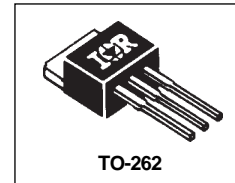


42CTQ030L

SCHOTTKY RECTIFIER

40 Amp



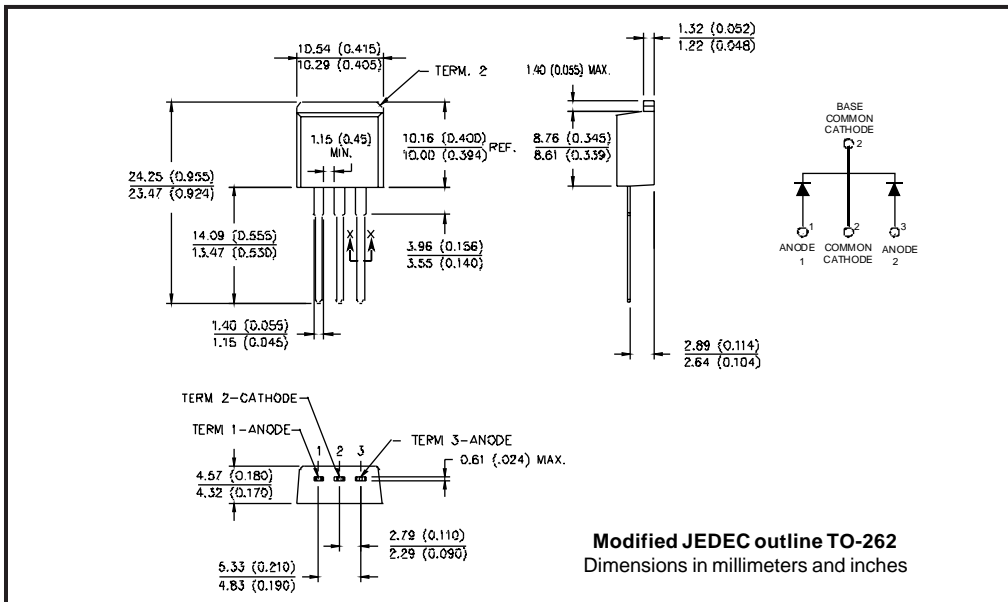
Major Ratings and Characteristics

Characteristics	42CTQ...L	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	30	V
I_{FSM} @ tp = 5 μ s sine	1100	A
V_F @ 20 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.38	V
T_J range	-55 to 150	$^\circ\text{C}$

Description/Features

The 42CTQ030L center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. 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
- Center tap TO-262 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



42CTQ030L

Preliminary Data Sheet PD-20573 11/98



Voltage Ratings

Part number	42CTQ030L
V _R Max. DC Reverse Voltage (V)	30
V _{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	42CTQ..L	Units	Conditions
I _{F(AV)} Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	20	A	50% duty cycle @ T _C = 121°C, rectangular waveform
	40		
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1100	A	5µs Sine or 3µs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V _{RRM} applied
	360		
E _{AS} Non-Repetitive Avalanche Energy (Per Leg)	13	mJ	T _J = 25 °C, I _{AS} = 3 Amps, L = 2.90 mH
I _{AR} Repetitive Avalanche Current (Per Leg)	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	42CTQ..L	Units	Conditions
V _{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.48	V	@ 20A
	0.57	V	@ 40A
	0.38	V	@ 20A
	0.51	V	@ 40A
I _{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	3	mA	T _J = 25 °C
	183	mA	T _J = 125 °C
V _{F(TO)} Threshold Voltage	0.22	V	T _J = T _J max.
r _t Forward Slope Resistance	6.76	mΩ	
C _T Max. Junction Capacitance (Per Leg)	2840	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	42CTQ..L	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) * See Fig. 4	2.0	°C/W	DC operation
R _{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.0	°C/W	DC operation
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)	
Case Style	TO-262		Modified JEDEC

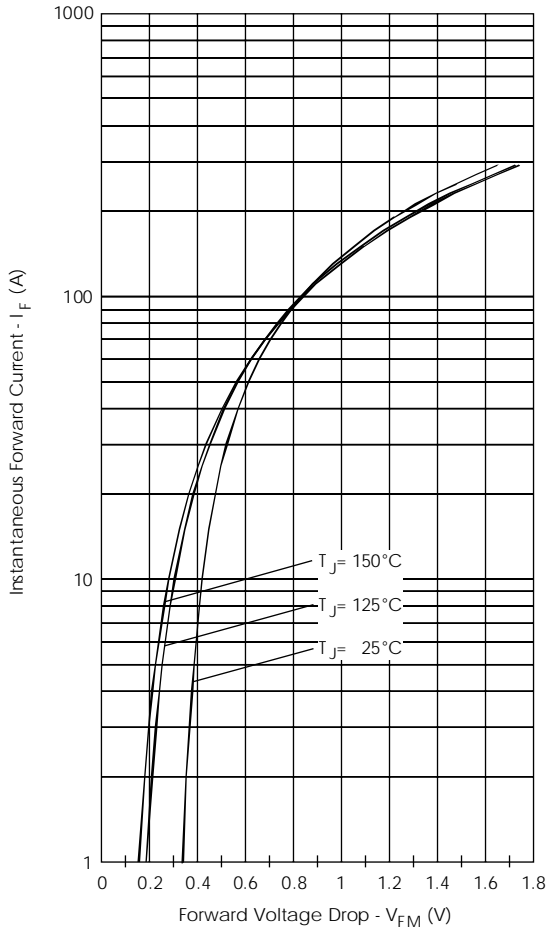


Fig. 1 - Max. Forward Voltage Drop Characteristics (PerLeg)

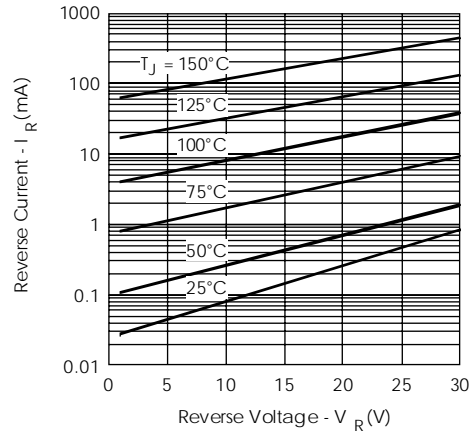


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

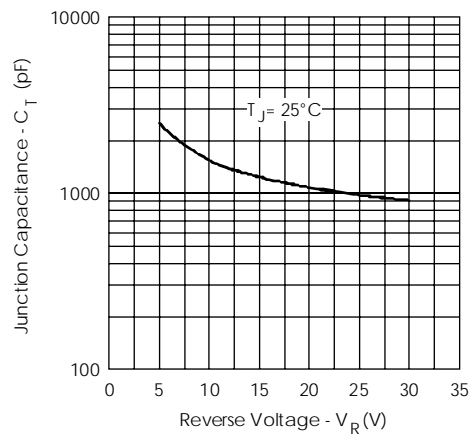


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

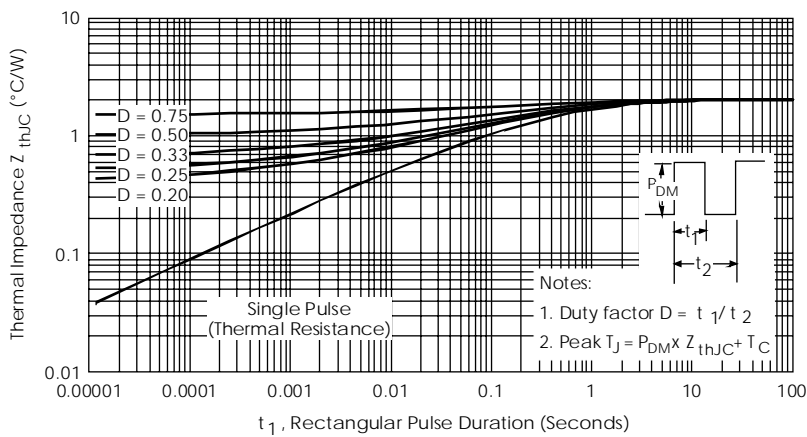


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

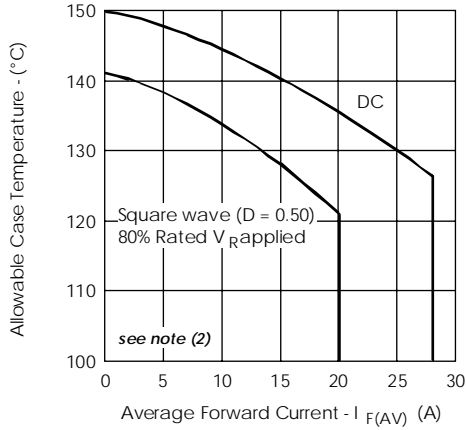


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

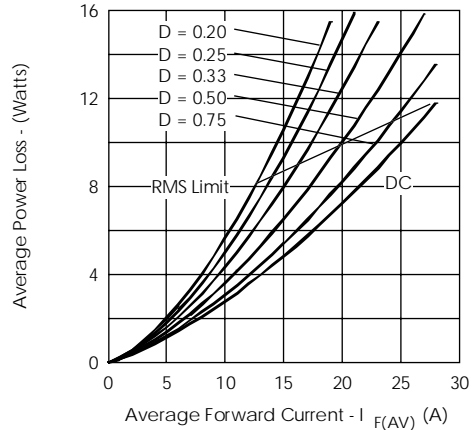


Fig. 6- Forward Power Loss Characteristics (Per Leg)

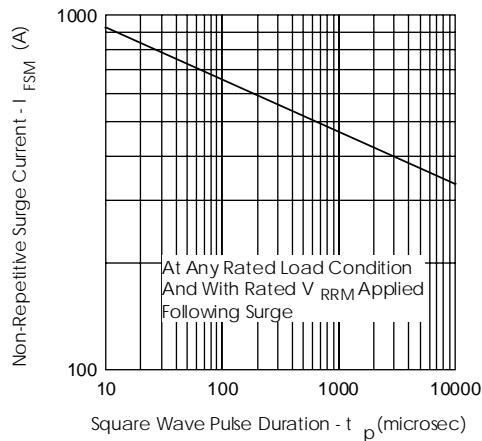


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

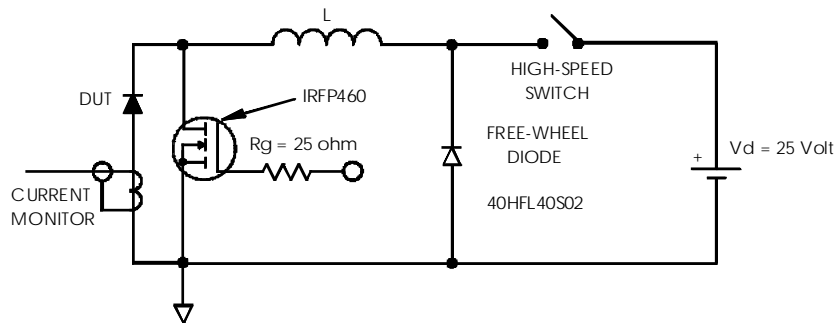


Fig. 8 - Unclamped Inductive Test Circuit

- (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

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Data and specifications subject to change without notice.