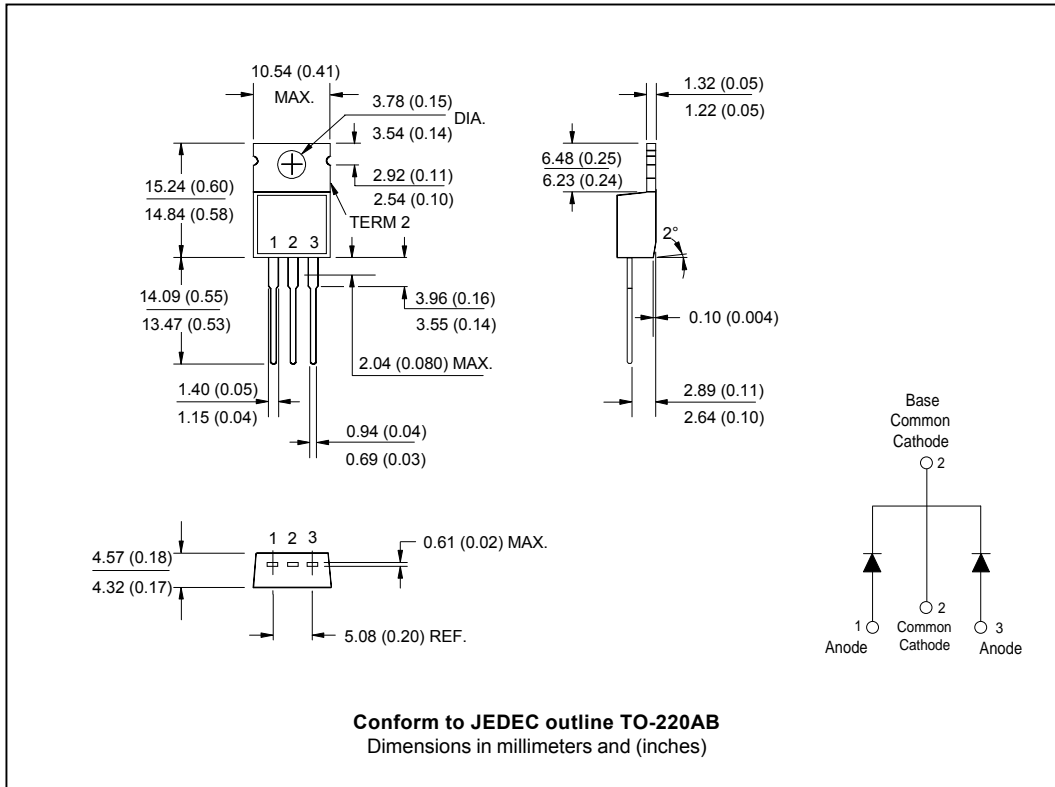
**Fig. 6 - Forward Power Loss Characteristics**



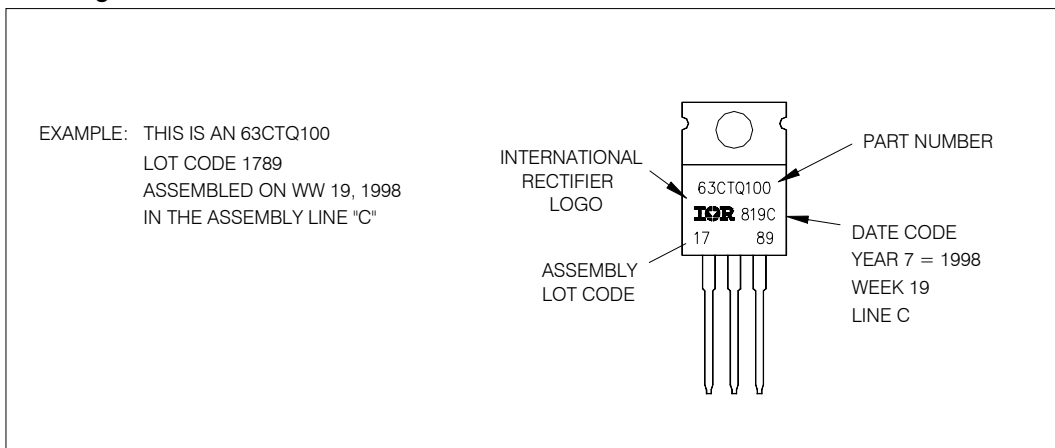
**Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)**

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

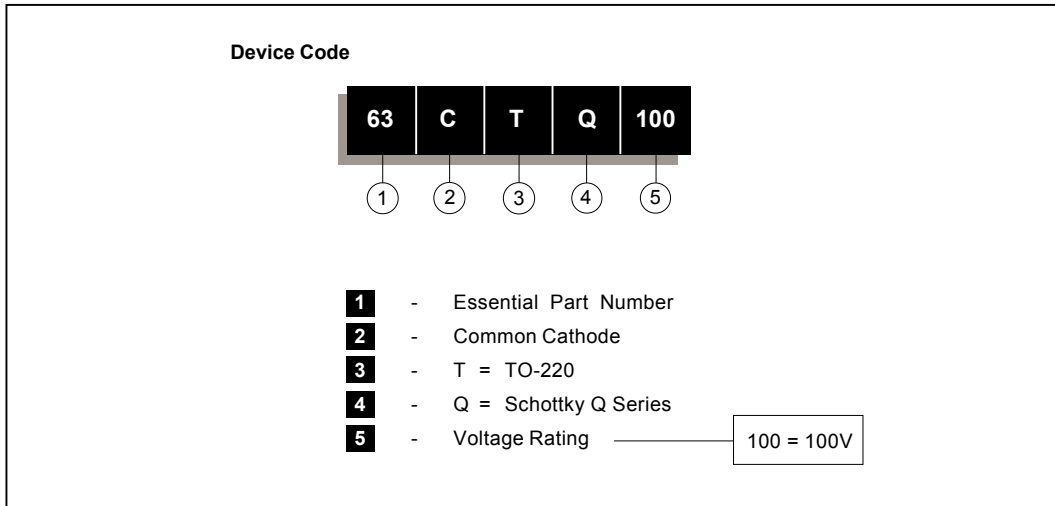
Outline Table



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

**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](http://www.irf.com) for sales contact information. 12/01