

12CTQ...S Series

SCHOTTKY RECTIFIER

12 Amp



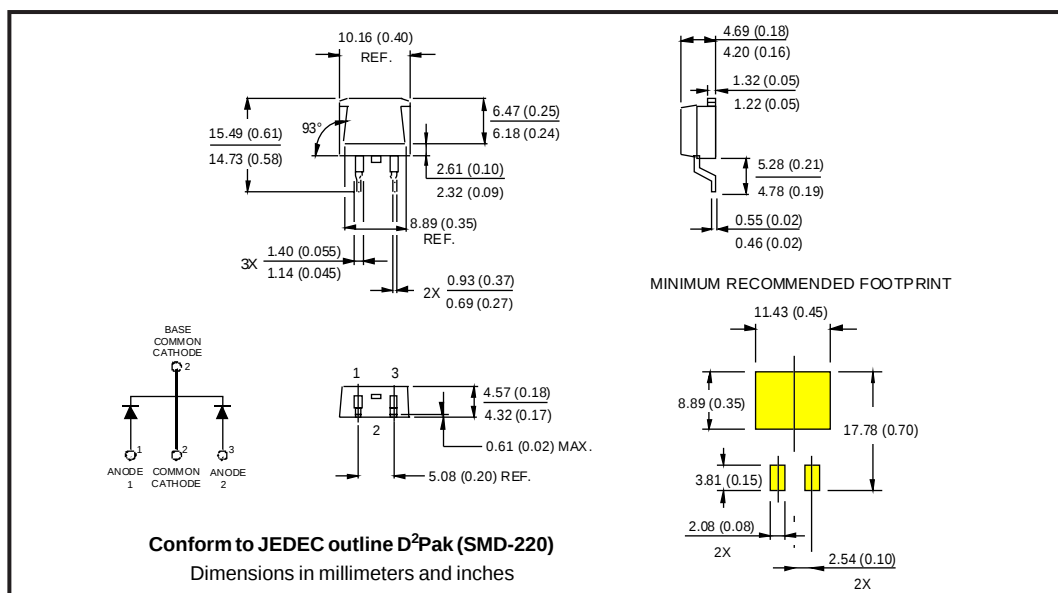
Major Ratings and Characteristics

Characteristics	12CTQ...S	Units
$I_{F(AV)}$ Rectangular waveform	12	A
V_{RRM} range	35 to 45	V
I_{FSM} @ $t_p=5\mu s$ sine	690	A
V_F @ 6 Apk, $T_J=125^\circ C$ (per leg)	0.53	V
T_J range	-55 to 175	$^\circ C$

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 $175^\circ C$ 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 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 12	A	50% duty cycle @ $T_C = 160^\circ\text{C}$, rectangular waveform
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	690 140	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RWM} applied
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	@ 6A $T_J = 25^\circ\text{C}$
	0.73	V	@ 12A
	0.53	V	@ 6A $T_J = 125^\circ\text{C}$
	0.64	V	@ 12A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.8	mA	$T_J = 25^\circ\text{C}$
	7.0	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.35	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	18.23	m Ω	
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...S	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case	3.50	$^\circ\text{C/W}$	DC operation * See Fig. 4
wt Approximate Weight	2(0.07)	g(oz.)	
Case Style	D ² Pak(SMD-220)		

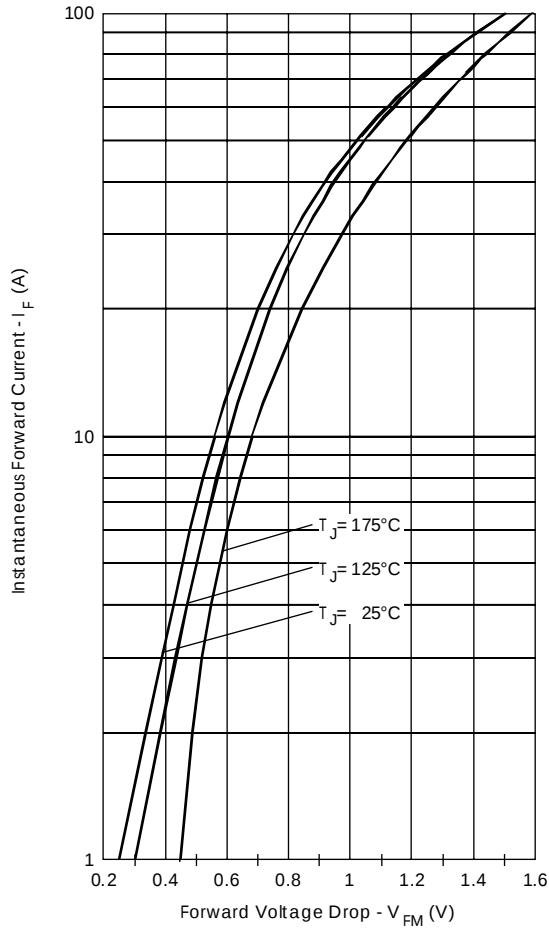


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

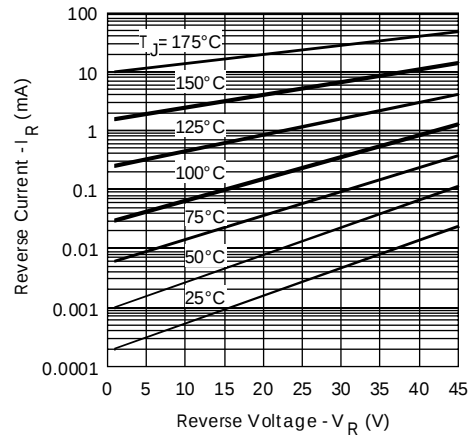


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

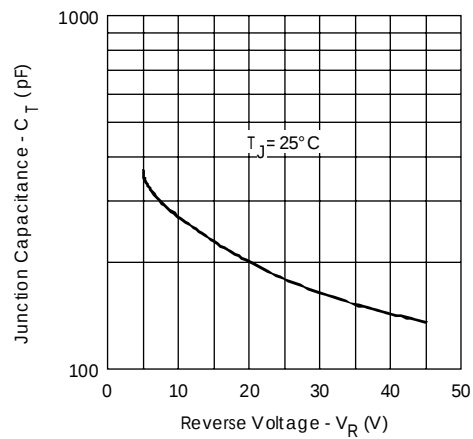


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

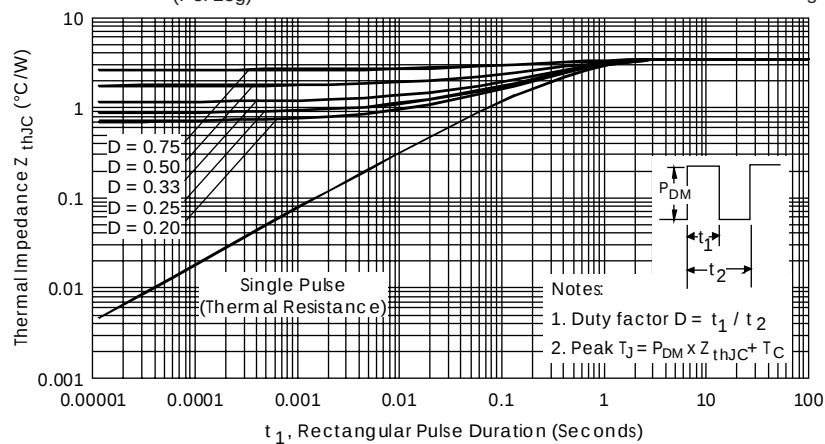


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

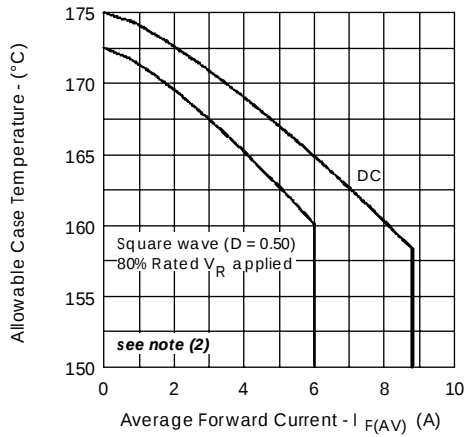


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

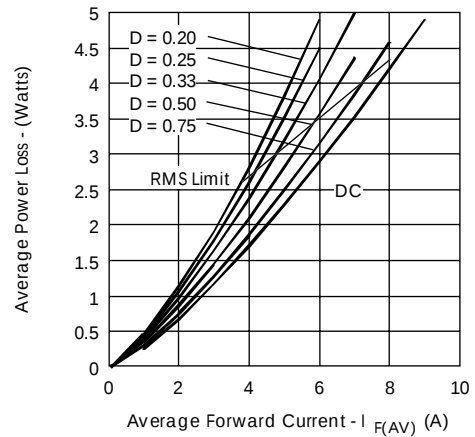


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

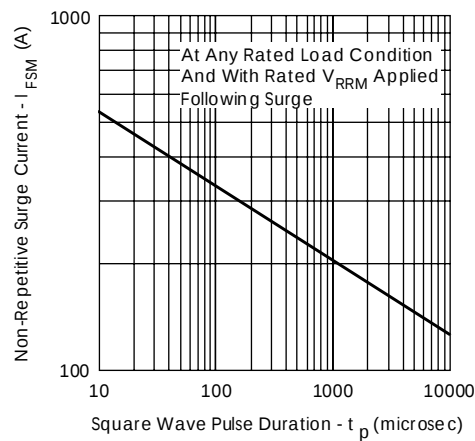


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

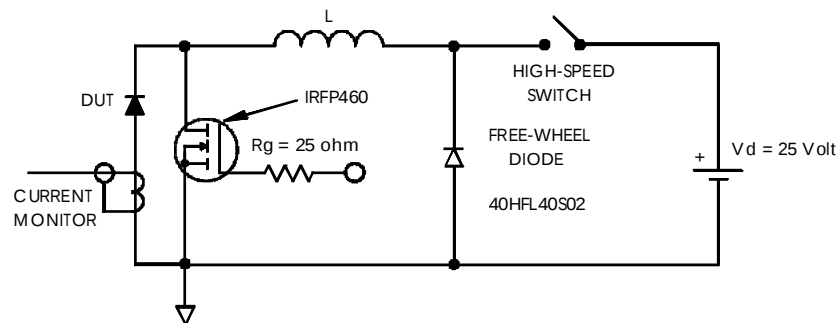


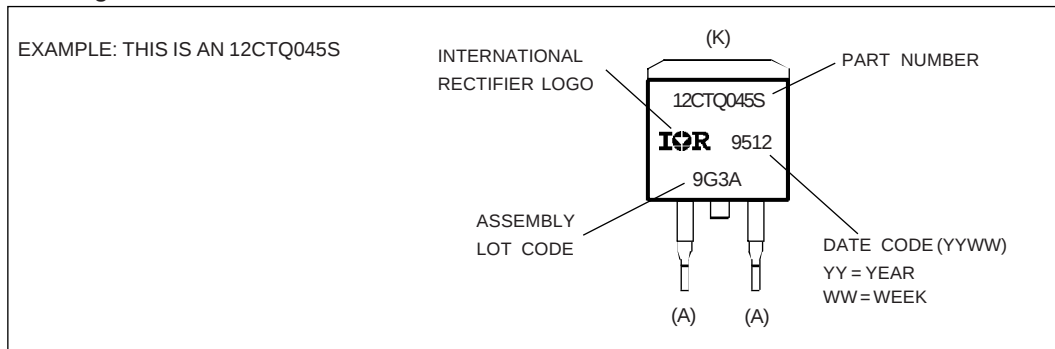
Fig. 8 - Unclamped Inductive Test Circuit

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

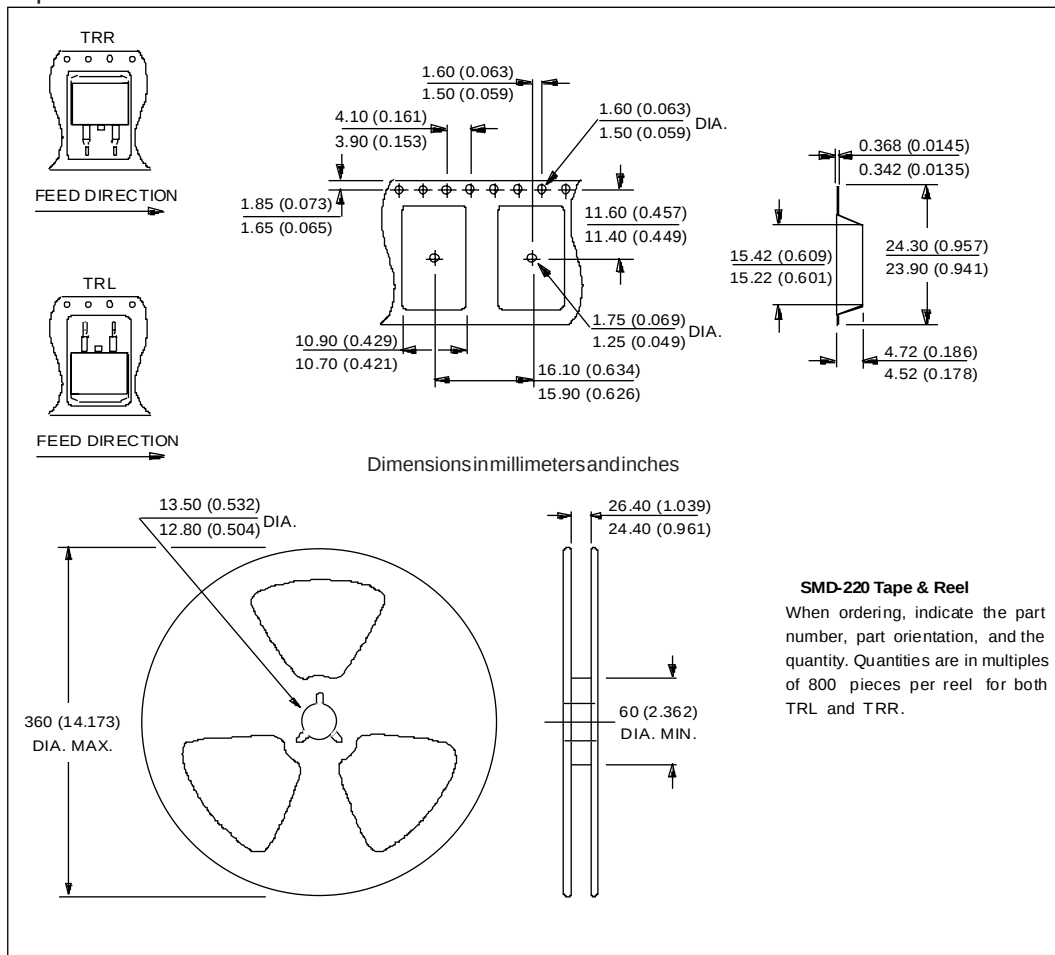
P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

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

Marking Information



Tape & Reel Information



International
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