

International
IR Rectifier

10CTQ150
 10CTQ150S
 10CTQ150-1

SCHOTTKY RECTIFIER

10 Amp

Major Ratings and Characteristics

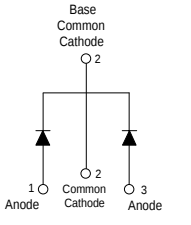
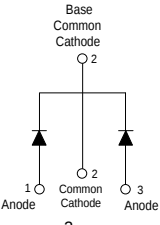
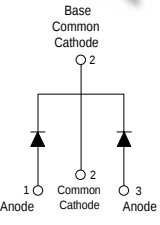
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	10	A
V_{RRM}	150	V
I_{FSM} @ $t_p = 5 \mu s$ sine	620	A
V_F @ 5 Apk, $T_J = 125^\circ C$ (per leg)	0.73	V
T_J range	-55 to 175	$^\circ C$

Description/ Features

This center tap Schottky rectifier 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 configuration
- 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

Case Styles

10CTQ150	10CTQ150S	10CTQ150 -1
  TO-220	  D ² PAK	  TO-262

Voltage Ratings

Parameters	10CTQ150 10CTQ150S 10CTQ150-1
V_R Max. DC Reverse Voltage (V)	150
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward (Per Leg) Current * See Fig. 5 (Per Device)	5 10	A	50% duty cycle @ $T_C = 155^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	620 115	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	6.75	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 0.30$ Amps, $L = 150$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	0.30	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	Values	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.93	V	@ 5A $T_J = 25^\circ\text{C}$
	1.10	V	@ 10A
	0.73	V	@ 5A $T_J = 125^\circ\text{C}$
	0.86	V	@ 10A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.05	mA	$T_J = 25^\circ\text{C}$
	7	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.468	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	28	m Ω	
C_T Max. Junction Capacitance (Per Leg)	200	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)	10000	V/ μs	

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	Values	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 (Per Leg)	3.50	$^\circ\text{C/W}$	DC operation
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.75	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink (only for TO-220)	0.50	$^\circ\text{C/W}$	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)	

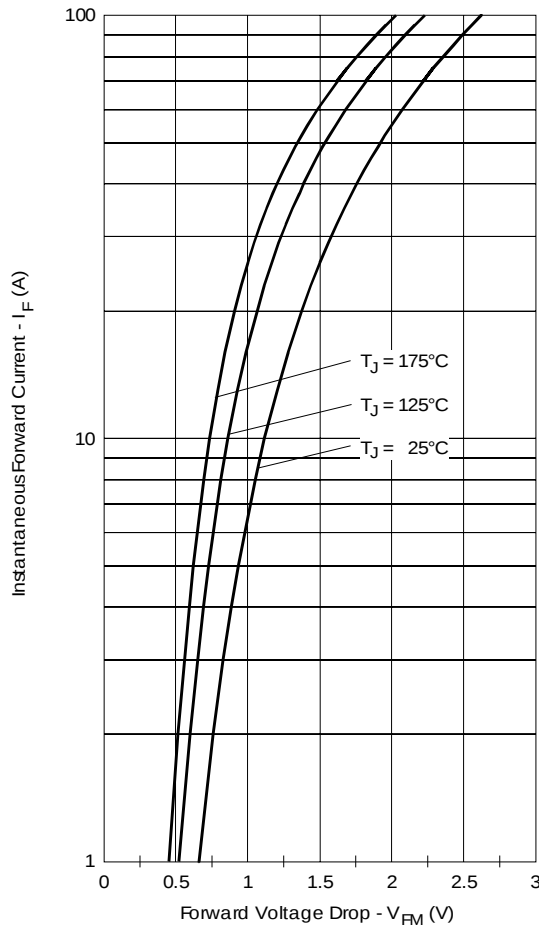


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

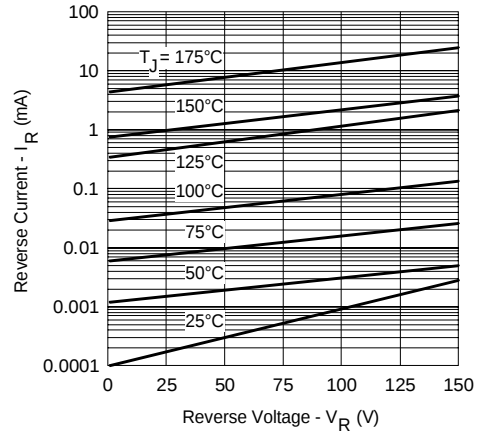


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

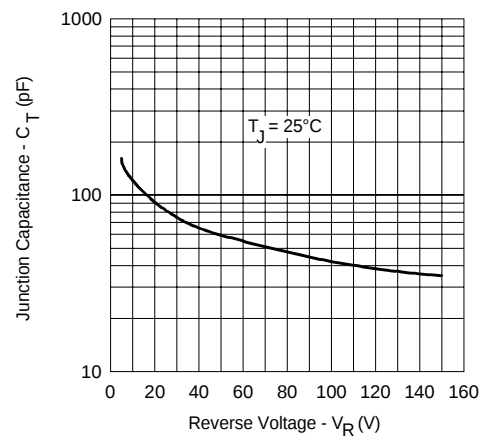


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

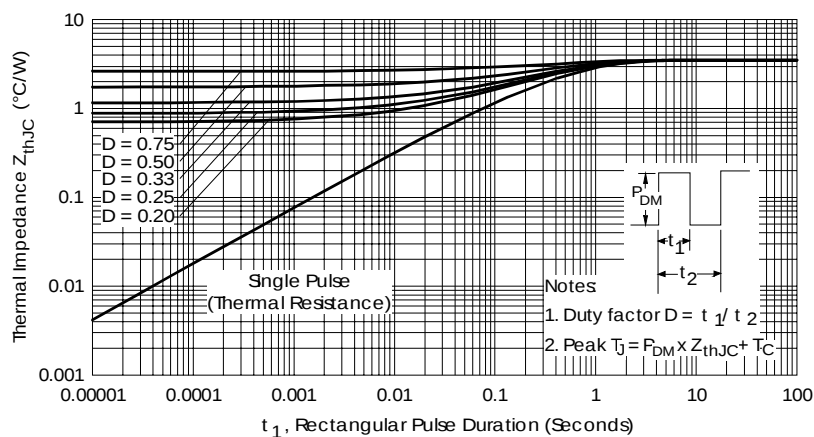


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

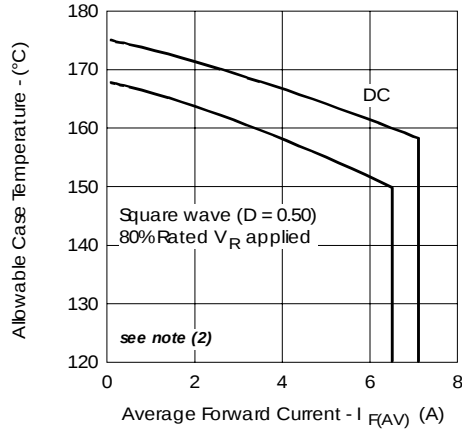


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

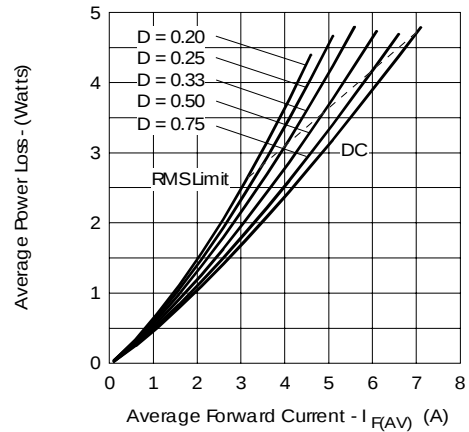


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

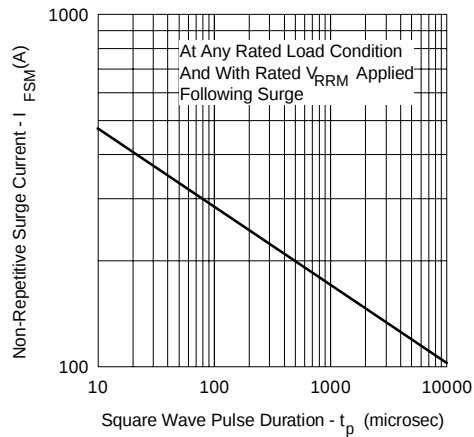


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

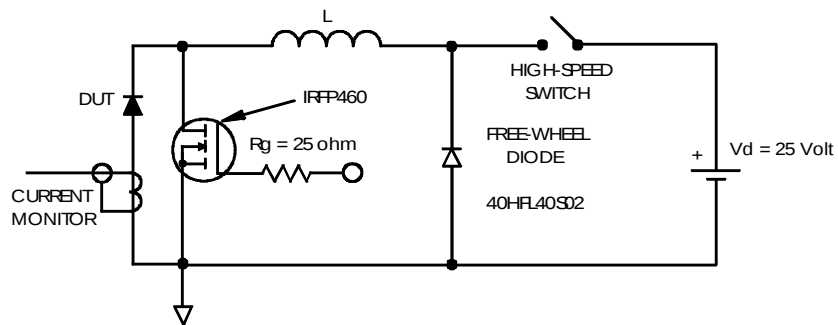


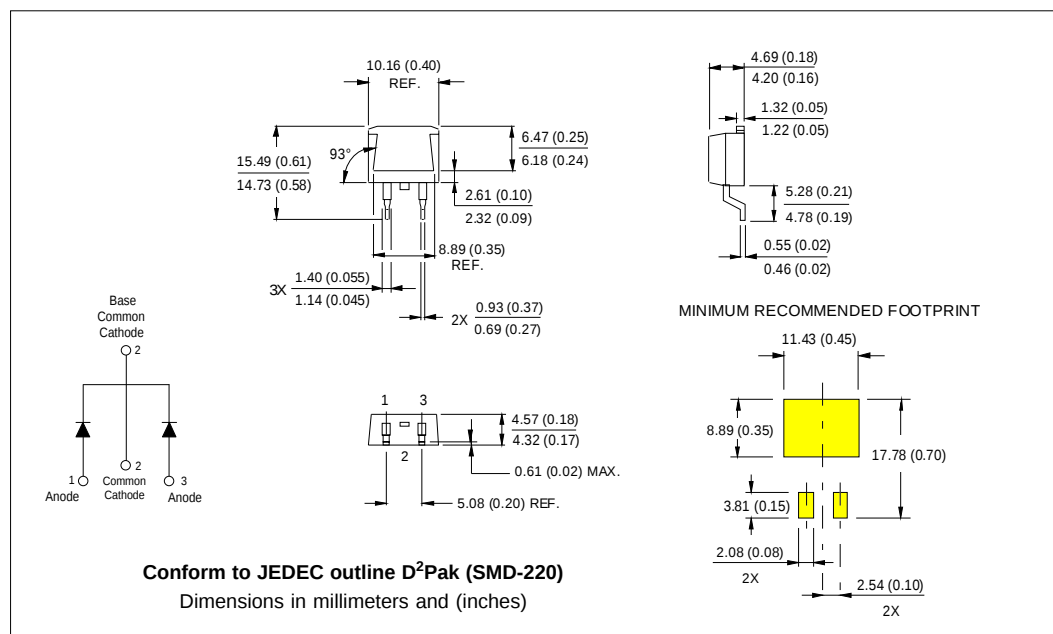
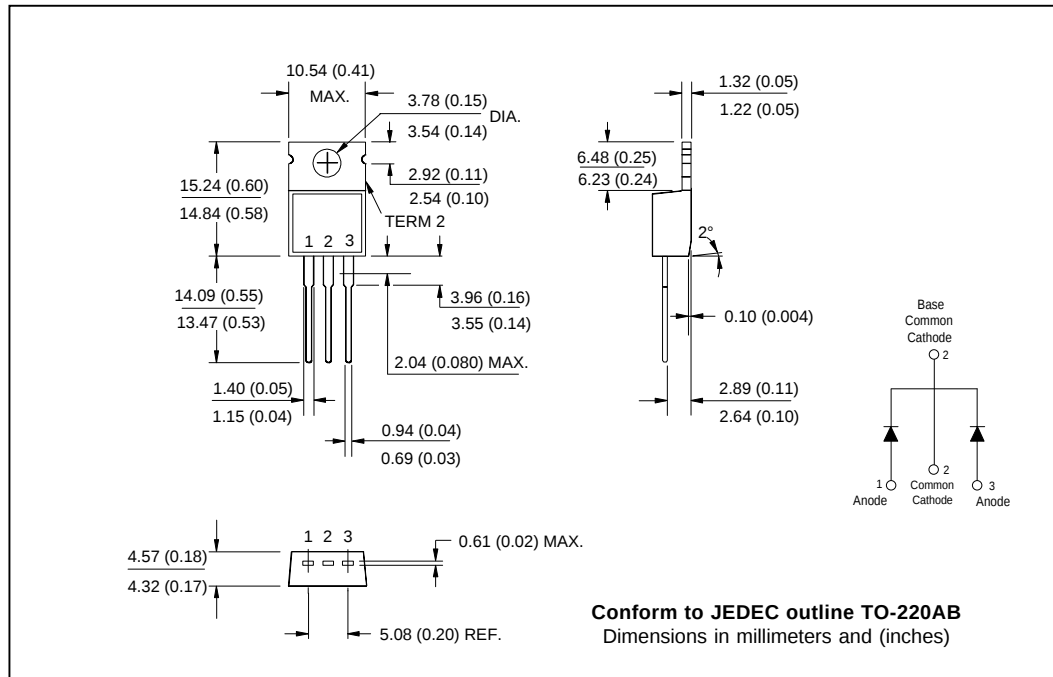
Fig. 8 - Unclamped Inductive Test Circuit

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

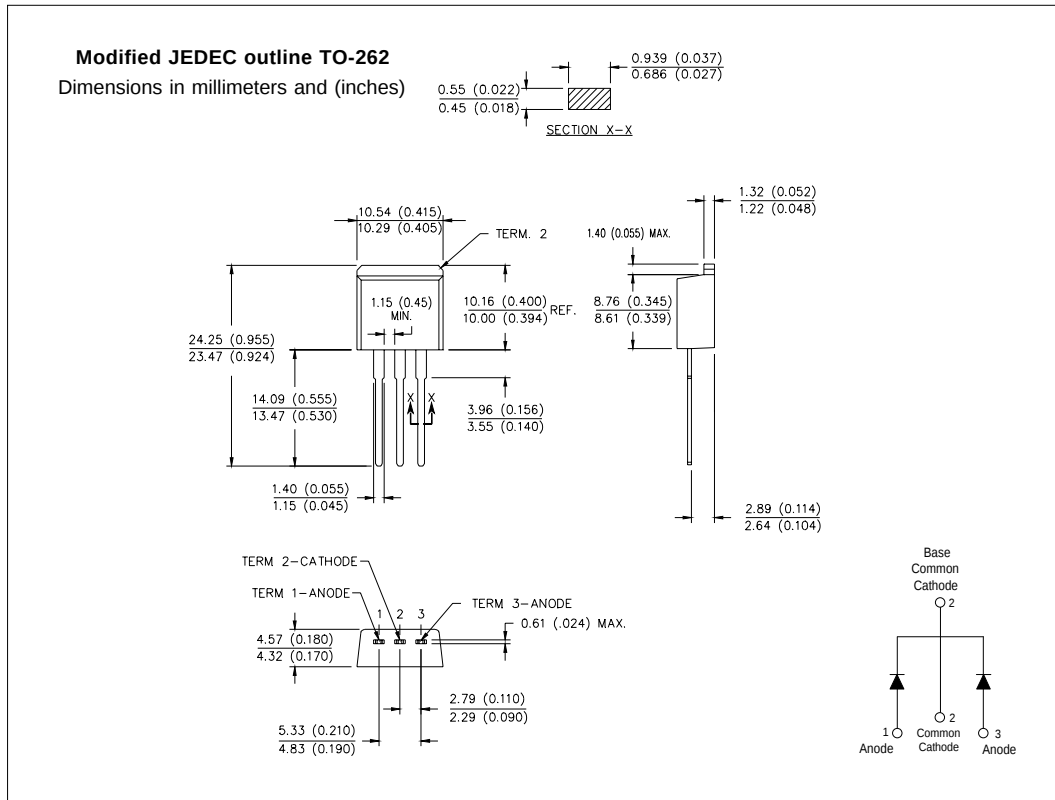
P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 10 \text{ V}$

Outline Table

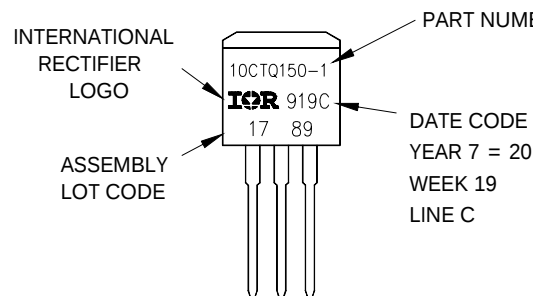


Outline Table

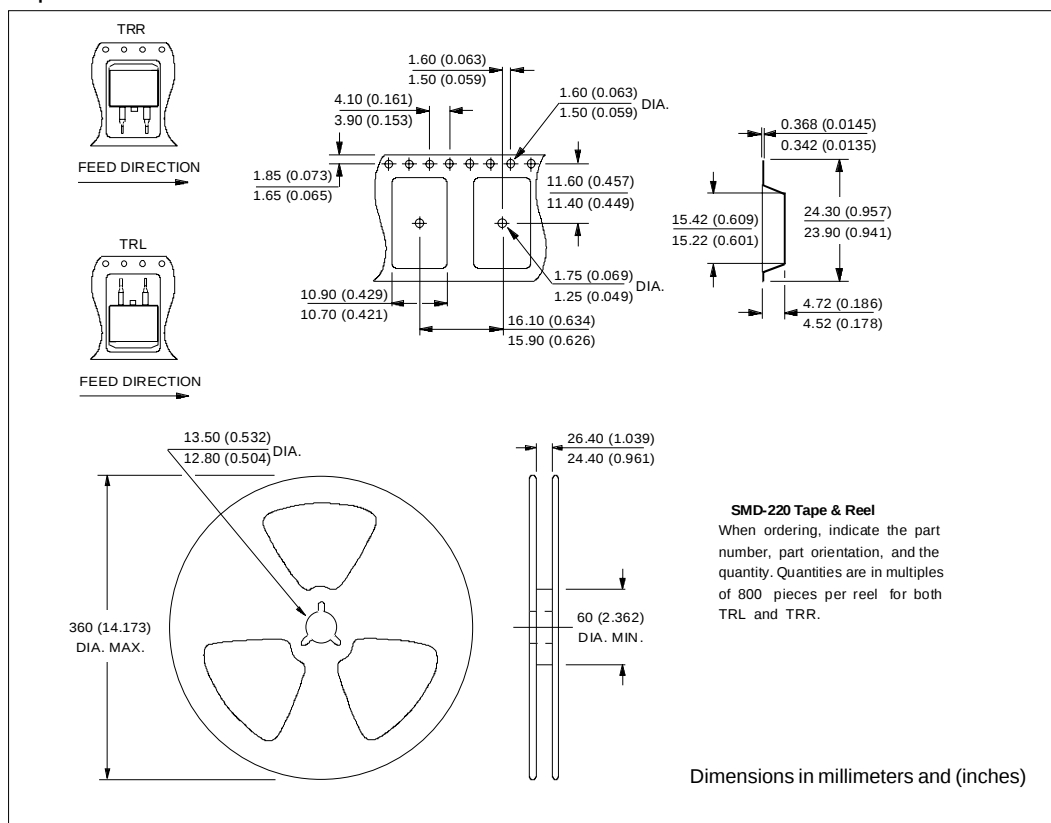


Marking Information

EXAMPLE: THIS IS A 10CTQ150-1
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"



Tape & Reel Information



Ordering Information Table

Device Code

10	C	T	Q	150	-1
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Diagram illustrating the Device Code structure for the TO-262 package:

- 1: Essential Part Number
- 2: C = Common Cathode
- 3: T = TO-220
- 4: Q = Schottky Q Series
- 5: Voltage Rating 150 = 150V
- 6: 1 = TO-262
S = D²Pak

10CTQ150, 10CTQ150S, 10CTQ150-1

Bulletin PD-2.291 rev. C 03/03

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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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