

12CTQ... SERIES

SCHOTTKY RECTIFIER

12 Amp

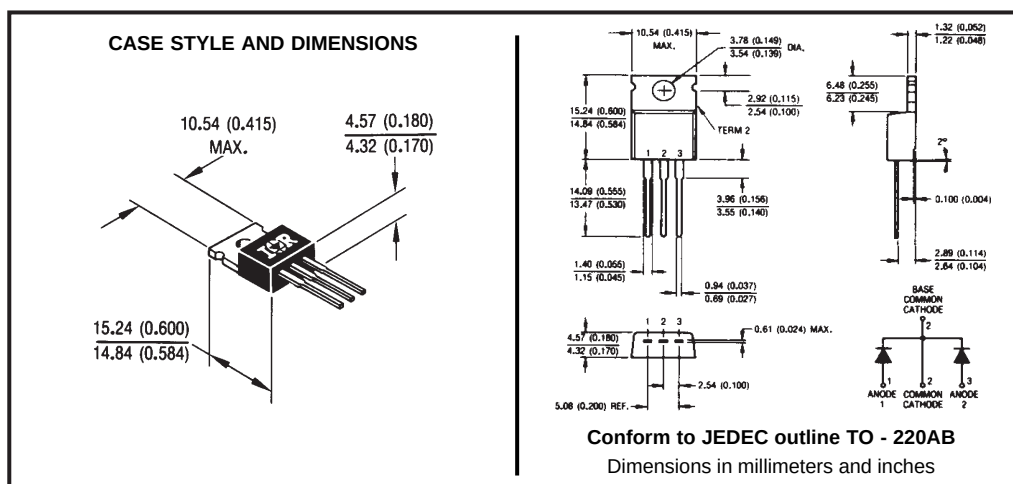
Major Ratings and Characteristics

Characteristics	12CTQ...	Units
$I_{F(AV)}$ Rectangular waveform	12	A
V_{RRM} range	35 to 45	V
I_{FSM} @ $t_p = 5 \mu s$ sine	690	A
V_F @ 6 Apk, $T_J = 125^\circ C$ (per leg)	0.51	V
T_J range	-55 to 175	$^\circ C$

Description/Features

The 12CTQ center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to $175^\circ C$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $175^\circ C$ 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



Voltage Ratings

Part number	12CTQ035	12CTQ040	12CTQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters		12CTQ	Units	Conditions		
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 5	12	A	50% duty cycle @ $T_C = 157^{\circ}\text{C}$, rectangular wave form		
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	690	A	5 μs Sine or 3 μs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied	
		140		10ms Sine or 6ms Rect. pulse		
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	8	mJ	$T_J = 25^{\circ}\text{C}$, $I_{AS} = 1.20$ Amps, $L = 11.10$ mH		
I_{AR}	Repetitive Avalanche Current (Per Leg)	1.20	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		12CTQ	Units	Conditions	
V _{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.57	V	@ 6A	T _J = 25 °C
		0.69	V	@ 12A	
		0.51	V	@ 6A	T _J = 125 °C
		0.63	V	@ 12A	
I _{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.8	mA	T _J = 25 °C	V _R = rated V _R
		7.0	mA	T _J = 125 °C	
C _T	Max. Junction Capacitance (Per Leg)	400	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 < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters		12CTQ	Units	Conditions
T _j	Max. Junction Temperature Range	-55 to 175	°C	
T _{stg}	Max. Storage Temperature Range	-55 to 175	°C	
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)	3.50	°C/W	DC operation * See Fig. 4
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Package)	1.75	°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-220AB	JEDEC	

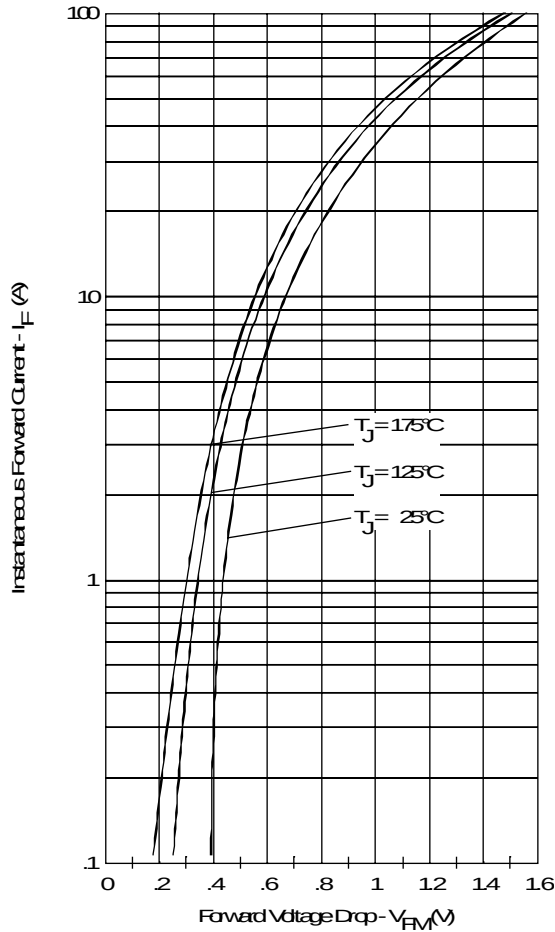


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

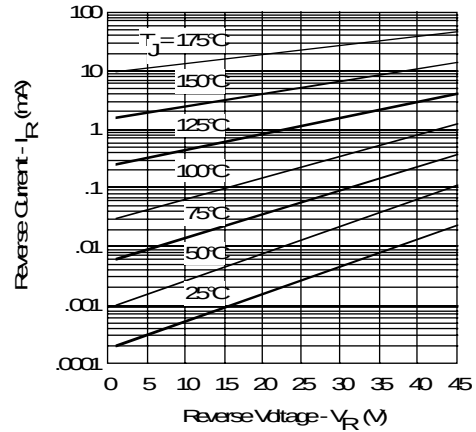


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

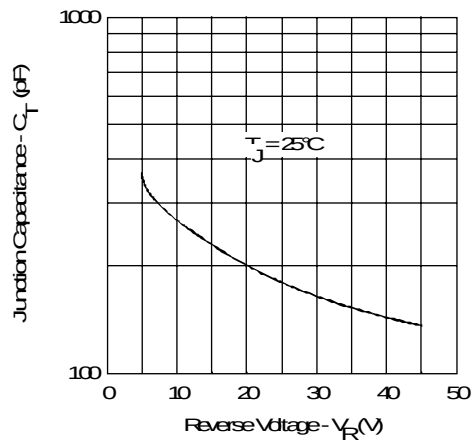


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

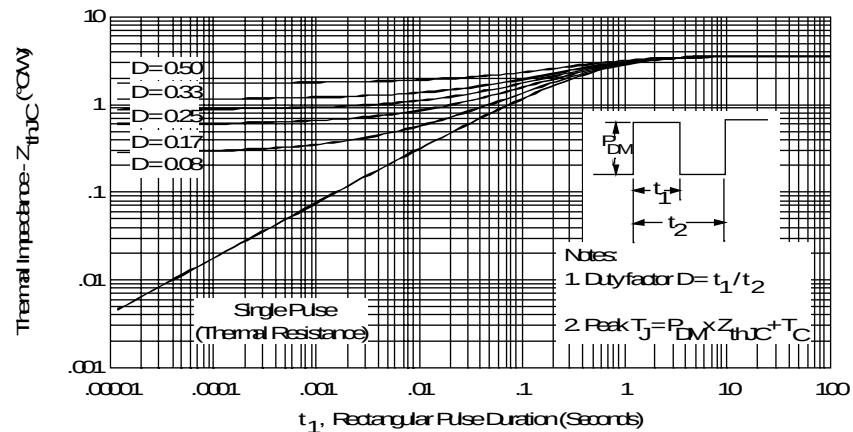


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

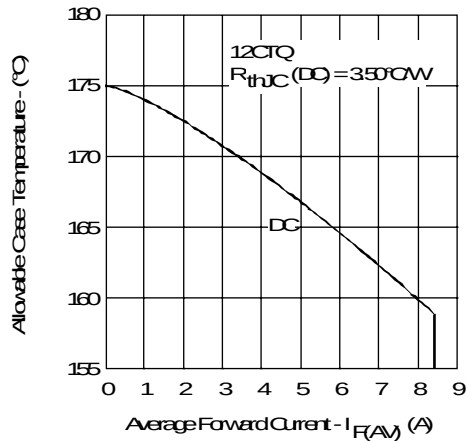


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

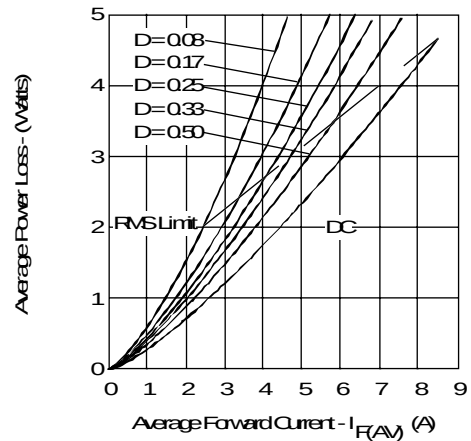


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

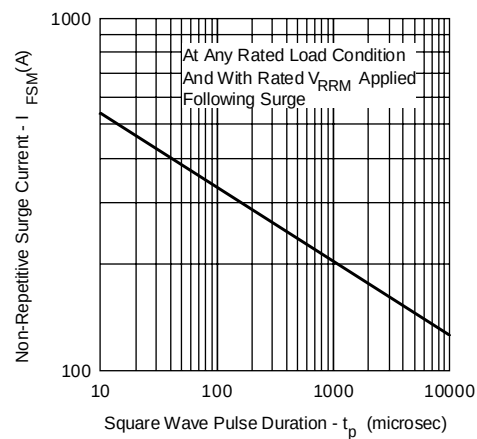


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

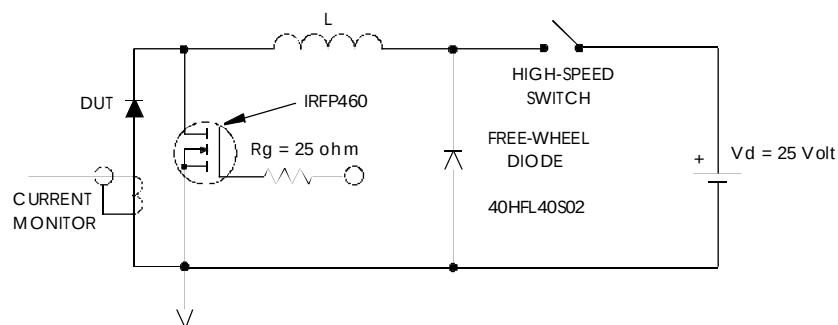


Fig. 8 - Unclamped Inductive Test Circuit