

International IOR Rectifier

48CTQ060 48CTQ060S 48CTQ060-1

SCHOTTKY RECTIFIER

40 Amp

$$I_{F(AV)} = 40\text{Amp}$$

$$V_R = 60\text{V}$$

Major Ratings and Characteristics




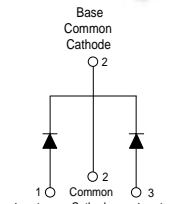
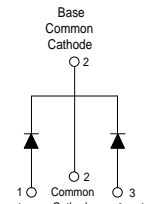
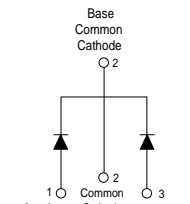
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	60	V
I_{FSM} @ tp = 5 μ s sine	1000	A
V_F @ 20 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.58	V
T_J range	-55 to 150	$^\circ\text{C}$

Description/Features

This 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 150°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° 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

48CTQ060	48CTQ060S	48CTQ060-1
		
<p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-220</p>	<p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>D²PAK</p>	<p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-262</p>

Voltage Ratings

Parameters	48CTQ060 48CTQ060S 48CTQ060-1
V_R Max. DC Reverse Voltage (V)	60
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)	20	A	50% duty cycle @ $T_C = 111^\circ\text{C}$, rectangular wave form
	40		
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1000	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
	260		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	13	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1.50$ Amps, $L = 11.5$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	1.50	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)	0.61	V	@ 20A $T_J = 25^\circ\text{C}$
	0.83	V	@ 40A
	0.58	V	@ 20A $T_J = 125^\circ\text{C}$
	0.75	V	@ 40A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	2	mA	$T_J = 25^\circ\text{C}$
	89	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.37	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	8.26	m Ω	
C_T Max. Junction Capacitance (Per Leg)	1220	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	Values	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	2.0	$^\circ\text{C/W}$	DC operation
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.0	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C/W}$	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)	

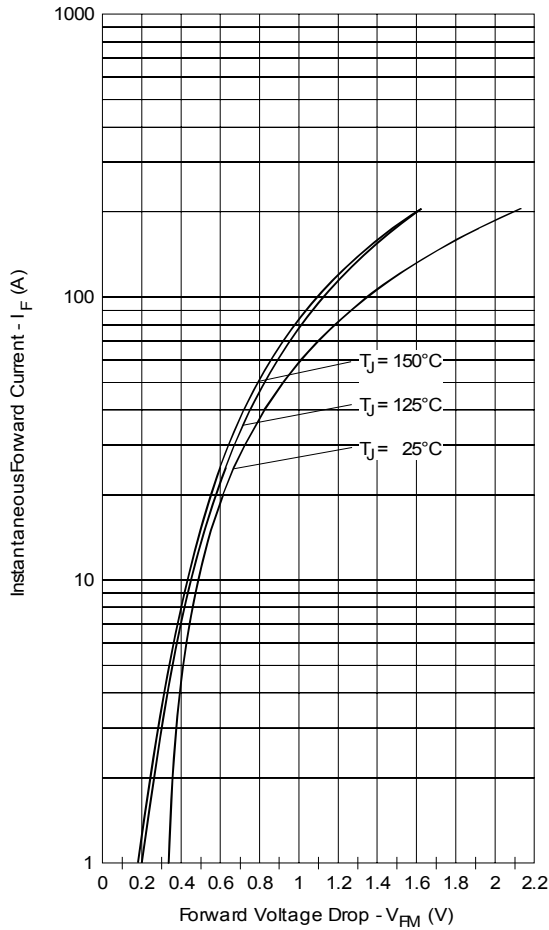


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

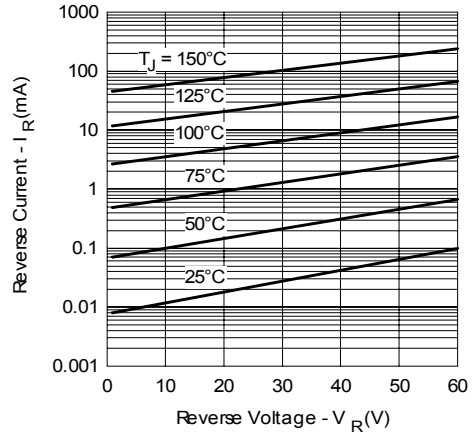


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

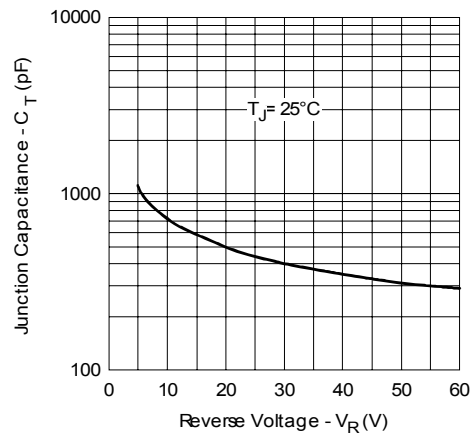


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

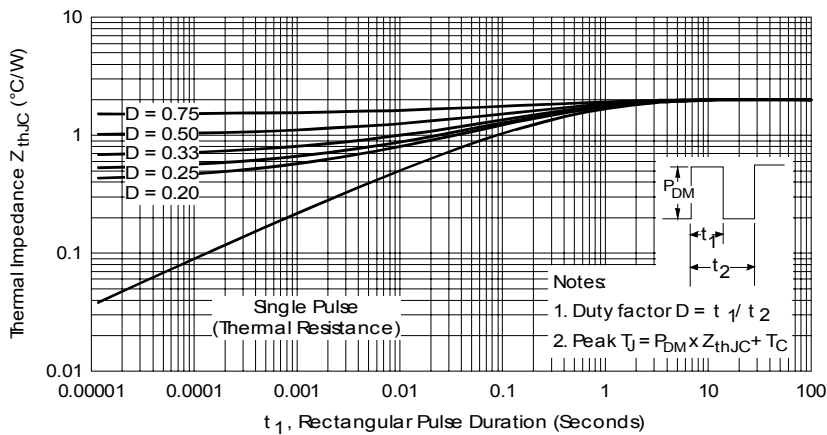


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

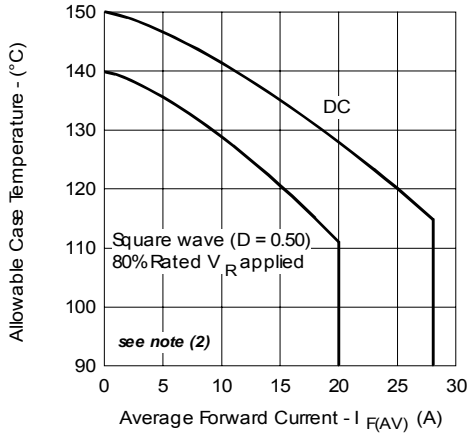


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

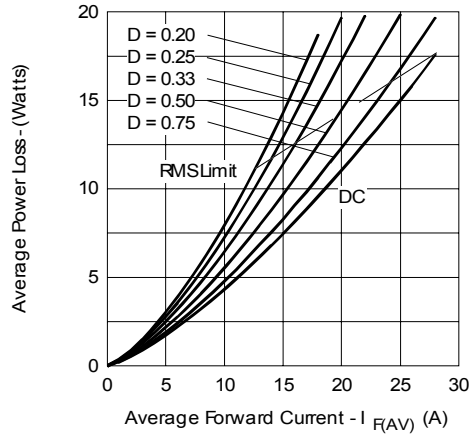


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

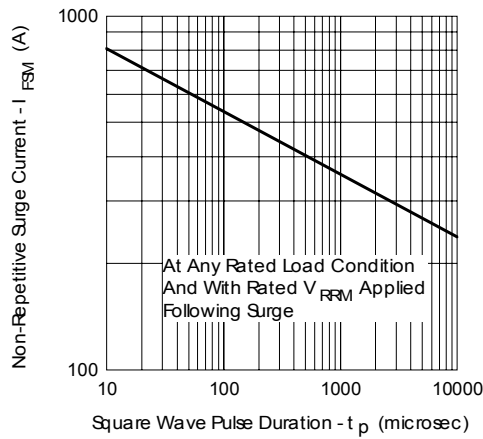


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

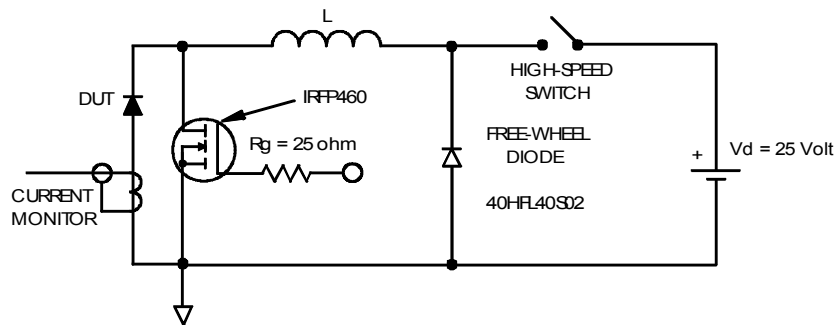
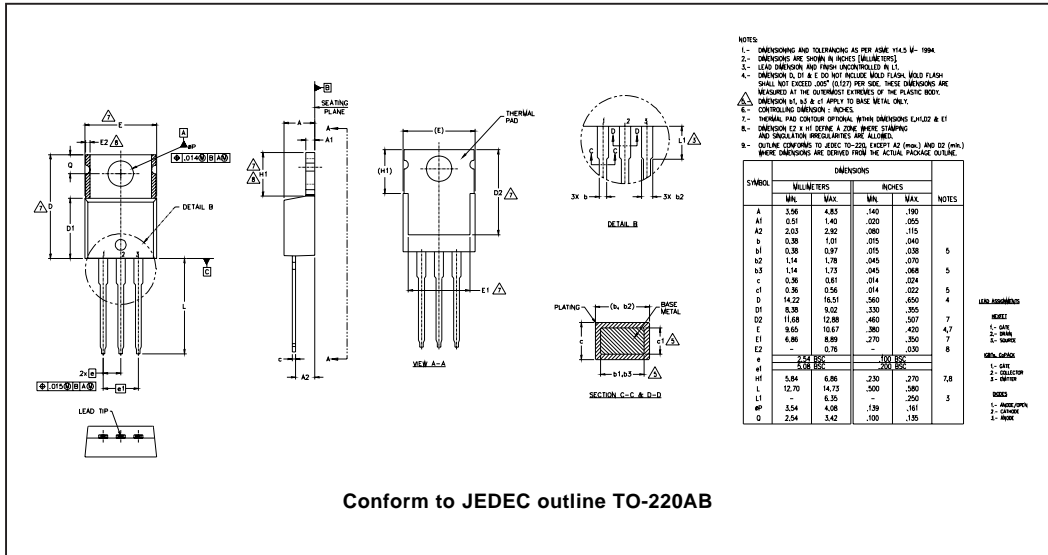


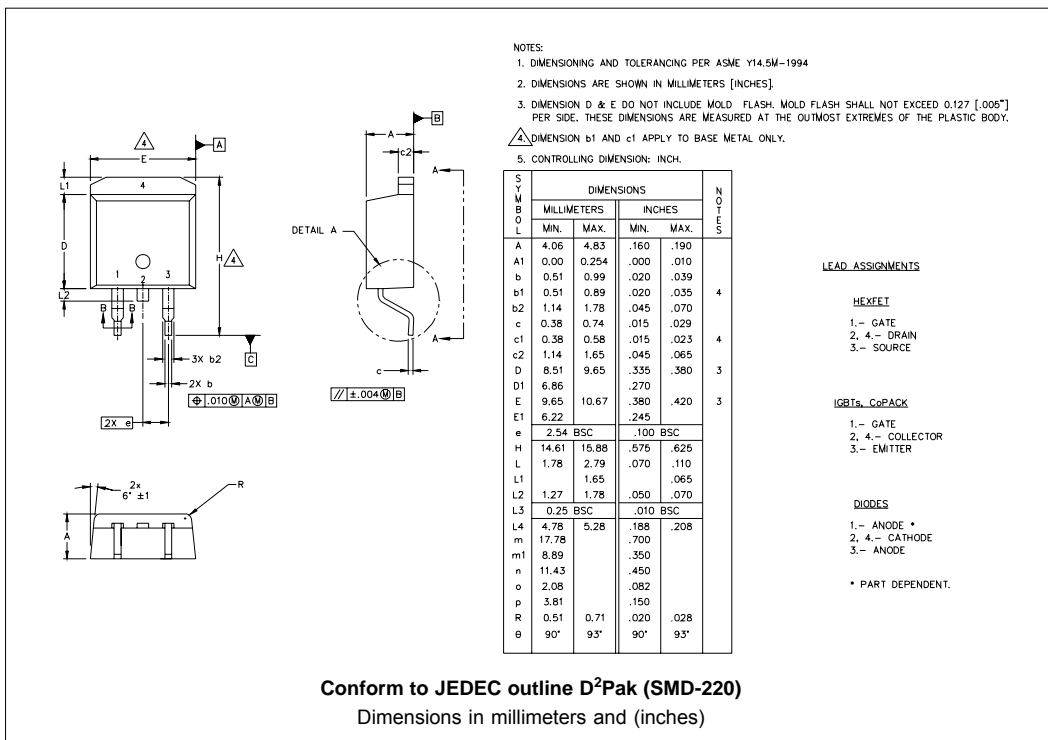
Fig. 8 - Unclamped Inductive Test Circuit

- (2) Formula used: $T_c = T_j - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 10 \text{ V}$

Outline Table

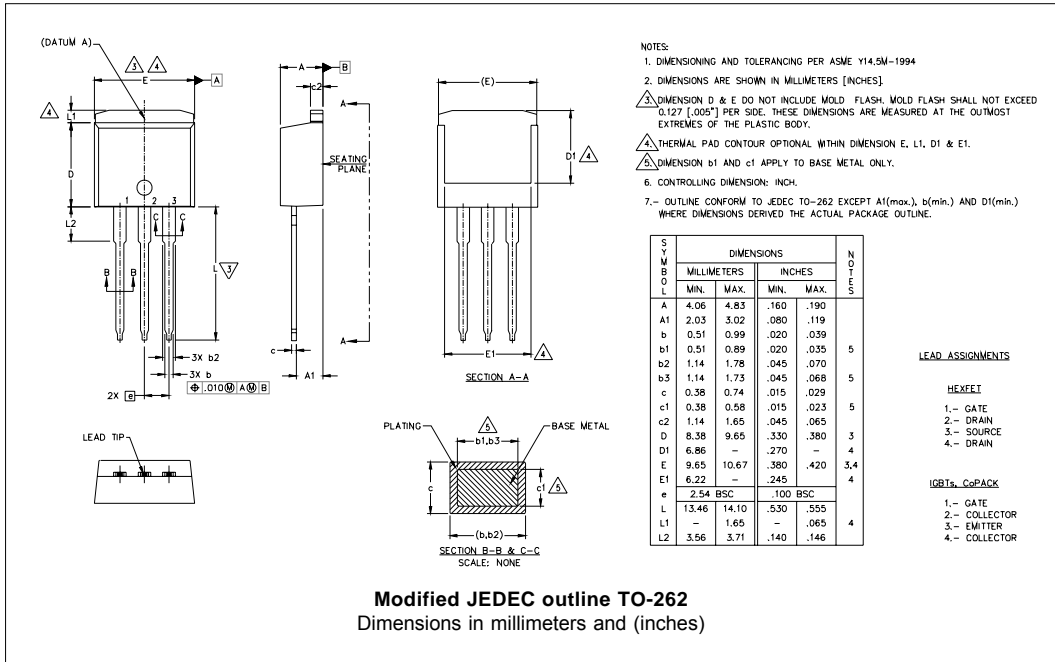


Conform to JEDEC outline TO-220AB

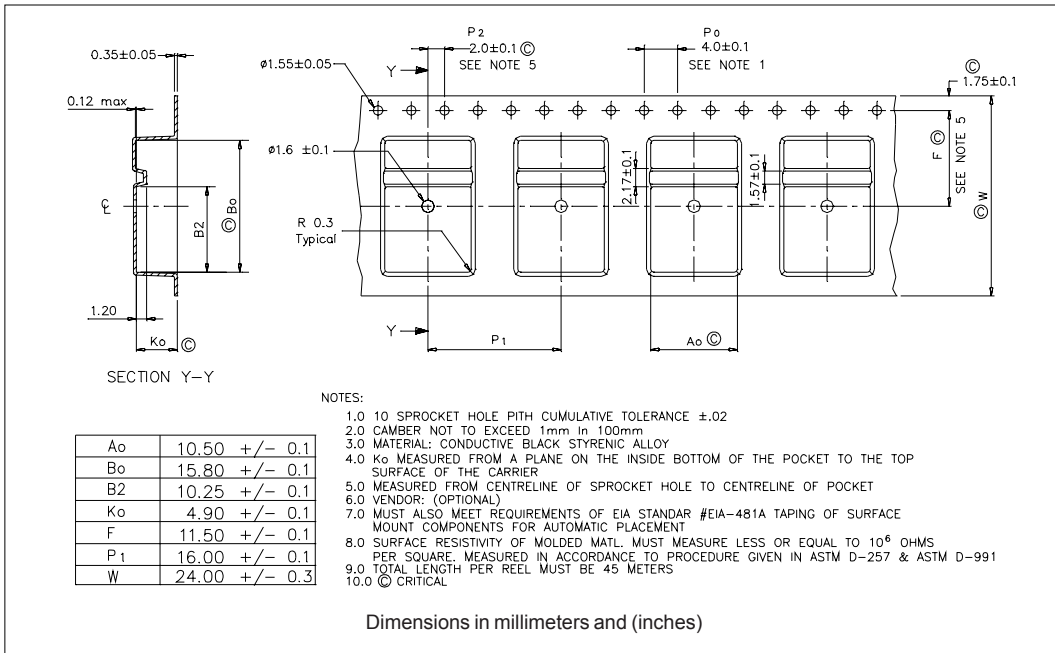


Conform to JEDEC outline D²Pak (SMD-220)
Dimensions in millimeters and (inches)

Outline Table



Tape & Reel Information



Part Marking Information

<p>TO-220</p>	<p>EXAMPLE: THIS IS A 48CTQ060 LOT CODE 1789 ASSEMBLED ON WW 19, 2000 IN THE ASSEMBLY LINE "C"</p>		<p>DATE CODE YEAR 0 = 2000 WEEK 19 LINE C</p>
<p>D²PAK</p>	<p>EXAMPLE: THIS IS A 48CTQ060S LOT CODE 8024 ASSEMBLED ON WW 02, 2003 IN ASSEMBLY LINE "C"</p>		<p>DATE CODE YEAR 3 = 2003 WEEK 02 LINE C</p>
<p>TO-262</p>	<p>EXAMPLE: THIS IS A 48CTQ060-1 LOT CODE 1789 ASSEMBLED ON WW 19, 2002 IN ASSEMBLY LINE "C"</p>		<p>DATE CODE YEAR 2 = 2002 WEEK 19 LINE C</p>

Ordering Information Table

Device Code	
48	C
T	Q
060	S
TRL	-
①	②
③	④
⑤	⑥
⑦	⑧

1	-	Current Rating (40A)
2	-	Circuit Configuration C = Common Cathode
3	-	T = TO-220
4	-	Schottky "Q" Series
5	-	Voltage Rating (060 = 60V)
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.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

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