Bulletin PD-20265 07/00

International
IOR Rectifier

32CTQ030
32CTQ030S
32CTQ030-1

SCHOTTKY RECTIFIER

32 Amp

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

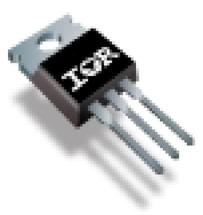
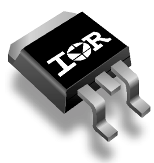
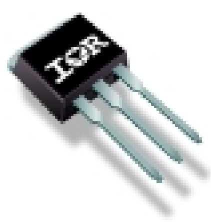
Major Ratings and Characteristics

Characteristics	32CTQ	Units
$I_{F(AV)}$ Rectangular waveform	30	A
V_{RRM}	30	V
I_{FSM} @ tp = 5 μs sine	900	A
V_F @ 15 Apk, T_J = 125°C	0.40	V
T_J range	- 55 to 150	°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

Case Styles		
32CTQ030	32CTQ030S	32CTQ030-1
		
TO-220	D^2PAK	TO-262

Voltage Ratings

	Part number	32CTQ030
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	900	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	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 1 µsec 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)	0.49	V	@ 15A	T_J = 25 °C
	* See Fig. 1	0.58	V	@ 30A	
		0.40	V	@ 15A	T_J = 125 °C
		0.53	V	@ 30A	
I_{RM}	Max. Reverse Leakage Current (1)	1.75	mA	T_J = 25 °C	V_R = rated V_R
	* See Fig. 2	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 (Rated V_R)	10,000	V/ µs		

(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)		

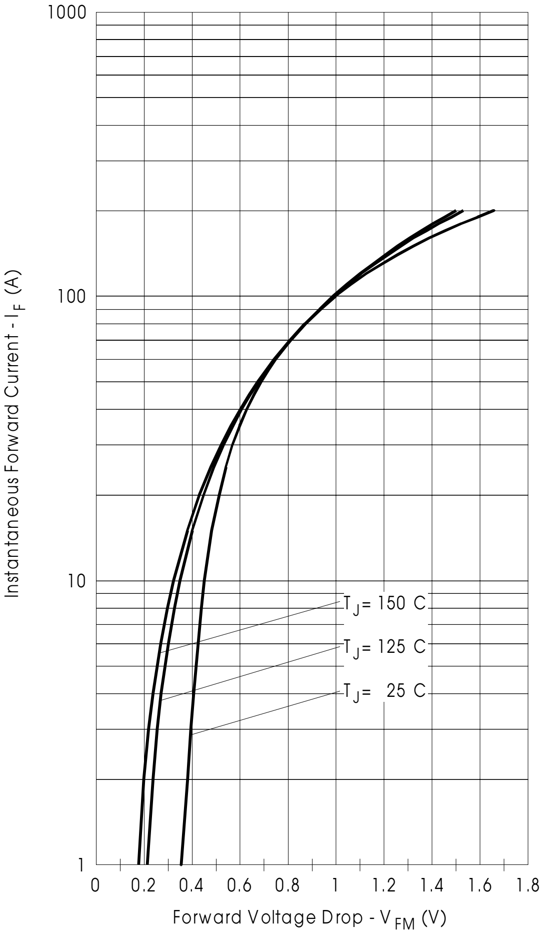


Fig. 1 - Maximum Forward Voltage Drop Characteristics

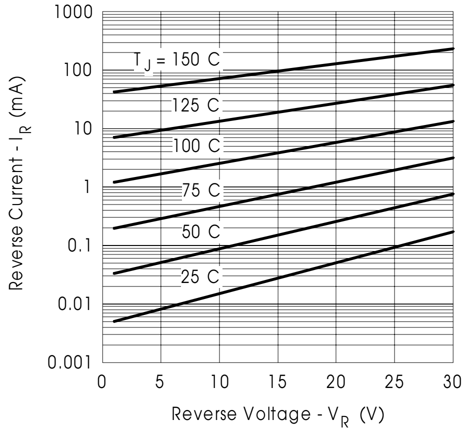


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

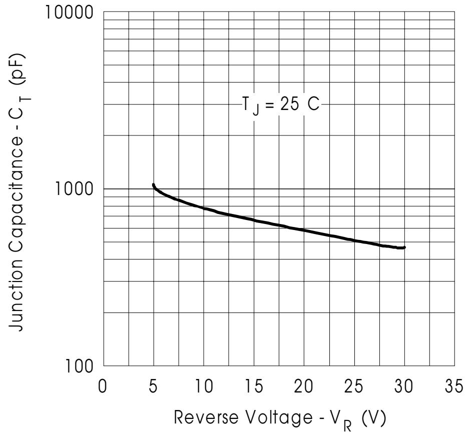


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

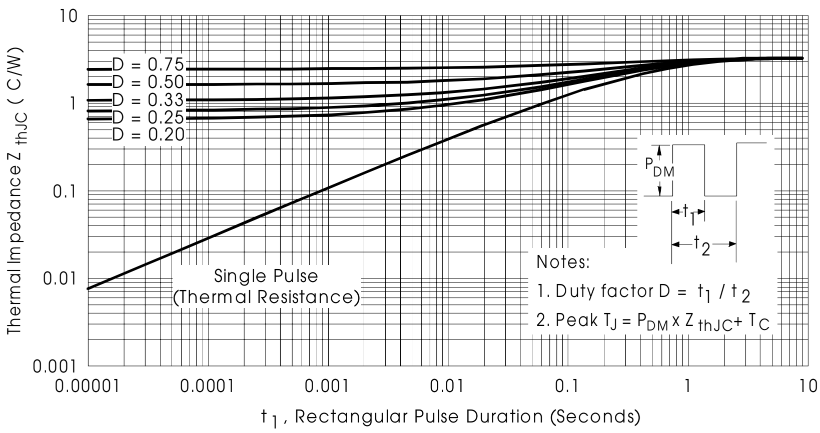


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

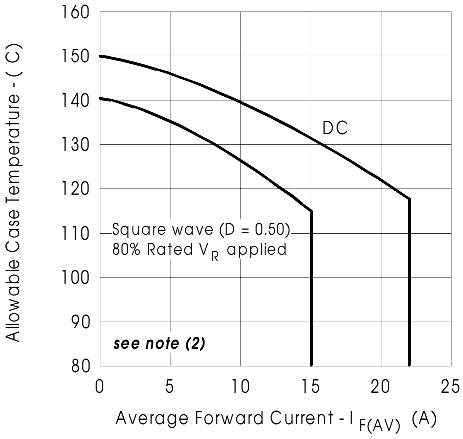


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

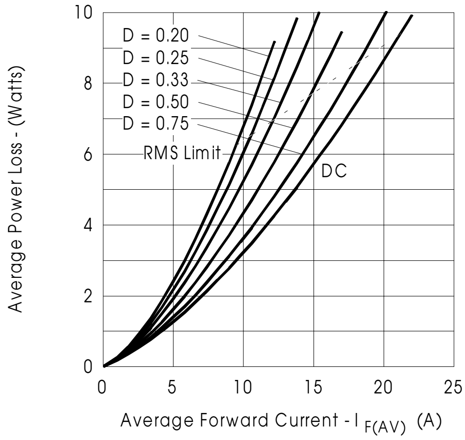


Fig. 6 - Forward Power Loss Characteristics

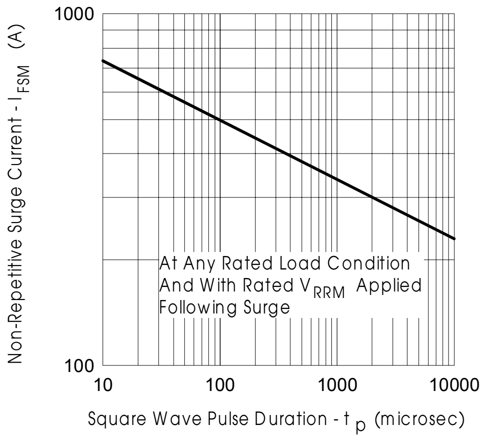


Fig. 7 - Maximum Non-Repetitive Surge Current

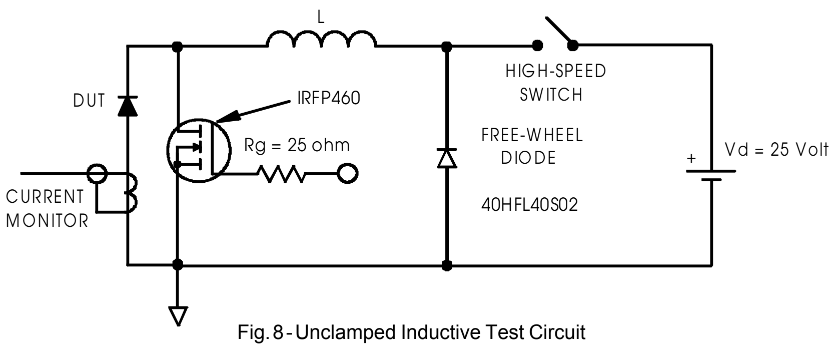


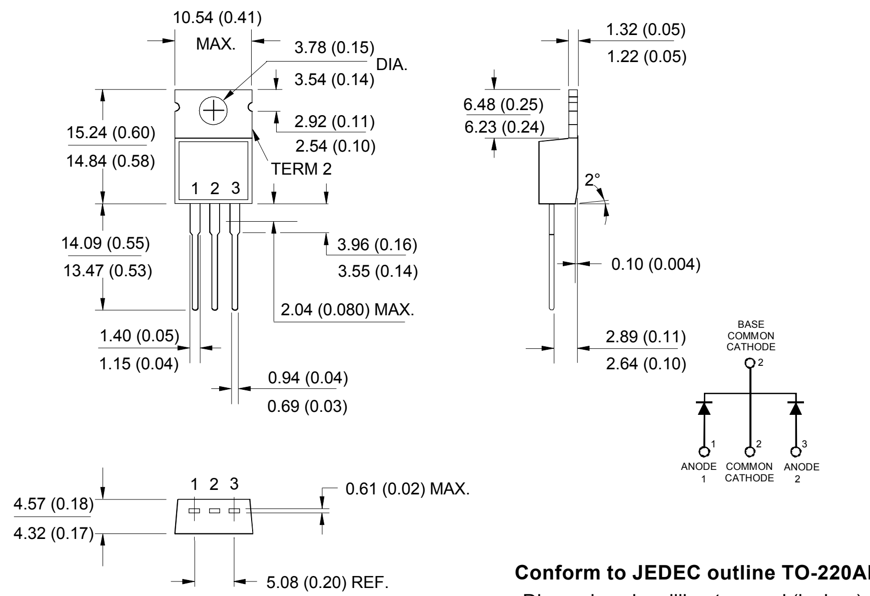
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;

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

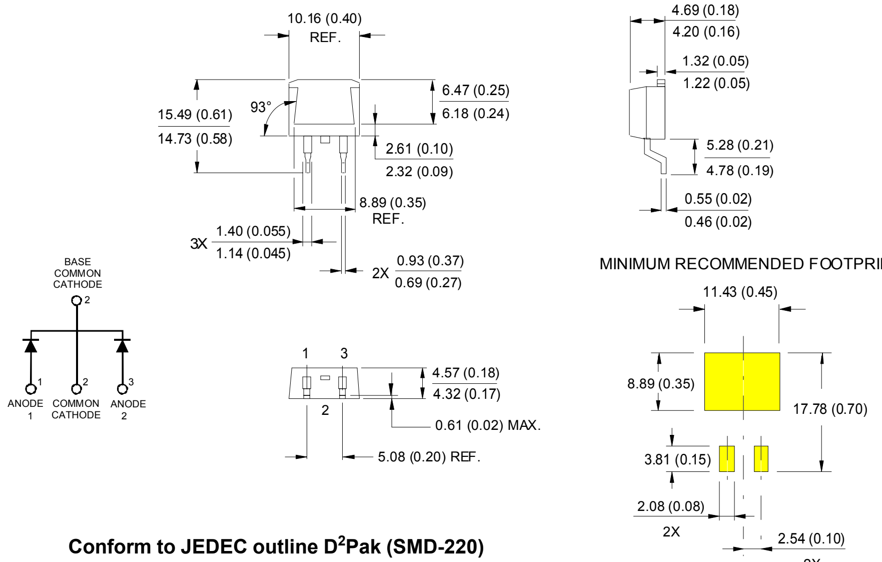
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; I_R @ V_{R1} = 80% rated V_R

Outline Table



Conform to JEDEC outline TO-220AB

Dimensions in millimeters and (inches)

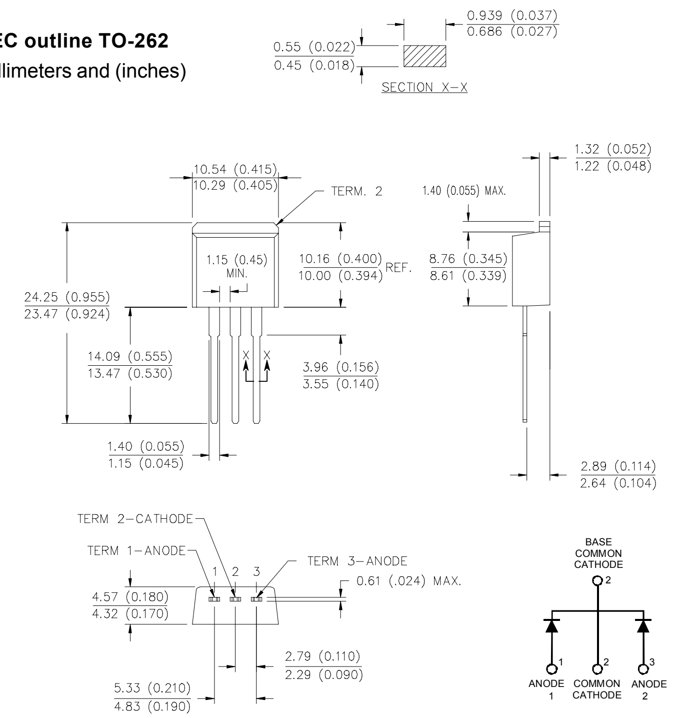


Conform to JEDEC outline D^{2}Pak (SMD-220)

Dimensions in millimeters and (inches)

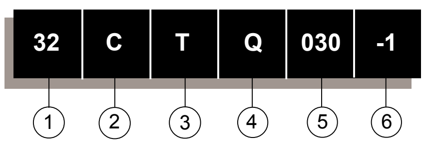
Outline Table

Modified JEDEC outline TO-262
Dimensions in millimeters and (inches)



Ordering Information Table

Device Code



1	-	Essential Part Number
2	-	Common Cathode
3	-	T = TO-220
4	-	Q = Schottky Q Series
5	-	Voltage Rating 030 = 30V
6	-	S = D^{2}Pak
	-	-1 = TO-262