

International
IOR Rectifier

10CTQ150SPbF
10CTQ150-1PbF

SCHOTTKY RECTIFIER

10 Amp

$$I_{F(AV)} = 10\text{Amp}$$

$$V_R = 150\text{V}$$

Major Ratings and Characteristics

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

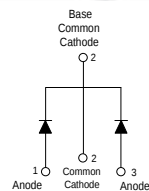
Description/ Features

This center tap Schottky ectifier 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 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
- Lead-Free ("PbF" suffix)

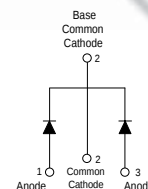
Case Styles

10CTQ150SPbF



D²PAK

10CTQ150-1PbF



TO-262

Voltage Ratings

Parameters	10CTQ150SPbF, 10CTQ150-1PbF
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	10000	V/ μs	(Rated V_R)

Thermal-Mechanical Specifications

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

Parameters		Values	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
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Package)	1.75	°C/W	DC operation
R _{thCS}	Typical Thermal Resistance, Case to Heatsink (only for TO-220)	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)		
	Marking Device	10CTQ150S	Case style D ² Pak	
		10CTQ150-1	Case style TO-262	

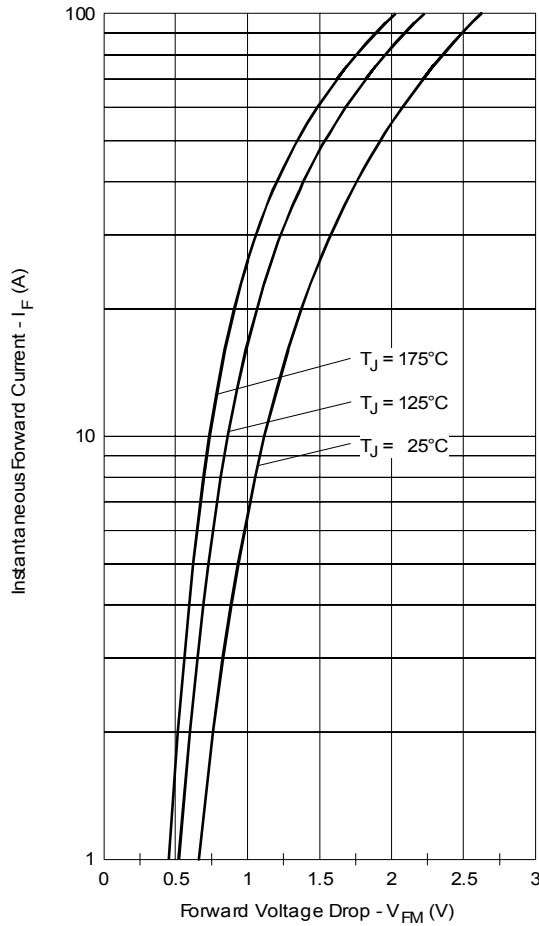


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

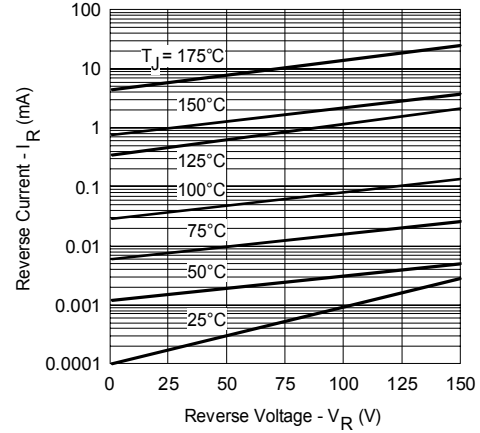


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

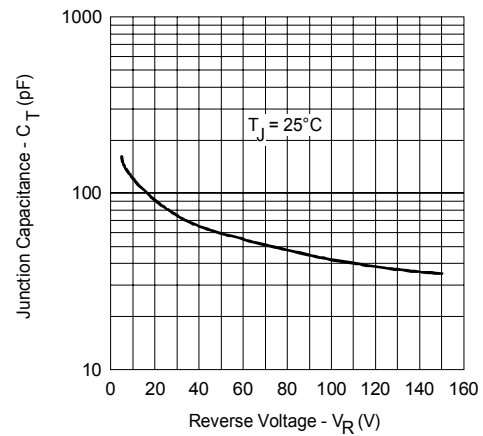


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

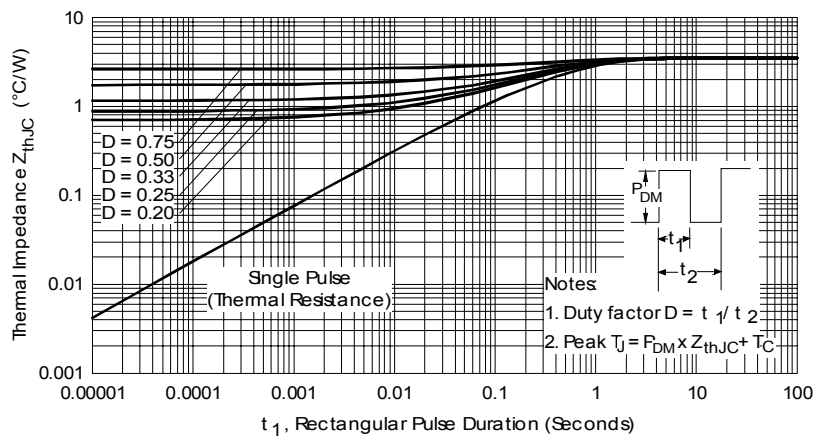


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

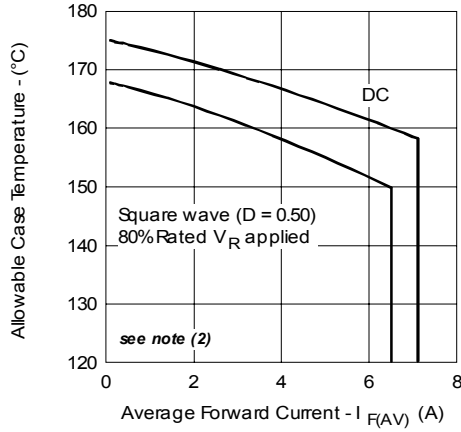


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

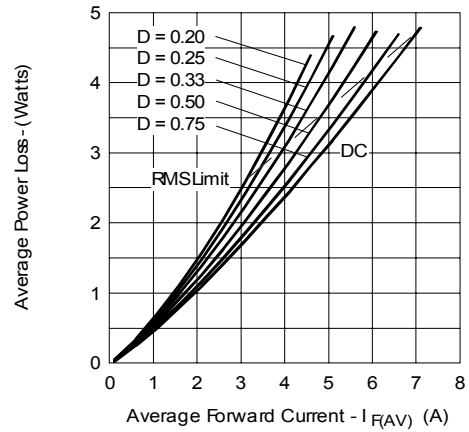


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

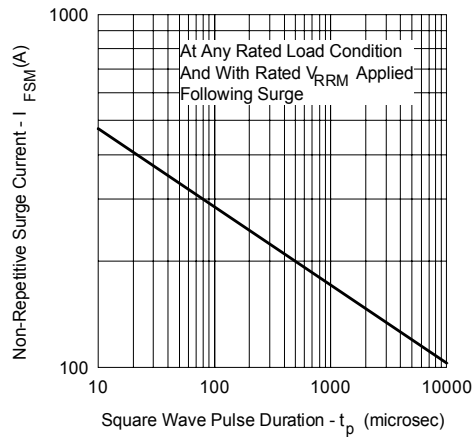


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

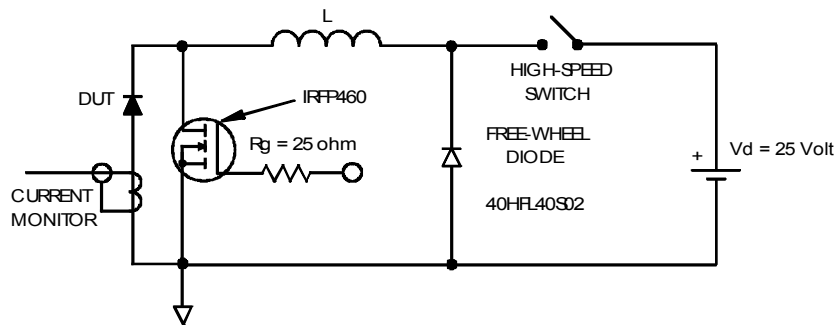


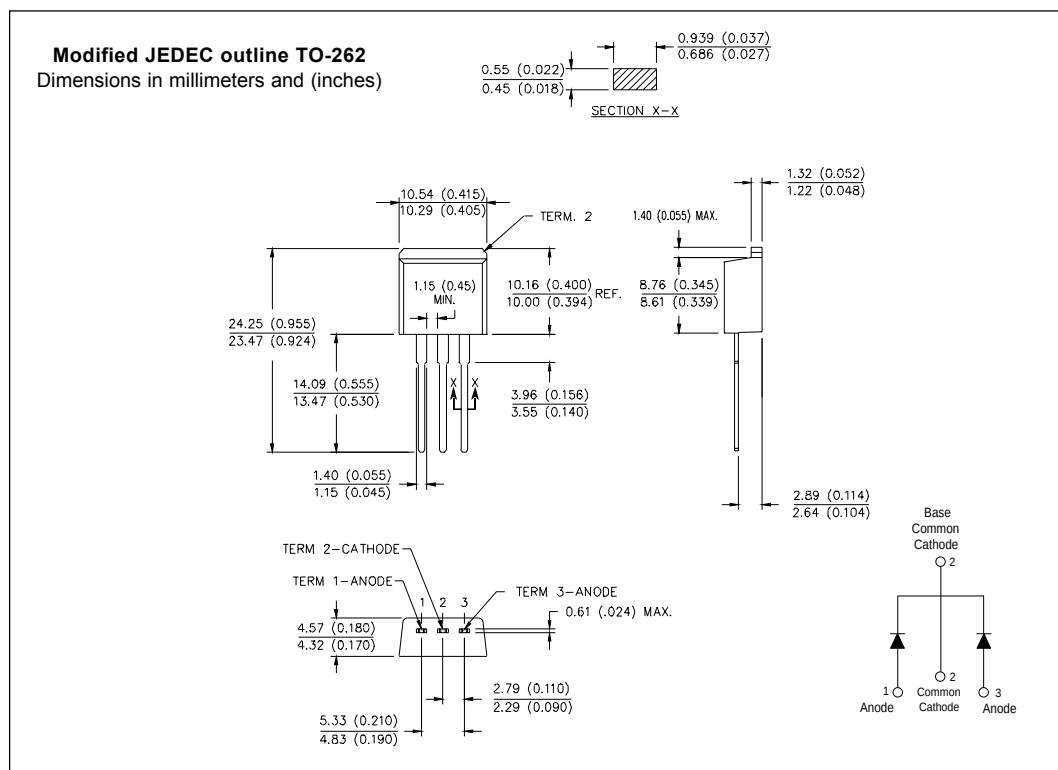
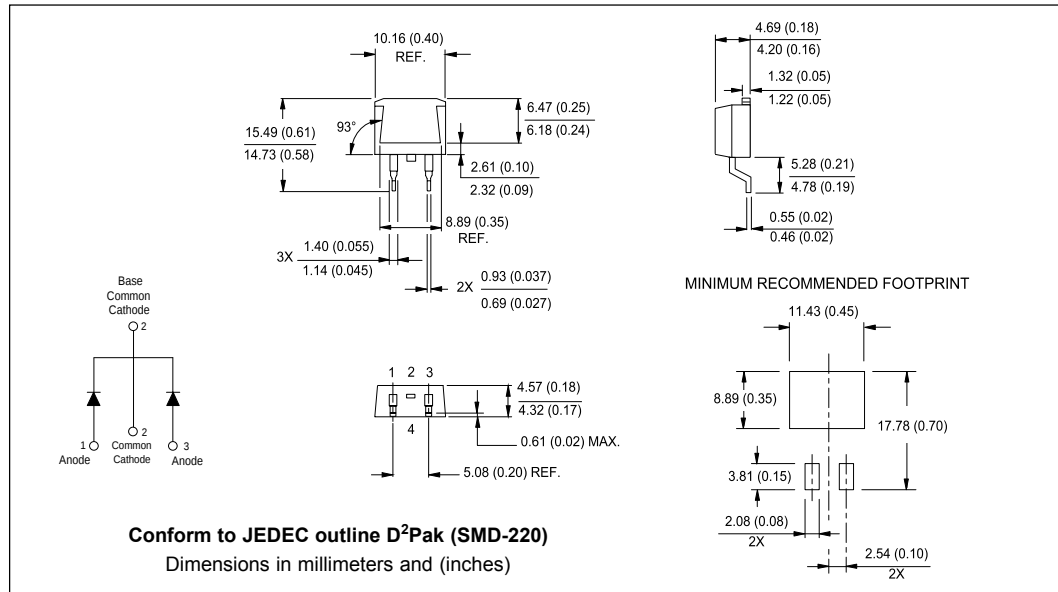
Fig. 8 - Unclamped Inductive Test Circuit

(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 = $V_{R1} \times I_{R1} (1 - D)$; $I_{R1} @ V_{R1} = 10 \text{ V}$

Outline Table



Part Marking Information

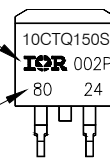
D²PAK

EXAMPLE: THIS IS A 10CTQ150S
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

Note: "P" in assembly line
position indicates "Lead-Free"

INTERNATIONAL
RECTIFIER
LOGO

ASSEMBLY
LOT CODE



PART NUMBER

DATE CODE

YEAR 0 = 2000

WEEK 02

P = LEAD-FREE

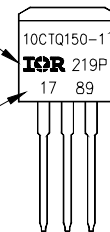
TO-262

EXAMPLE: THIS IS A 10CTQ150-1
LOT CODE 1789
ASSEMBLED ON WW 19, 2002

Note: "P" in assembly line
position indicates "Lead-Free"

INTERNATIONAL
RECTIFIER
LOGO

ASSEMBLY
LOT CODE



PART NUMBER

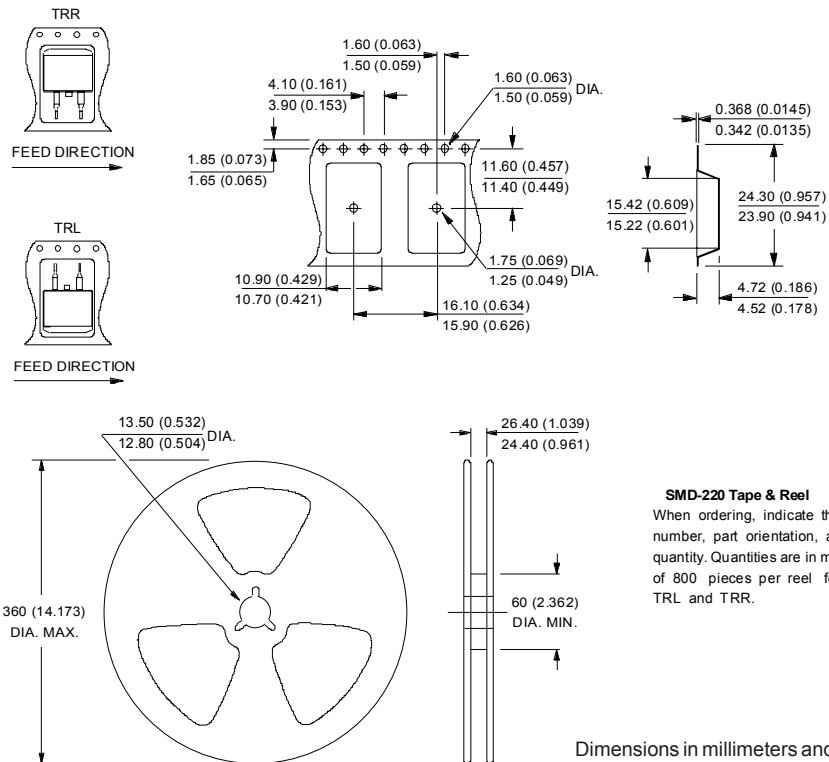
DATE CODE

YEAR 2 = 2002

WEEK 19

P = LEAD-FREE

Tape & Reel Information



Ordering Information Table

Device Code							
	10	C	T	Q	150	S	TRL PbF
	1	2	3	4	5	6	7 8
1	- Current Rating (10A)						
2	- Circuit Configuration						
	C = Common Cathode						
3	- T = TO-220						
4	- Schottky "Q" Series						
5	- Voltage Rating (150 = 150V)						
6	- • S = D ² Pak						
	• -1= TO-262						
7	- • none = Tube (50 pieces)						
	• TRL = Tape & Reel (Left Oriented - for D ² Pak only)						
	• TRR = Tape & Reel (Right Oriented - for D ² Pak only)						
8	- • none = Standard Production						
	• PbF = Lead-Free						

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

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 05/05