

Bulletin PD-21034 rev. A 07/06

International
IR Rectifier

32CTQ030SPbF
32CTQ030-1PbF

SCHOTTKY RECTIFIER

32 Amp

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

Major Ratings and Characteristics

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

Description/ Features

The 32CTQ030.. 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

32CTQ030SPbF



Base
Common
Cathode
O 2

1 O Anode

3 O Anode

D²PAK

32CTQ030-1PbF



Base
Common
Cathode
O 2

1 O Anode

3 O Anode

TO-262



32CTQ030SPbF, 32CTQ030-1PbF

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International
IRF Rectifier

Voltage Ratings

Part number	32CTQ030SPbF, 32CTQ030-1PbF
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 °C, rectangular wave form
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	900	A	5µs Sine or 3µs Rect. pulse
	250		10ms Sine or 6ms Rect. pulse
E _{AS} Non-Repetitive Avalanche Energy	13	mJ	T _J = 25 °C, I _{AS} = 1.20 Amps, L = 11.10 mH
I _{AR} Repetitive Avalanche Current	3	A	Current decaying linearly to zero in 1µsec Frequency limited by T _J max. V _A = 1.5 x 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 °C
	97	mA	T _J = 125 °C
V _{F(TO)} Threshold Voltage	0.233	V	T _J = T _J max.
r _t Forward Slope Resistance	9.09	mΩ	
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	10000	V/µs	(Rated V _R)

(1) Pulse Width < 300µs, Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters			32CTQ	Units	Conditions	
T _J	Max. Junction Temperature Range		-55 to 150	°C		
T _{stg}	Max. Storage Temperature Range		-55 to 150	°C		
R _{thJC}	Max. Thermal Resistance Junction to Case Per Leg		3.25	°C/W	DC operation * See Fig. 4	
R _{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°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)			
Marking Device			32CTQ030S	Case style D ² Pak		
			32CTQ030-1	Case style TO-262		

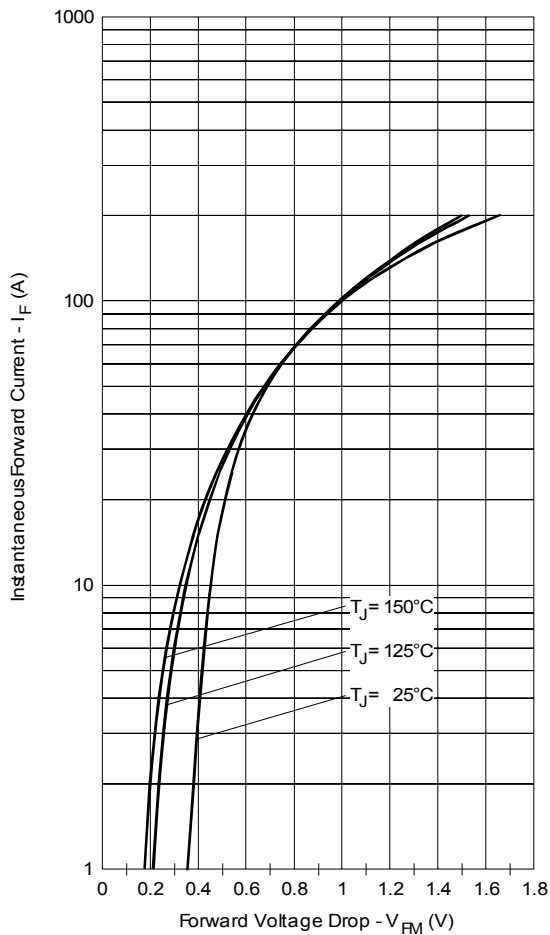


Fig. 1 - Maximum Forward Voltage Drop Characteristics

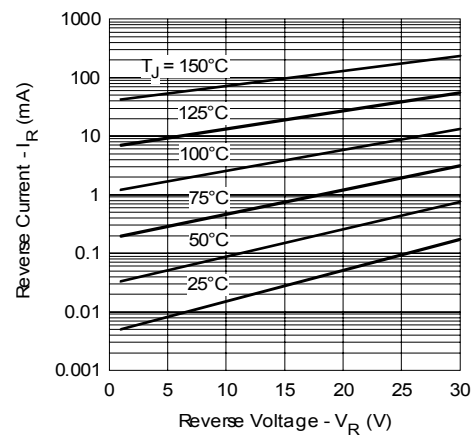


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

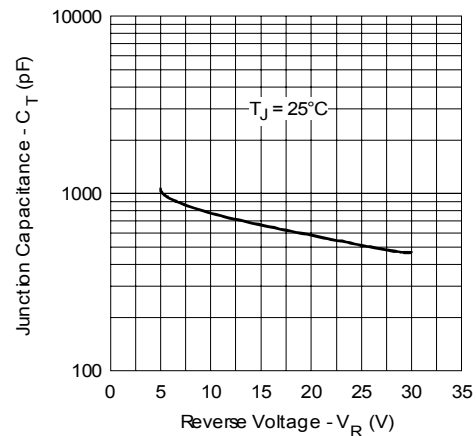


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

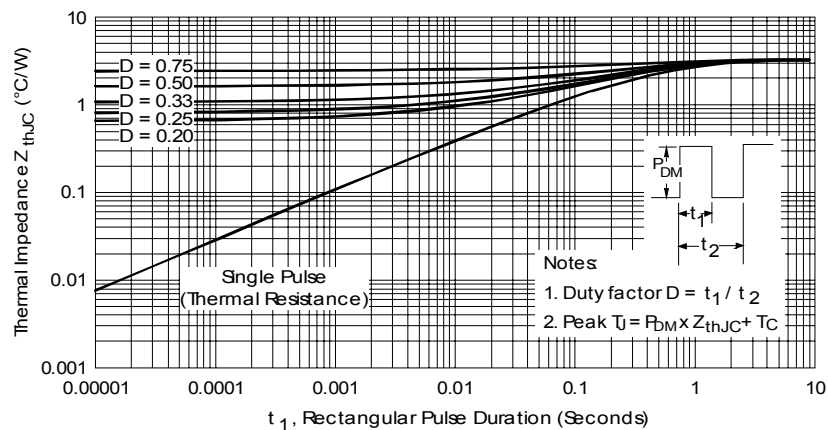


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

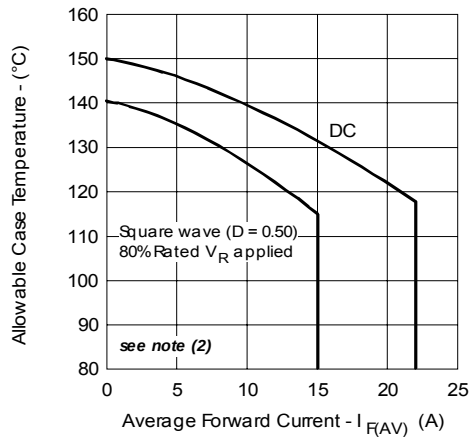


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

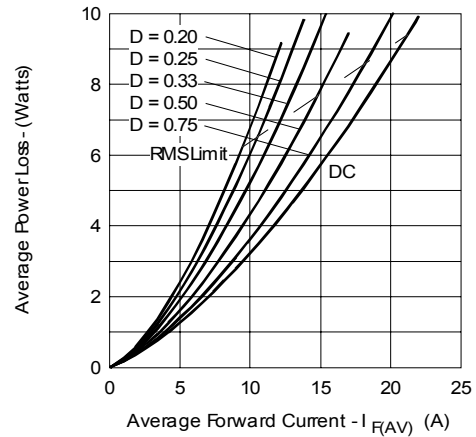


Fig. 6 - Forward Power Loss Characteristics

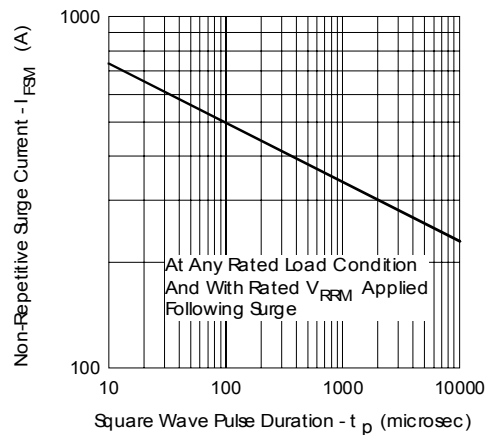


Fig. 7 - Maximum Non-Repetitive Surge Current

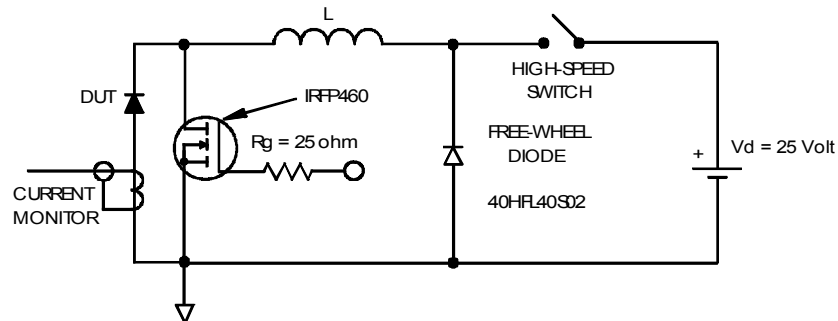


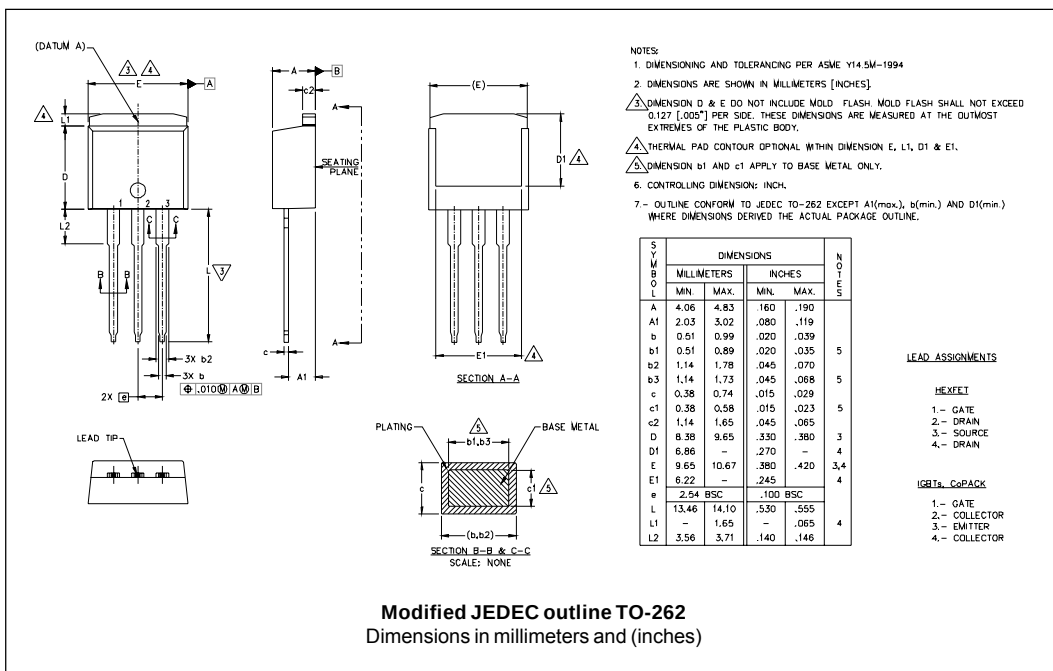
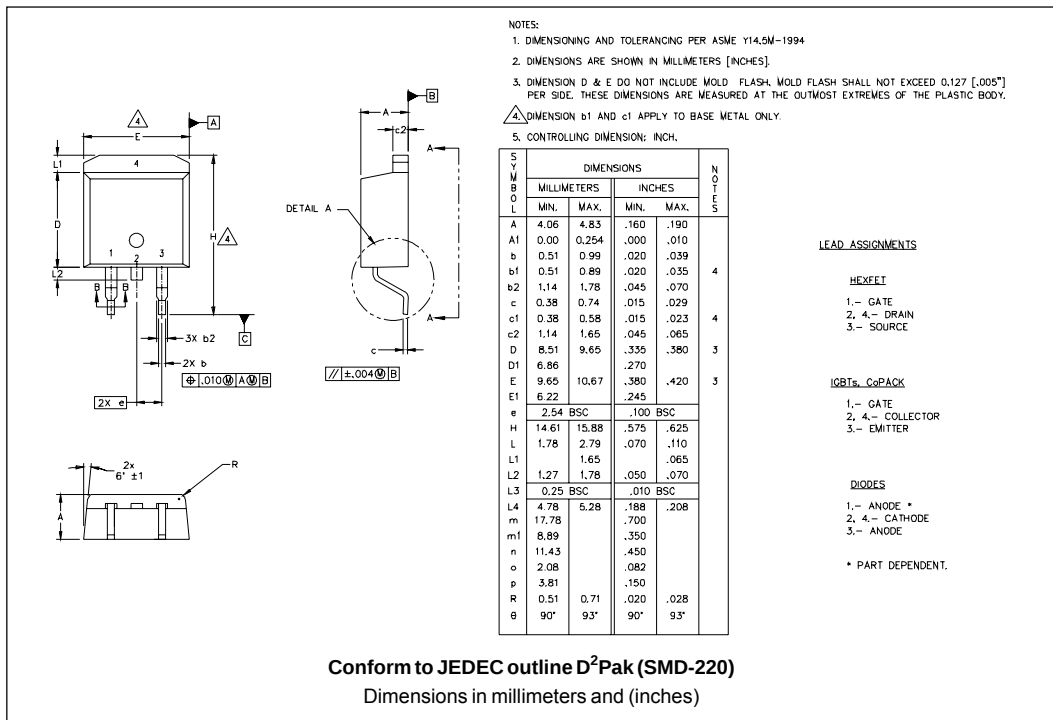
Fig. 8 - Unclamped Inductive Test Circuit

(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 = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

Outlines Table



D²PAK

EXAMPLE: THIS IS A 32CTQ030S
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

Note: "P" in assembly line position indicates "Lead-Free"

The diagram shows a D²PAK package with the following markings and callouts:

- INTERNATIONAL RECTIFIER LOGO**: Points to the "IR" logo on the package.
- PART NUMBER**: Points to "32CTQ030S" on the package.
- DATE CODE**: Points to "002P" on the package.
- ASSEMBLY LOT CODE**: Points to "80 24" on the package.

Legend:
YEAR 0 = 2000
WEEK 02
P = LEAD-FREE

0.35±0.05

0.12 max

F

B2

1.20

Ko

SECTION Y-Y

P2

2.0±0.1

SEE NOTE 5

P0

4.0±0.1

SEE NOTE 1

1.75±0.1

F

SEE NOTE 5

W

P1

A0

2.17±0.1

1.57±0.1

Y

Y

0.155±0.05

ø1.6 ±0.1

R 0.3 Typical

NOTES:

- 1.0 SPROCKET HOLE PITH CUMULATIVE TOLERANCE ±0.02
- 2.0 CAMBER NOT TO EXCEED 1mm in 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENEC ALLOY
- 4.0 K0 MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
- 5.0 MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF POCKET
- 6.0 VENDOR: (OPTIONAL)
- 7.0 MUST ALSO MEET REQUIREMENTS OF EIA STANDAR #EIA-481A TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT
- 8.0 SURFACE RESISTIVITY OF MOLDED MATL. MUST MEASURE LESS OR EQUAL TO 10⁶ OHMS PER SQUARE, MEASURED IN ACCORDANCE PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991
- 9.0 TOTAL LENGTH PER REEL MUST BE 45 METERS
- 10.0 © CRITICAL

Ao	10.50	+/- 0.1
Bo	15.80	+/- 0.1
B2	10.25	+/- 0.1
Ko	4.90	+/- 0.1
F	11.50	+/- 0.1
P1	16.00	+/- 0.1
W	24.00	+/- 0.3

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code							
	32	C	T	Q	030	S	TRL PbF
	1	2	3	4	5	6	7 8
1	- Current Rating (30A)						
2	- Circuit Configuration						
	C = Common Cathode						
3	- T = TO-220						
4	- Schottky "Q" Series						
5	- Voltage Rating (030 = 30V)						
6	- • S = D ² Pak						
	• -1= TO-262						
7	- • none = Tube (50 pieces)						
	• TRL = Tape & Reel (Left Oriented - for D ² Pak only)						
	• TRR = Tape & Reel (Right Oriented - for D ² Pak only)						
8	- • none = Standard Production						
	• PbF = Lead-Free						

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.