

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

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	30	A
V_{RRM}	30	V
I_{FSM} @tp = 5 μ s sine	900	A
V_F @15 Apk, $T_J = 125^\circ\text{C}$	0.40	V
T_J range	-55 to 150	$^\circ\text{C}$

Description/ Features

The 32CTQ030PbF Schottky rectifier series has been optimized for low reverse leakage at high temperature. 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.

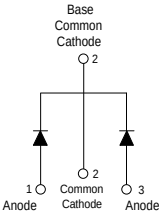
- 150° C T_J operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles

32CTQ030PbF



TO-220



32CTQ030PbF

Bulletin PD-20848 10/04

International
IOR Rectifier

Voltage Ratings

Part number	32CTQ030PbF
V_R Max. DC Reverse Voltage (V)	30
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	32CTQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	30	A	50% duty cycle @ $T_C = 115^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	900	A	5 μs Sine or 3 μs Rect. pulse
	250		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	13	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1.20\text{ Amps}$, $L = 11.10\text{ mH}$
I_{AR} Repetitive Avalanche Current	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	32CTQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1	0.49	V	@ 15A
	0.58	V	@ 30A
	0.40	V	@ 15A
	0.53	V	@ 30A
I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2	1.75	mA	$T_J = 25^\circ\text{C}$
	97	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.233	V	$T_J = T_J \text{ max.}$
r_f Forward Slope Resistance	9.09	m Ω	
C_T Max. Junction Capacitance Per Leg	1300	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	32CTQ	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_{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
	Max.	12 (10)	(lbf-in)
Marking Device	32CTQ030		

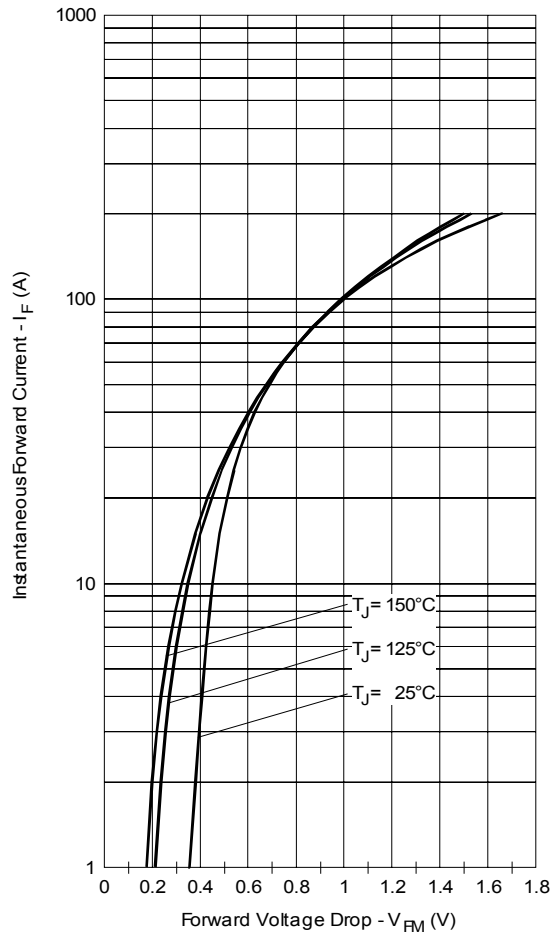


Fig. 1 - Maximum Forward Voltage Drop Characteristics

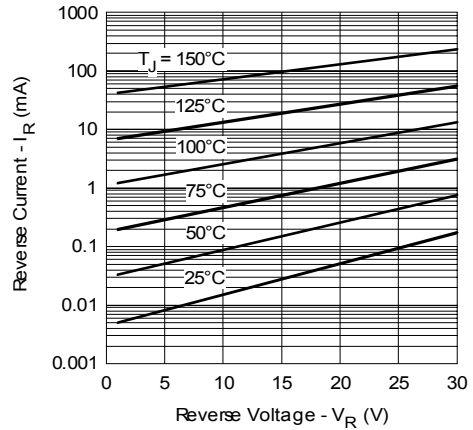


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

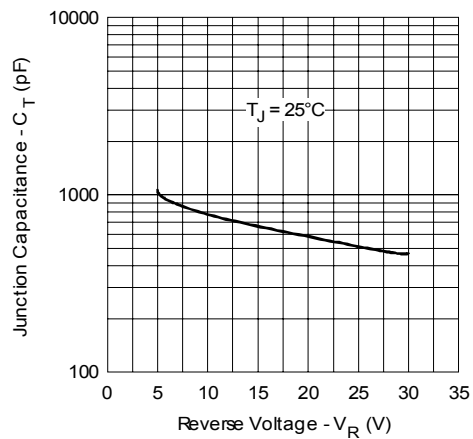


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

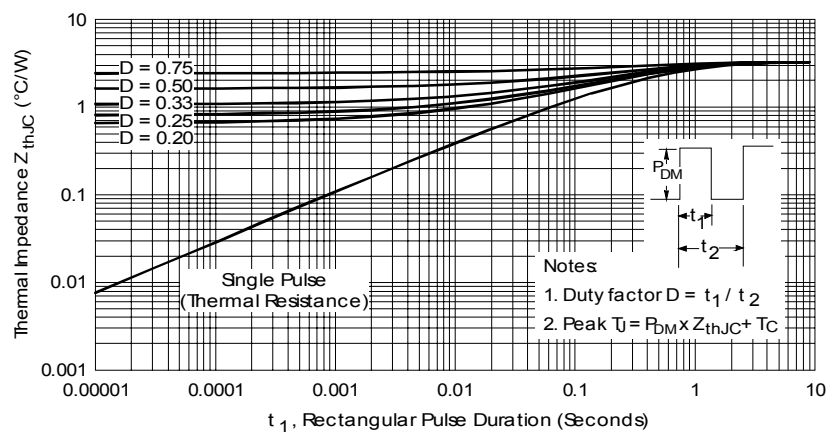


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

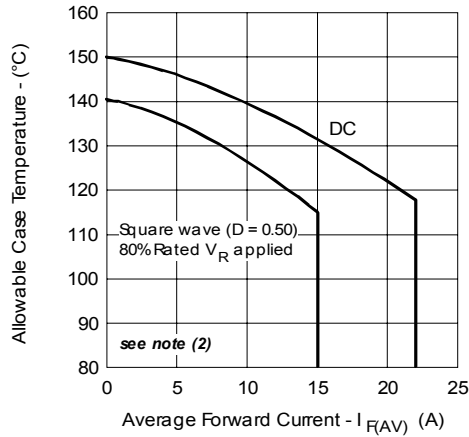


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

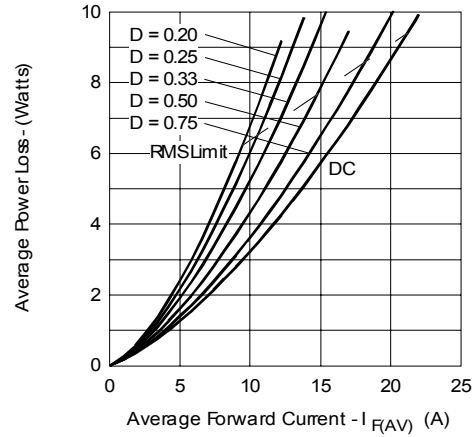


Fig. 6 - Forward Power Loss Characteristics

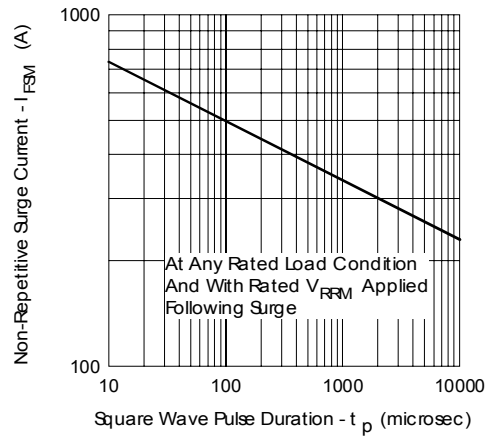


Fig. 7 - Maximum Non-Repetitive Surge Current

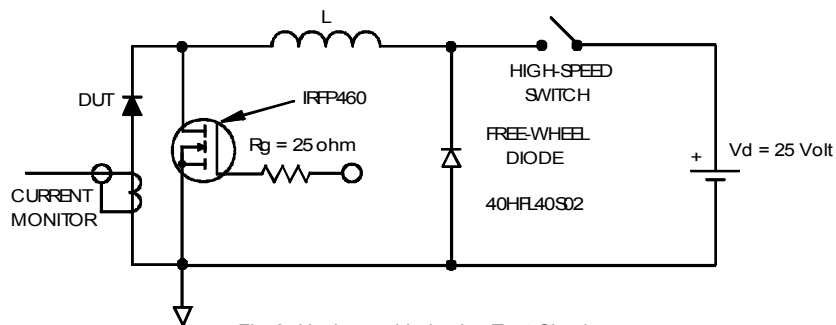


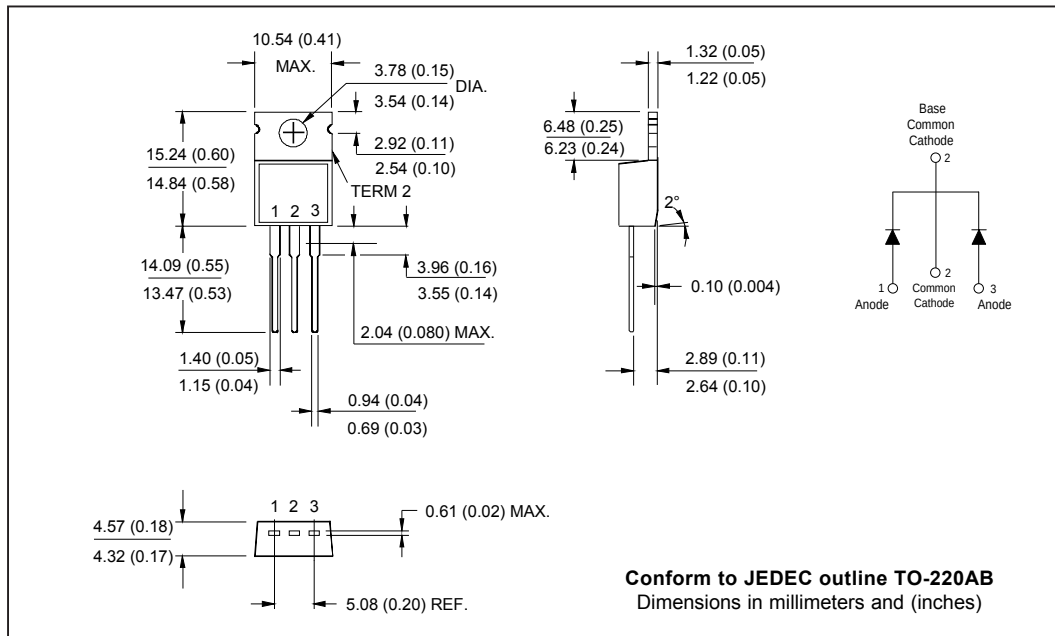
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_c = T_j - (P_d + P_{d_{REV}}) \times R_{thJC}$

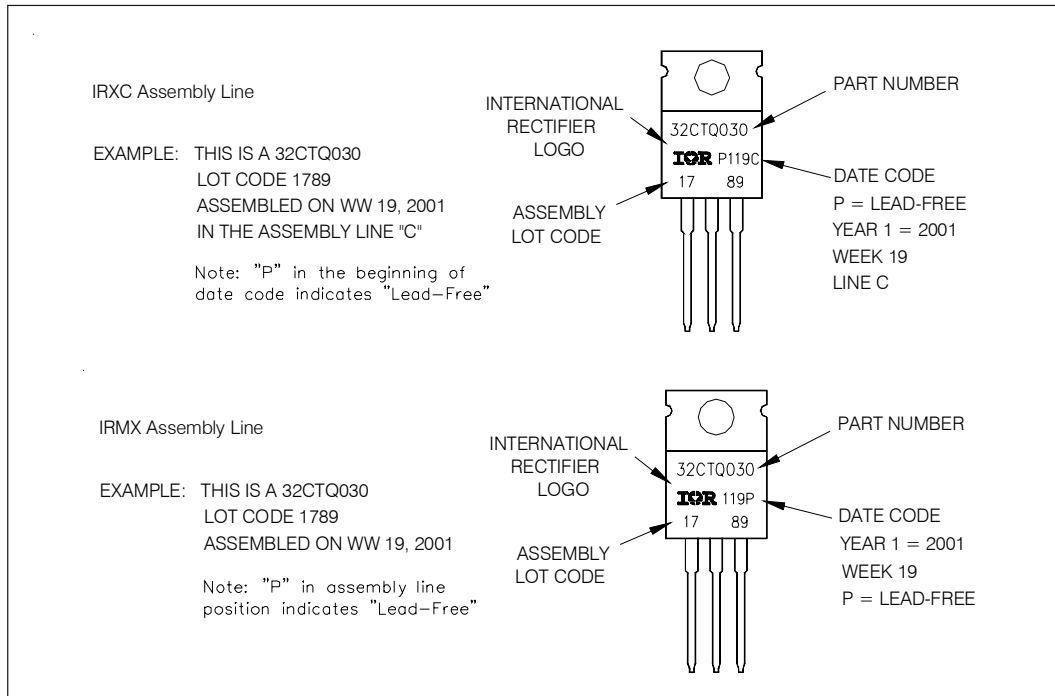
P_d = Forward Power Loss = $I_{FAV} \times V_{FM} @ (I_{FAV}/D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_R (1-D)$; $I_R @ V_{R1} = 80\% \text{ rated } V_R$

Outline Table



Part Marking Information



Ordering Information Table

Device Code

32	C	T	Q	030	PbF
1	2	3	4	5	6

1	-	Current Rating (30A)
2	-	Circuit Configuration
		C = Common Cathode
3	-	Package
		T = TO-220
4	-	Schottky "Q" Series
5	-	Voltage Rating (030 = 30V)
6	-	• none = Standard Production • PbF = Lead-Free

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.

International
IR Rectifier

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