Bulletin PD-20648 rev. B 03/02

International
IOR Rectifier

20CTQ150
20CTQ150S
20CTQ150-1

SCHOTTKY RECTIFIER

20 Amp

Major Ratings and Characteristics

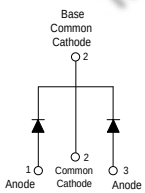
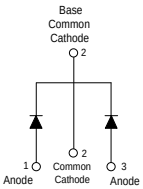
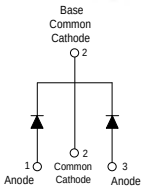
Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	20	A
V_{RRM}		150	V
I_{FSM}	@ tp = 5 µs sine	1030	A
V_F	@10 Apk, T_J = 125°C (per leg)	0.66	V
T_J	range	-55 to 175	°C

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

Case Styles

20CTQ150	20CTQ150S	20CTQ150-1
		
		
TO-220AB	D^2PAK	TO-262

Voltage Ratings

Parameters		20CTQ150 20CTQ150S 20CTQ150-1
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)	10	A	50% duty cycle @ T_C = 154°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	20			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	1030	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current (Per Leg) * See Fig. 7	180		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	2.45	mJ	T_J = 25 °C, I_{AS} = 0.7 Amps, L = 10 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	0.7	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

Parameters		Typ.	Max.	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1) (Per Leg) * See Fig. 1	0.80	0.83	V	@ 10A	T_J = 25 °C
		0.90	0.96	V	@ 20A	
		0.63	0.66	V	@ 10A	T_J = 125 °C
		0.73	0.77	V	@ 20A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2	3.0	25	µA	T_J = 25 °C	V_R = rated V_R
		2.7	5.0	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance (Per Leg)	-	280	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)	

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

Thermal-Mechanical Specifications

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)		2.0	°C/W	DC operation
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		1.0	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°C/W	Mounting surface, smooth and greased (only for TO-220)
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		

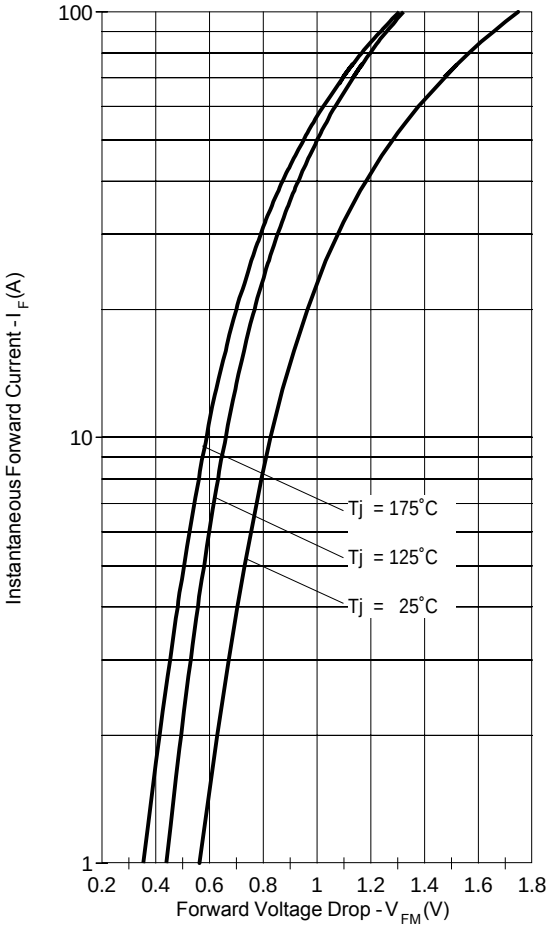


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

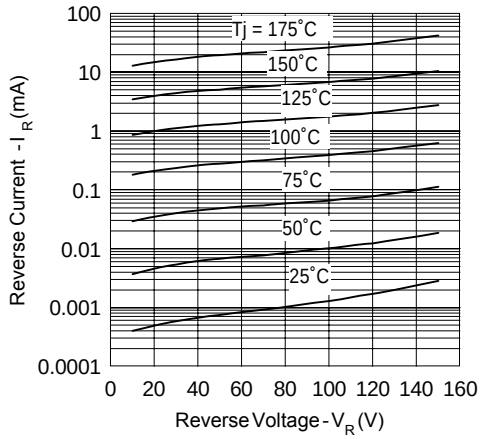


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

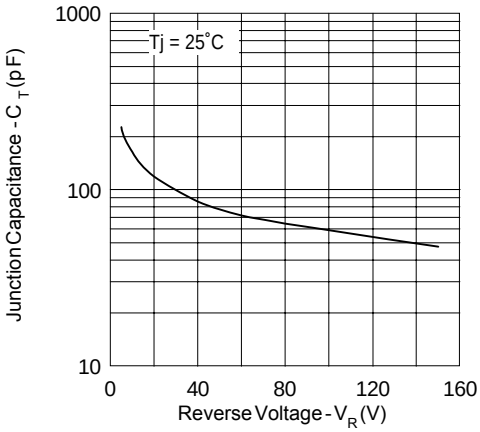


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

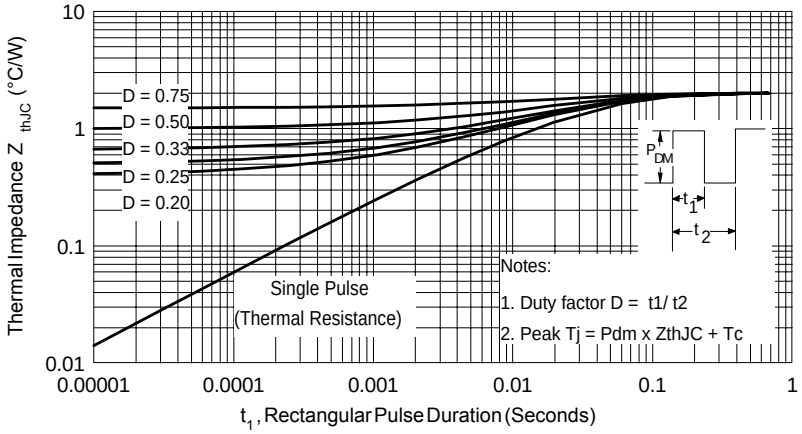


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

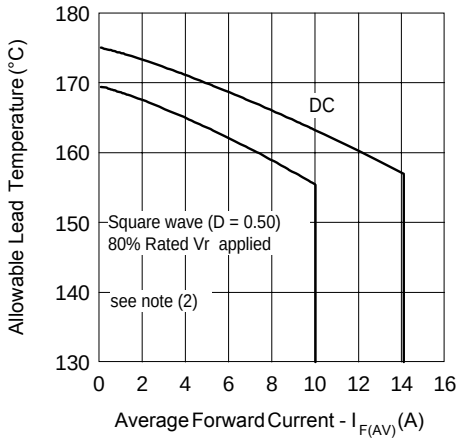


Fig. 5 - Maximum Average Forward Current Vs. Allowable Lead Temperature

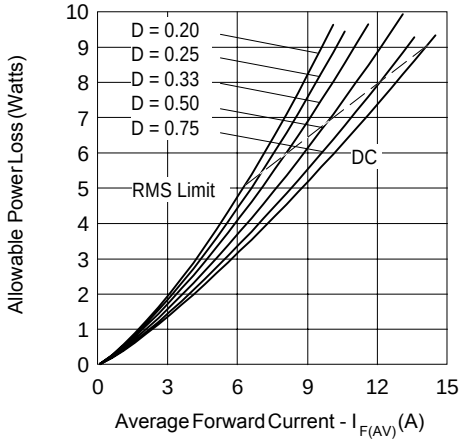


Fig. 6 - Maximum Average Forward Dissipation Vs. Average Forward Current

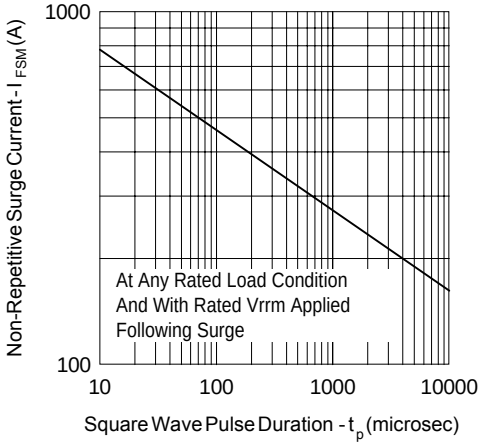


Fig. 7 - Maximum Peak Surge Forward Current Vs. Pulse Duration

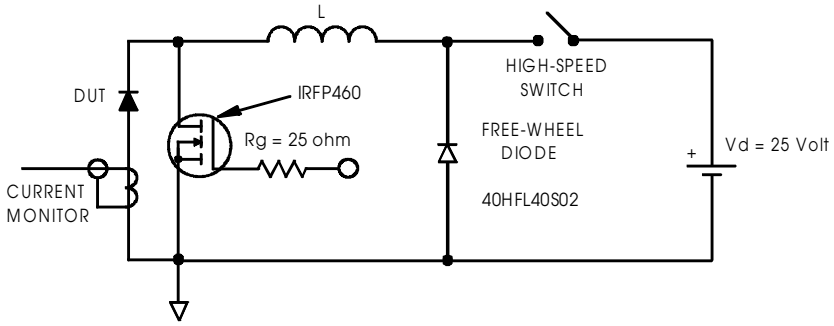
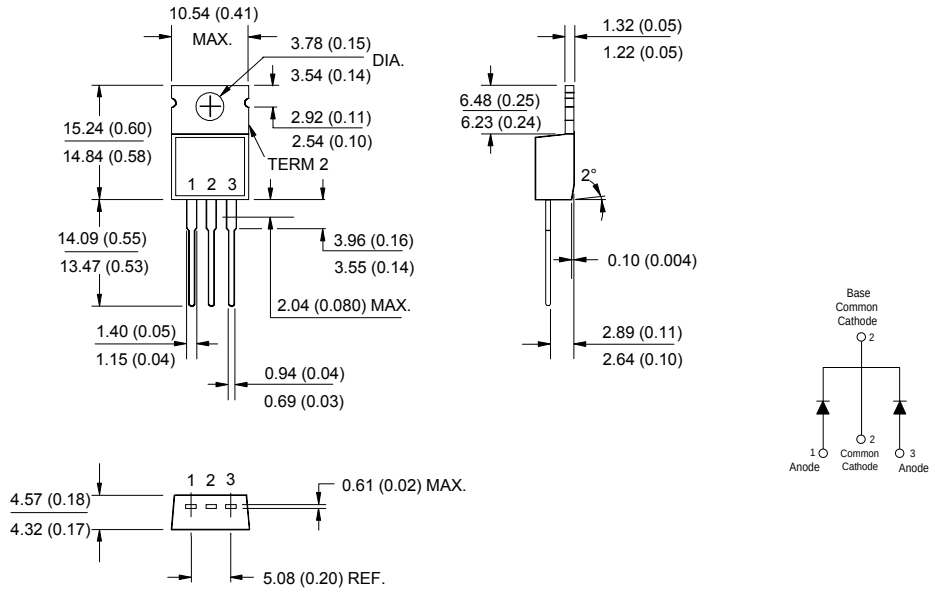


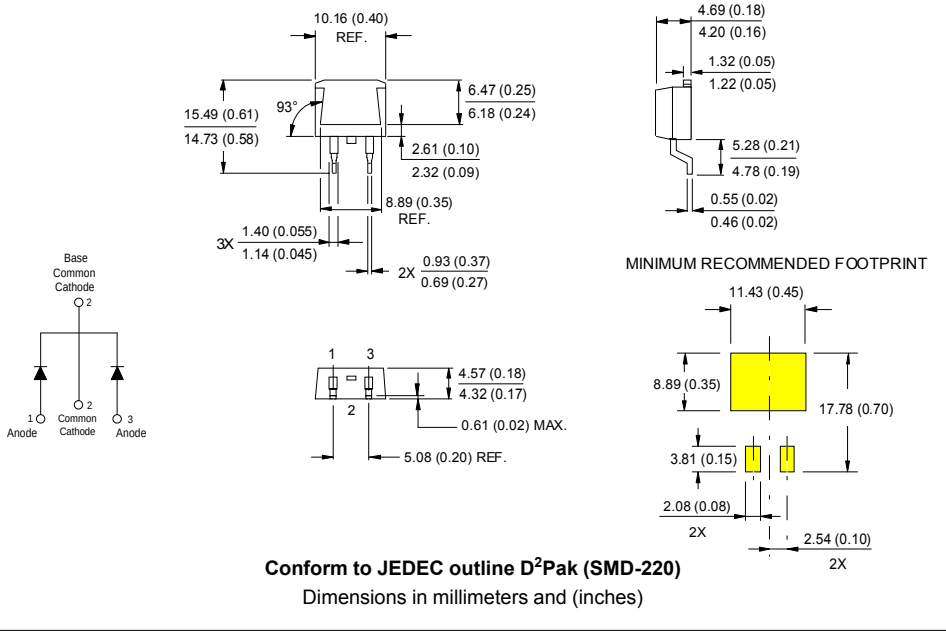
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table

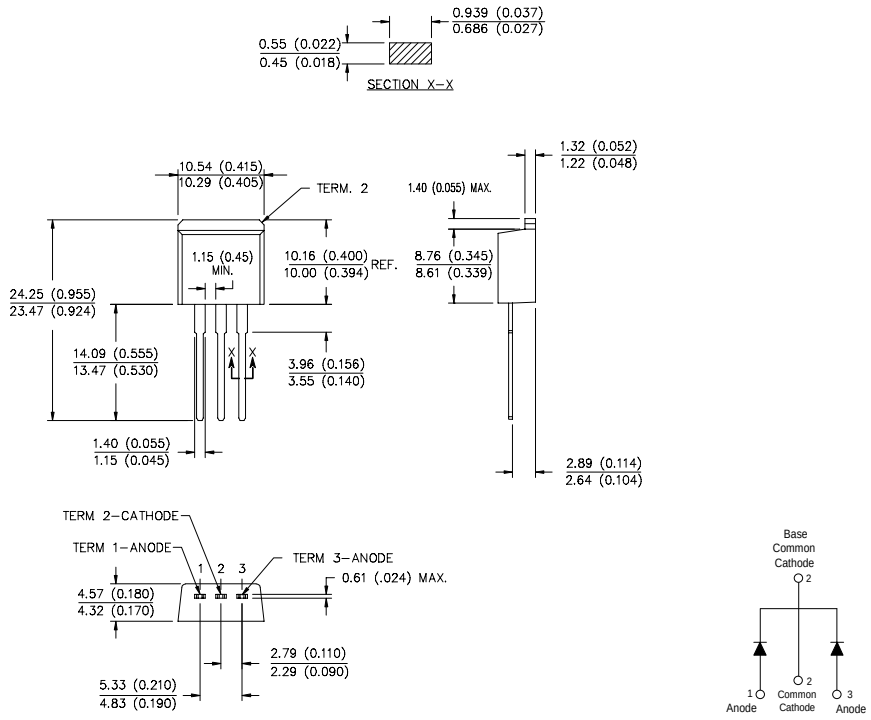


Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)



Conform to JEDEC outline D^2Pak (SMD-220)
Dimensions in millimeters and (inches)

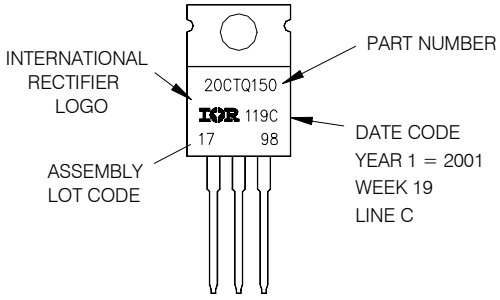
Outline Table



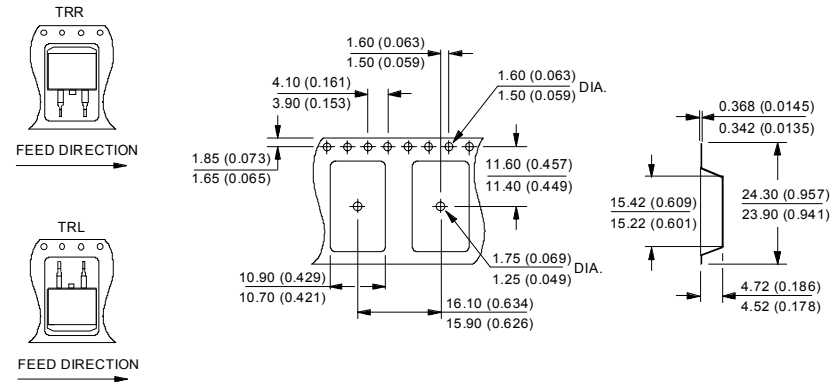
Modified JEDEC outline TO-262
Dimensions in millimeters and (inches)

Marking Information

EXAMPLE: THIS IS A 20CTQ150
LOT CODE 1798
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"



Tape & Reel Information

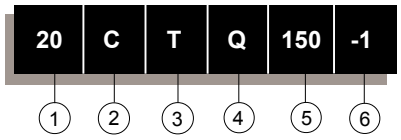


SMD-220 Tape & Reel
When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code



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 = D^2Pak

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

International
IOR Rectifier

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