

International
IRF Rectifier

61CTQ045

SCHOTTKY RECTIFIER

60 Amp

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform (Per Device)	60	A
I_{FRM} @ $T_C = 142^\circ\text{C}$ (Per Leg)	60	A
V_{RRM}	45	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ sine	2600	A
V_F @ $30 \text{ A pk}, T_J = 125^\circ\text{C}$	0.57	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°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

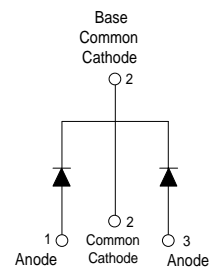
- 175°C T_J operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

61CTQ045



TO-220



Voltage Ratings

Parameters	61CTQ045
V_R Max. DC Reverse Voltage (V)	45
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	@ $T_C = 142^\circ\text{C}$, (Rated V_R)
	60		
I_{FRM} Peak Repetitive Forward Current (Per Leg)	60	A	Rated V_R , square wave, 20kHz $T_C = 142^\circ\text{C}$
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg)	2600	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
	350		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	27	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 4\text{Amps}$, $L = 3.4\text{mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	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	Typ.	Max.	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1)	0.57	0.61	V	@ 30A $T_J = 25^\circ\text{C}$
	0.72	0.76	V	@ 60A
	0.53	0.57	V	@ 30A $T_J = 125^\circ\text{C}$
	0.70	0.74	V	@ 60A
I_{RM} Max. Instantaneous Reverse Current	0.06	1	mA	$T_J = 25^\circ\text{C}$ Rated DC voltage
	21	40	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance	1900		pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) 25°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/ μs	

(1) Pulse Width < 300 μs , 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 (lbf-in)
	Max.	12 (10)	

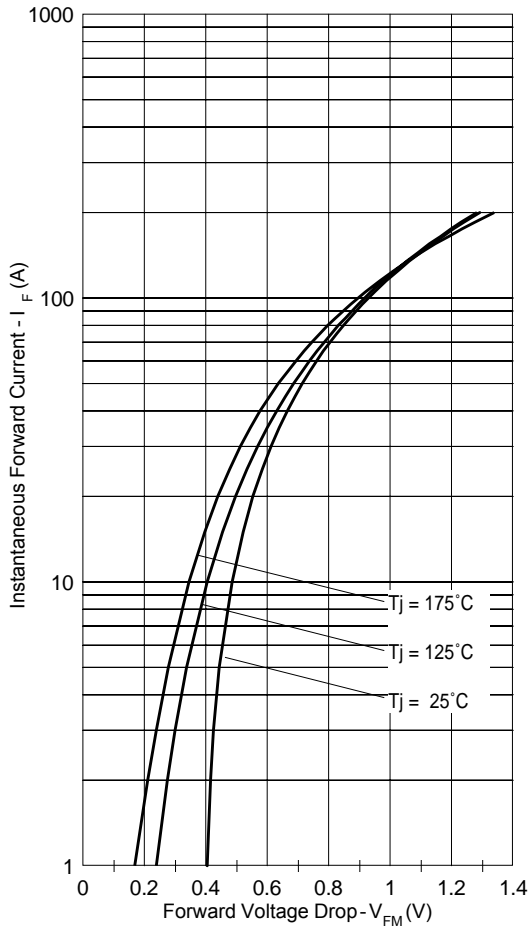


Fig. 1 - Maximum Forward Voltage Drop Characteristics

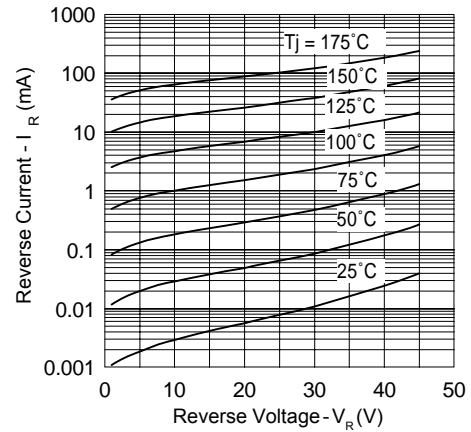


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

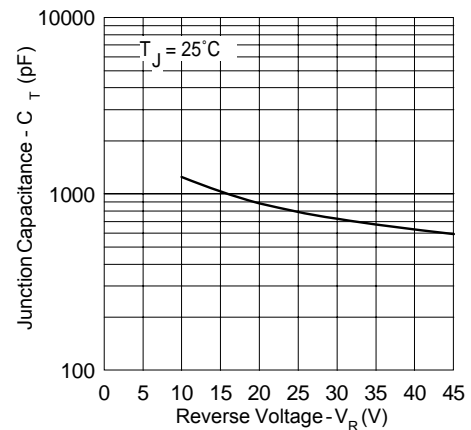


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

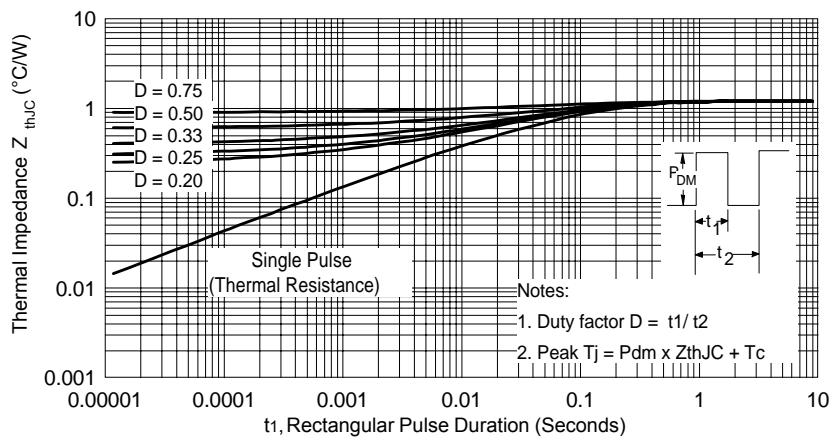


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

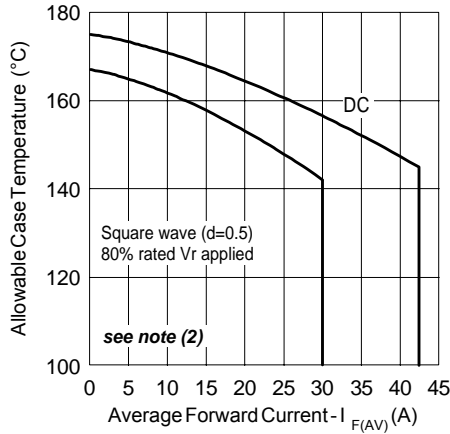


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

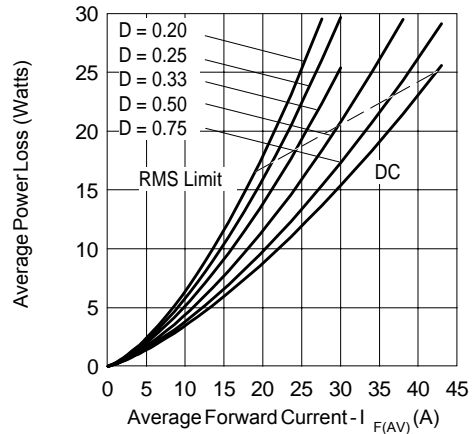


Fig. 6 - Forward Power Loss Characteristics

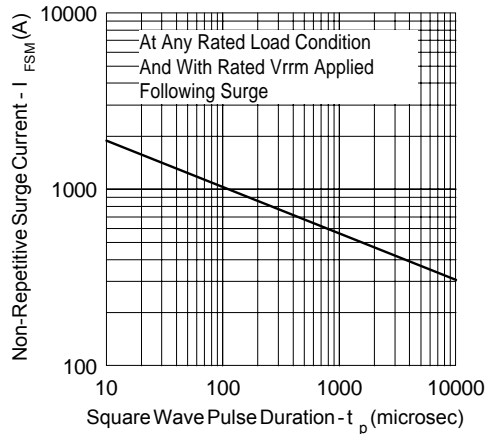
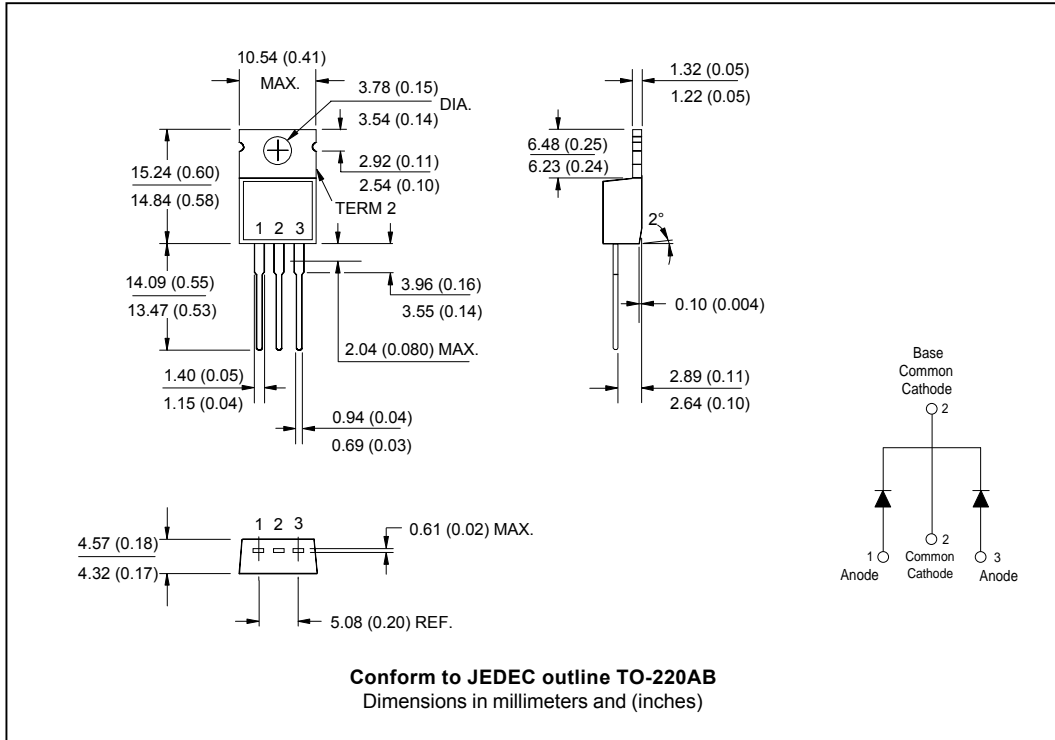


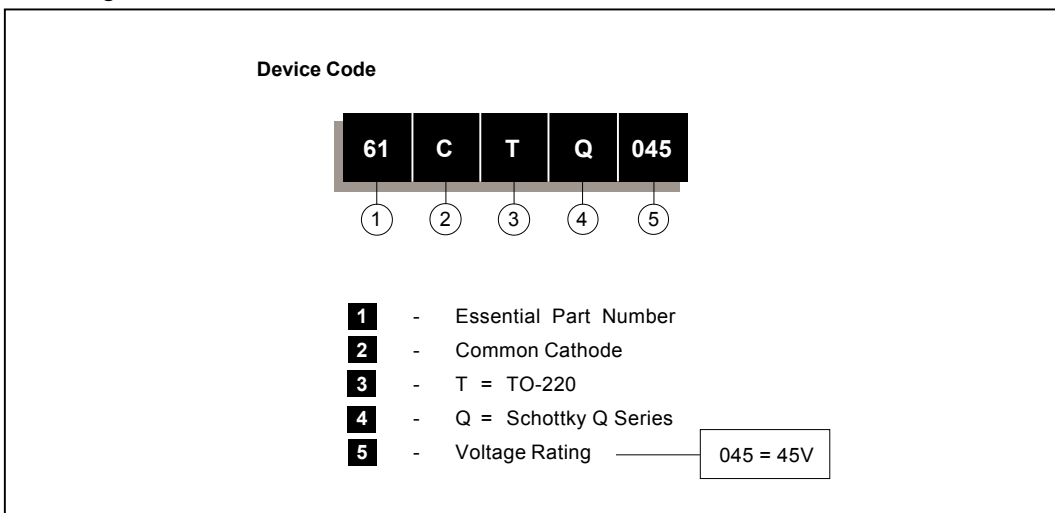
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

Outline Table



Ordering Information Table



61CTQ045

Bulletin PD-20638 rev. A 12/01

International
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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.

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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. 12/01