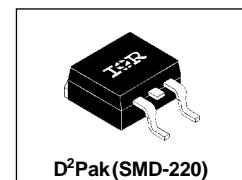


SCHOTTKY RECTIFIER

12 Amp



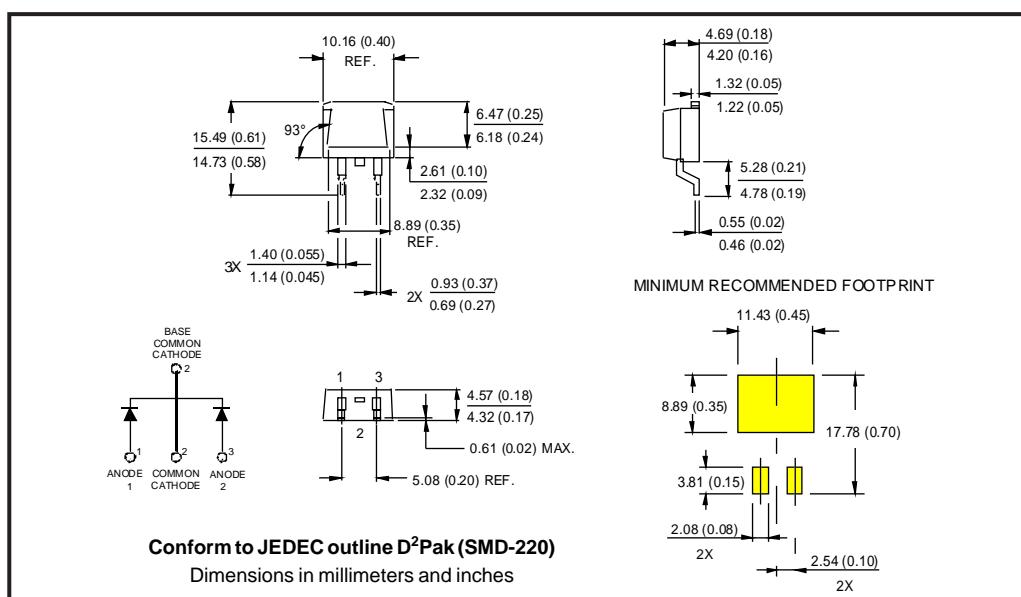
Major Ratings and Characteristics

Characteristics	12CTQ...S	Units
I _{F(AV)} Rectangular waveform	12	A
V _{RRM} range	35 to 45	V
I _{FSM} @ tp = 5 µs sine	690	A
V _F @ 6 Apk, T _J = 125°C (per leg)	0.53	V
T _J range	-55 to 175	°C

Description/Features

The 12CTQ...S 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° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- Center tap D²Pak (SMD-220)
- 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	12CTQ035S	12CTQ040S	12CTQ045S
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	12CTQ...S	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	6	A	50% duty cycle @ $T_J = 160^\circ\text{C}$, rectangular waveform
	12		
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	690	A	5μs Sine or 3μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
	140		
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...S	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.60	V	$T_J = 25^\circ\text{C}$
	0.73	V	
	0.53	V	$T_J = 125^\circ\text{C}$
	0.64	V	
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.8	mA	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
	7.0	mA	
$V_{F(TO)}$ Threshold Voltage	0.35	V	$T_J = T_J$ max.
r_t Forward Slope Resistance	18.23	$\text{m}\Omega$	
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 < 300μs, Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters	12CTQ...S	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	3.50	°C/W	DC operation * See Fig. 4
wt Approximate Weight	2(0.07)	g(oz.)	
Case Style	D ² Pak(SMD-220)		

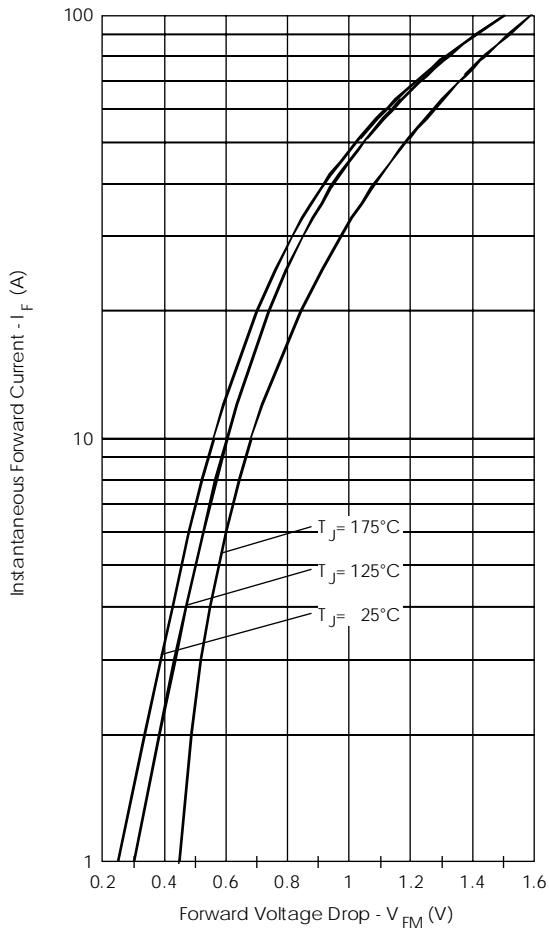


Fig. 1 - Max. Forward Voltage Drop Characteristics
 (PerLeg)

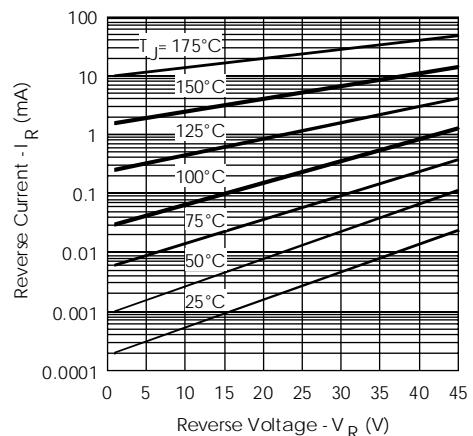


Fig. 2 - Typical Values Of Reverse Current
 Vs. Reverse Voltage (PerLeg)

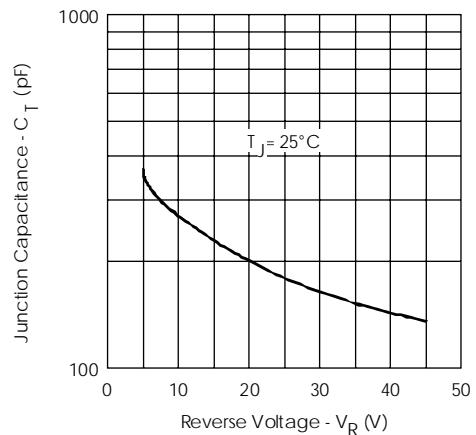


Fig. 3 - Typical Junction Capacitance
 Vs. Reverse Voltage (PerLeg)

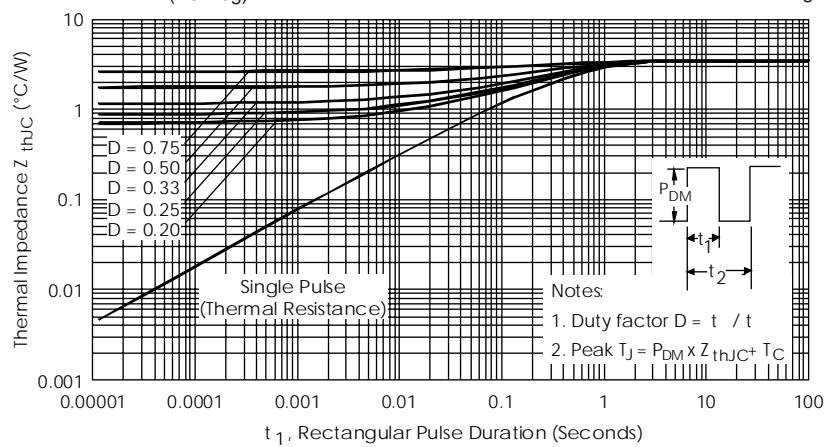


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (PerLeg)

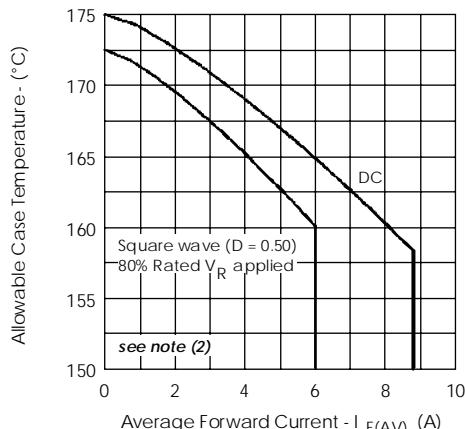


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

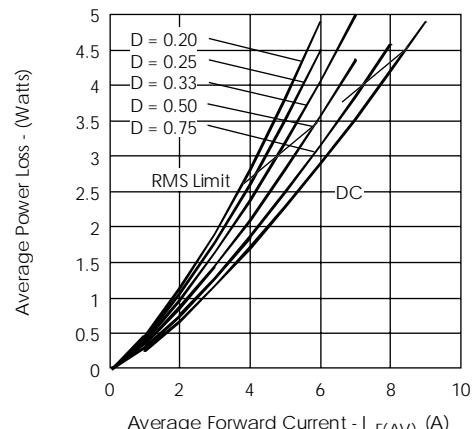


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

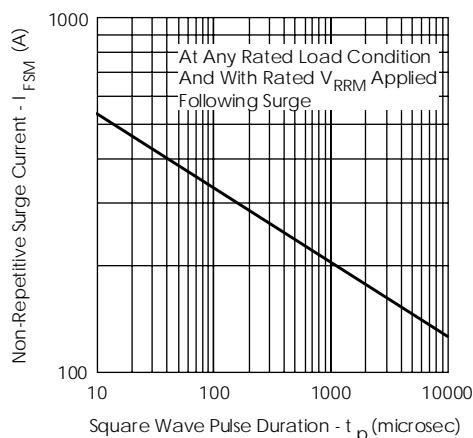


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

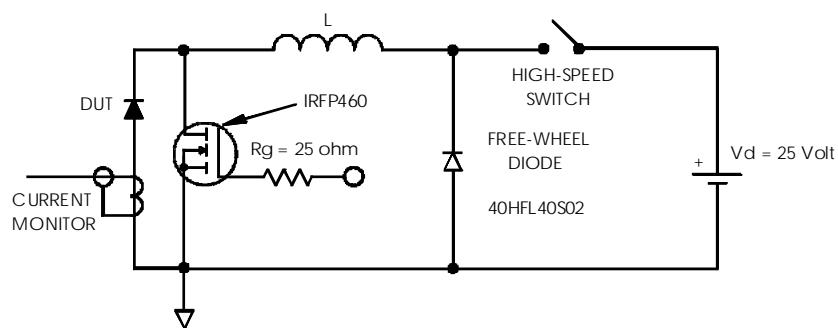


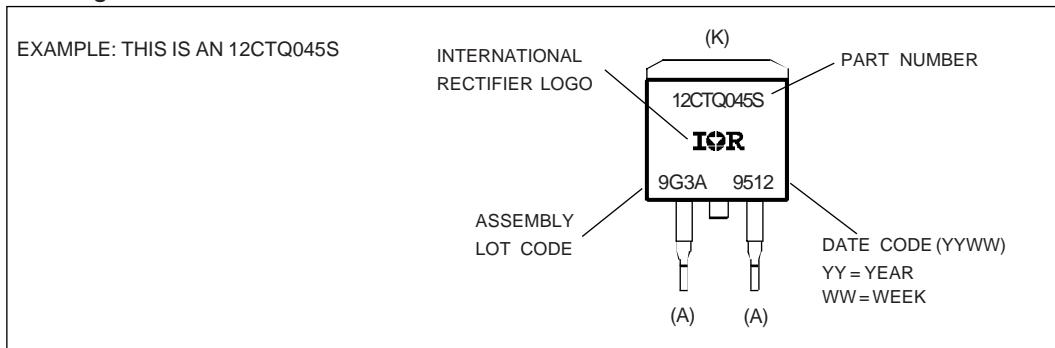
Fig. 8 - Unclamped Inductive Test Circuit

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

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

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

Marking Information



Tape & Reel Information

