Bulletin PD-20484 04/02

International
IOR Rectifier

60CTQ150

SCHOTTKY RECTIFIER

60 Amp

Major Ratings and Characteristics

Characteristics	60CTQ150	Units
$I_{F(AV)}$ Rectangular waveform	60	A
V_{RRM}	150	V
I_{FSM} @tp = 5 µs sine	710	A
V_F @30 Apk, T_J = 125°C typical (per leg)	0.69	V
T_J range	-55 to 175	°C

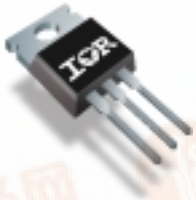
Description/ Features

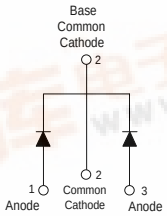
The 60CTQ150 center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- Center tap TO-220 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

60CTQ150





TO-220

Voltage Ratings

	Part number	60CTQ150
V_R	Max. DC Reverse Voltage (V)	150
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	60CTQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward (Per Leg)	30	A	50% duty cycle @ T_C = 137°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	60			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	710	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	270		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	0.4	mJ	T_J = 25 °C, I_{AS} = 0.9 Amps, L = 1 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	0.9	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)	0.83	0.88	V	@ 30A	T_J = 25 °C
	(Per Leg) * See Fig. 1	0.98	1.09	V	@ 60A	
		0.67	0.72	V	@ 30A	T_J = 125 °C
		0.82	0.87	V	@ 60A	
I_{RM}	Max. Reverse Leakage Current	7	75	µA	T_J = 25 °C	V_R = rated V_R
	(Per Leg) * See Fig. 2	7.2	20	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance (Per Leg)	-	650	pF	V_R = 5V_{DC} (test signal range 100kHz to 1Mhz) @ 25°C	
L_S	Typical Series Inductance (Per Leg)	-	7.5	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		60CTQ	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) * See Fig. 4		1.2	°C/W	DC operation
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		0.6	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.25	°C/W	Mounting surface , smooth and greased
wt	Approximate Weight		6 (0.21)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		

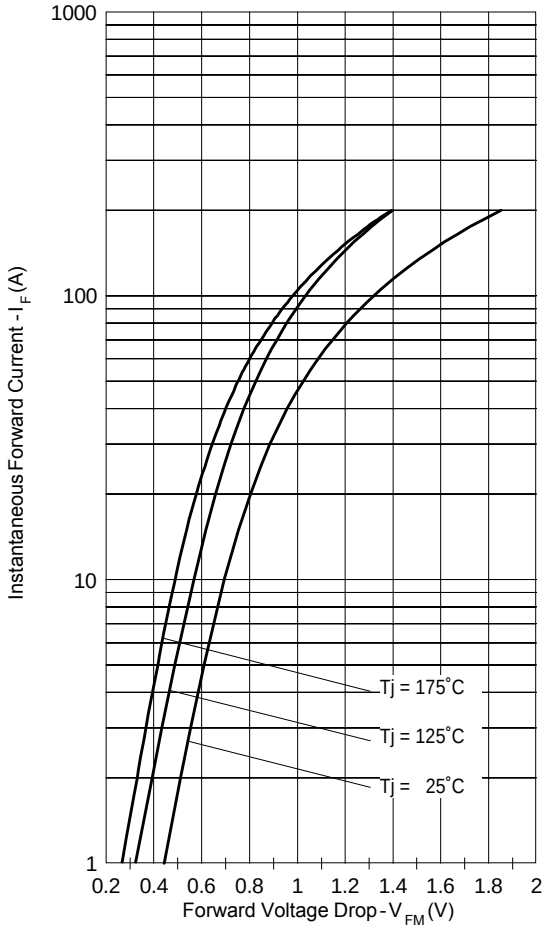


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

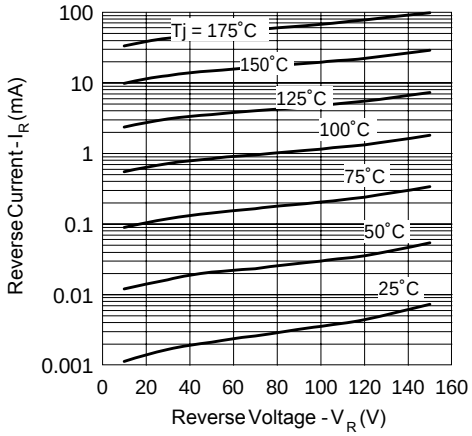


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

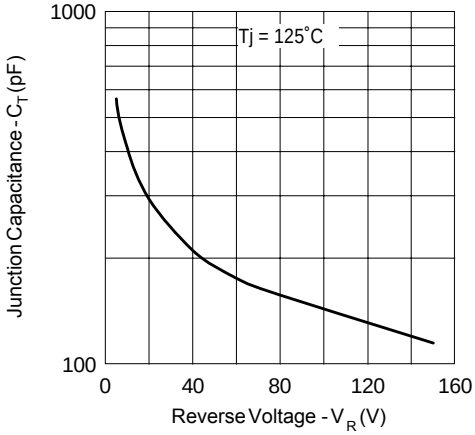


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

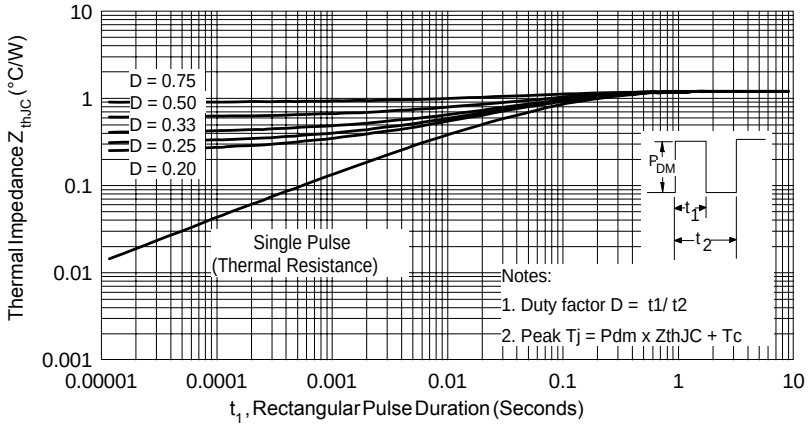


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

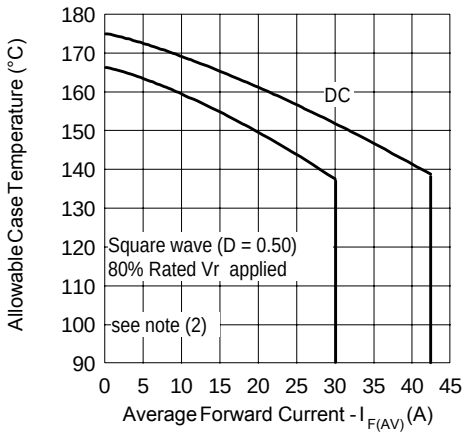


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

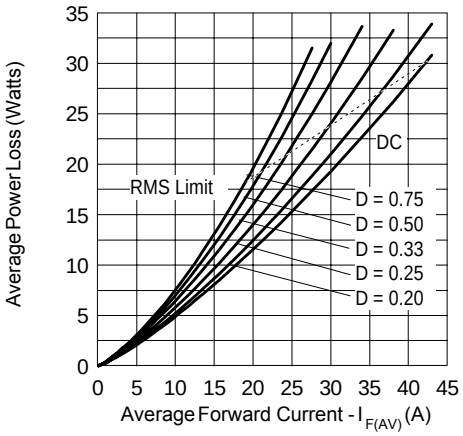


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

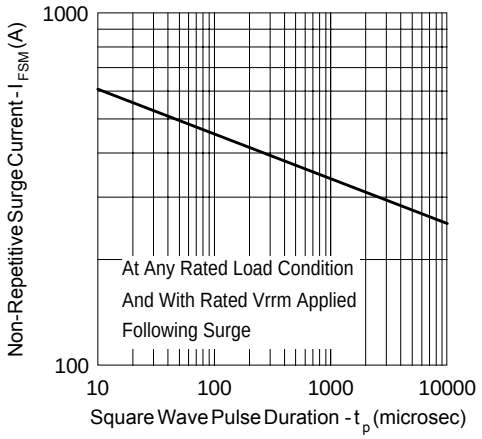


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

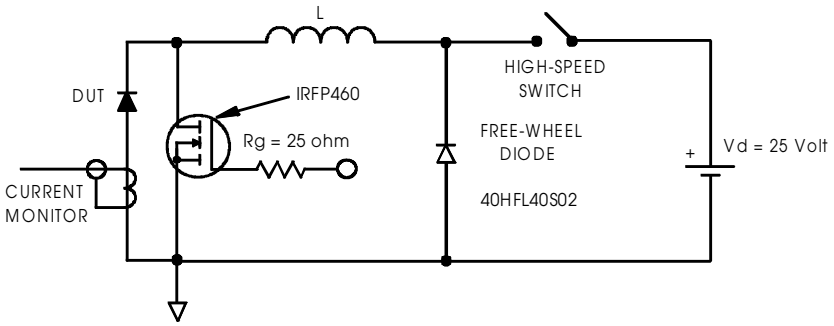
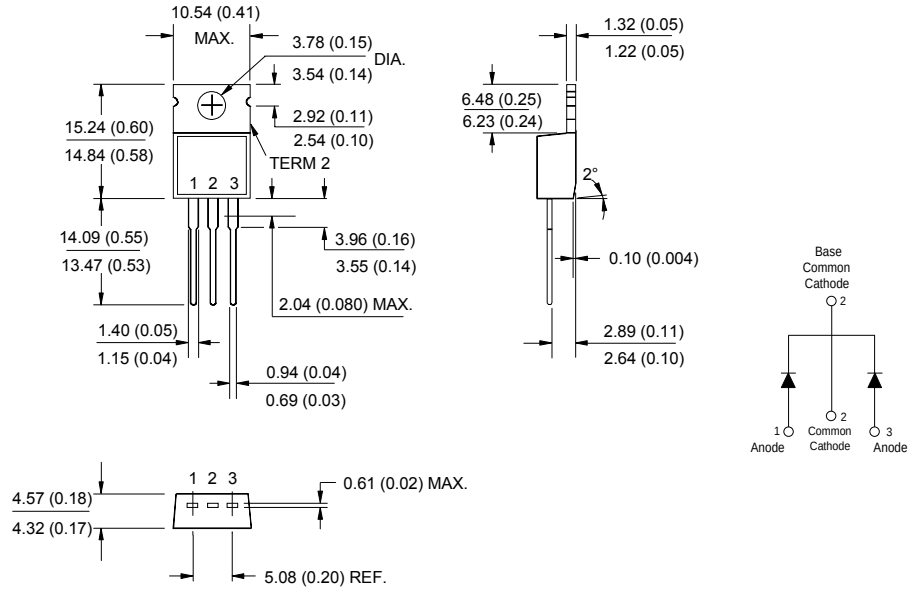


Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
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

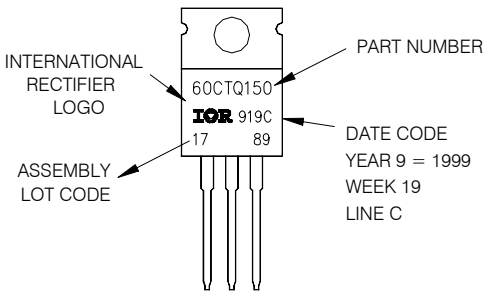
Outline Table



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

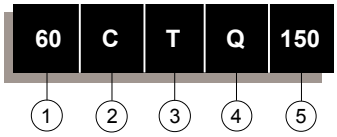
Marking Information

EXAMPLE: THIS IS A 60CTQ150
LOT CODE 1789
ASSEMBLED ON WW 19, 1999
IN THE ASSEMBLY LINE "C"



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

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.

International
IOR Rectifier

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