

International
IR Rectifier

30CTQ...SPbF
30CTQ...-1PbF

SCHOTTKY RECTIFIER

30 Amp

$$I_{F(AV)} = 30\text{Amp}$$

$$V_R = 50 - 60\text{V}$$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	30	A
V_{RRM}	50 - 60	V
I_{FSM} @ tp = 5 μ s sine	1000	A
V_F @ 15 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.56	V
T_J range	-55 to 150	$^\circ\text{C}$

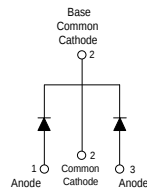
Description/ Features

This center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. 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
- Very 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)

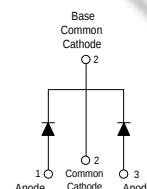
Case Styles

30CTQ...SPbF



D²PAK

30CTQ...-1PbF



TO-262

Voltage Ratings

Parameters	30CTQ050SPbF 30CTQ050-1PbF	30CTQ060SPbF 30CTQ060-1PbF
V_R Max. DC Reverse Voltage (V)	50	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)	15	A	50% duty cycle @ $T_C = 105^\circ\text{C}$, rectangular wave form
	30		
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)	0.62	V	@ 15A $T_J = 25^\circ\text{C}$
	0.82	V	@ 30A
	0.56	V	@ 15A $T_J = 125^\circ\text{C}$
	0.71	V	@ 30A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.80	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	45	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.39	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	8.47	m Ω	
C_T Max. Junction Capacitance (Per Leg)	720	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 < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters		Values	Units	Conditions
T _J	Max. Junction Temperature Range	-55 to 150	°C	
T _{stg}	Max. Storage Temperature Range	-55 to 150	°C	
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)	3.25	°C/W	DC operation
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Package)	1.63	°C/W	DC operation
R _{thCS}	Typical Thermal Resistance, Case to Heatsink	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		30CTQ...S		Case style D ² Pak
		30CTQ...-1		Case style TO-262

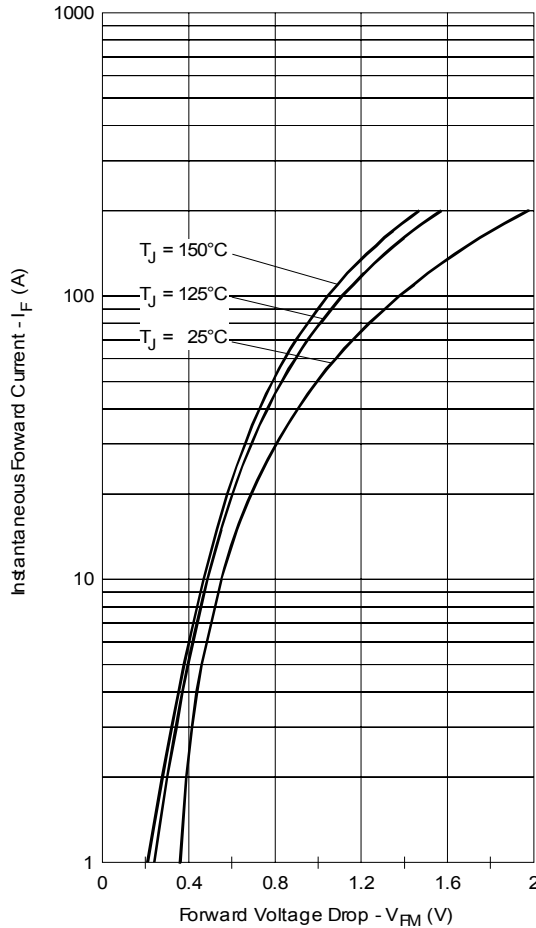


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

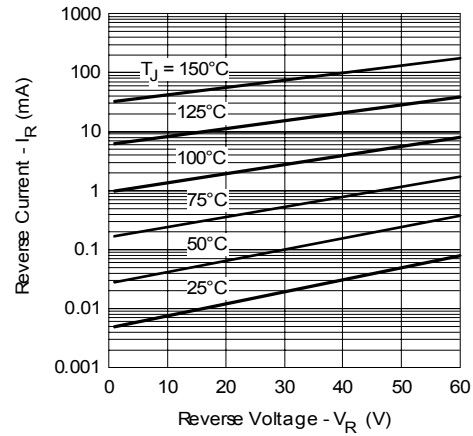


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

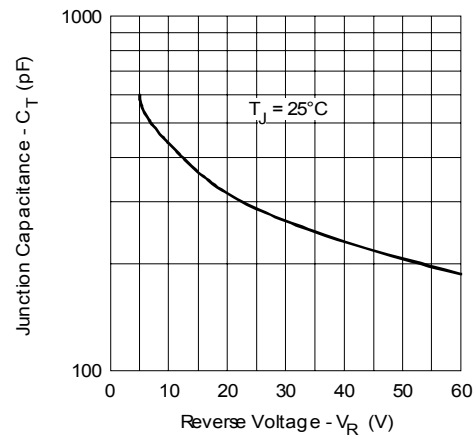


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

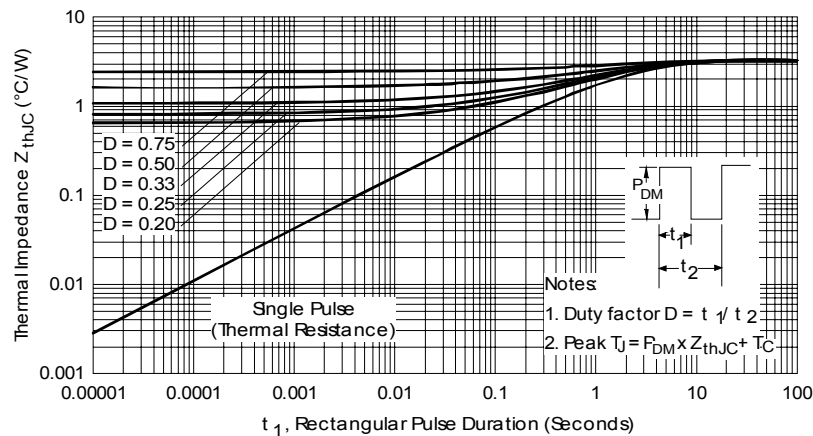


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

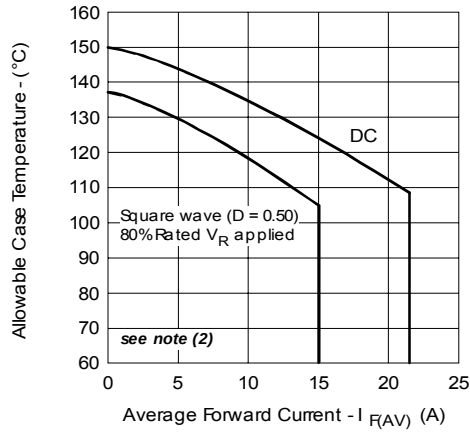


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

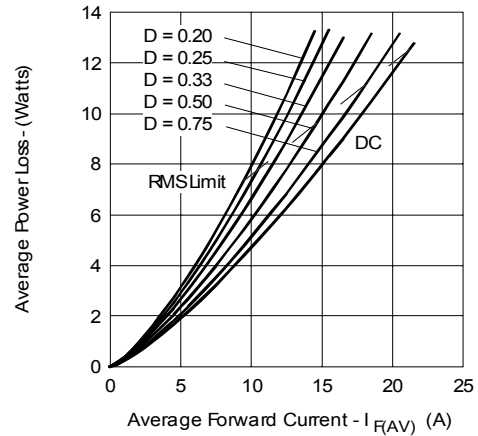


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

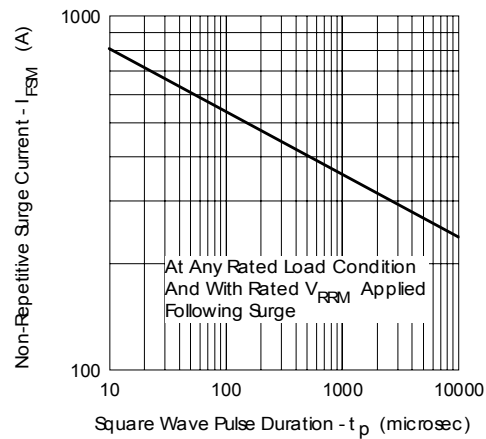


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

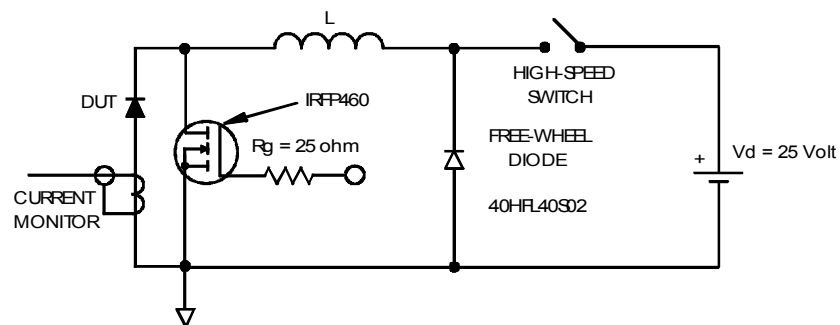


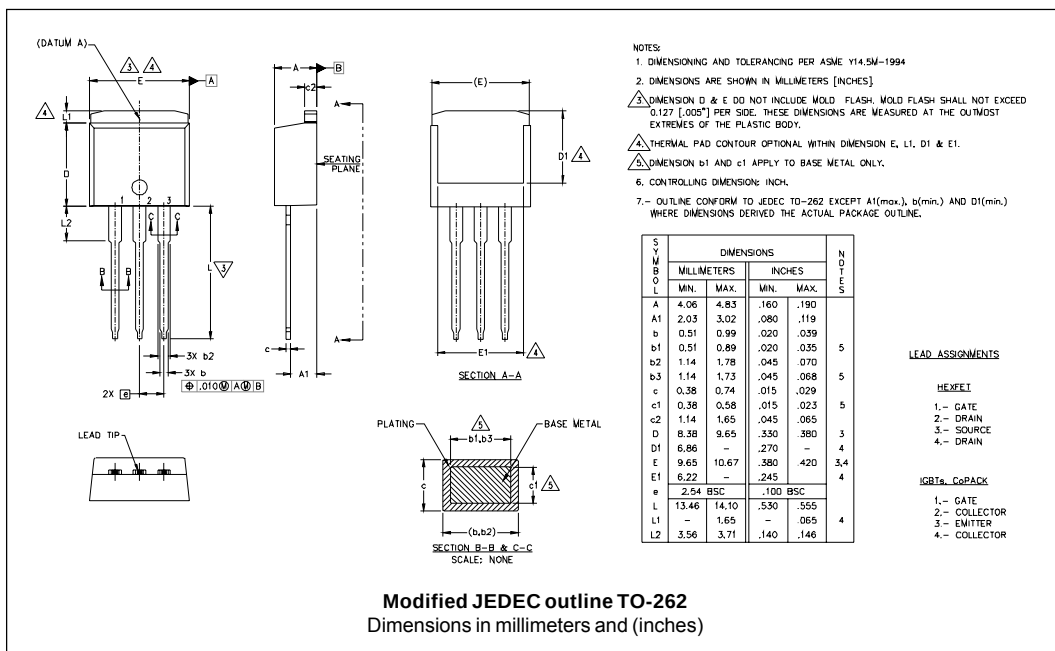
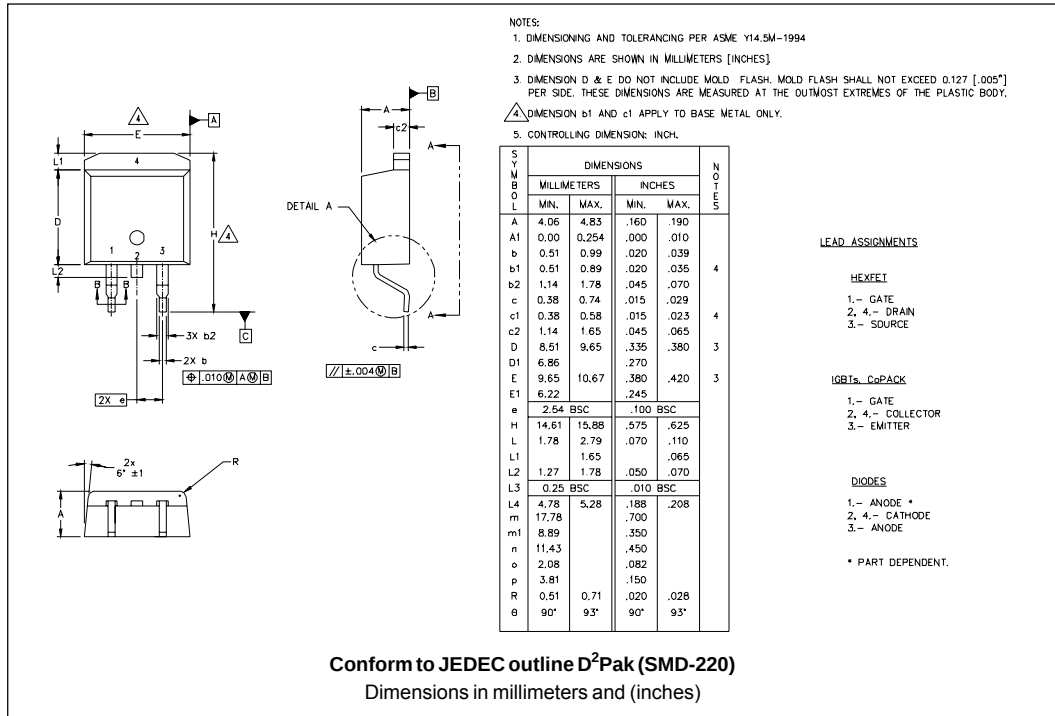
Fig. 8 - Unclamped Inductive Test Circuit

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

Outlines Table



D²PAK

EXAMPLE: THIS IS A 30CTQ060S
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

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

Diagram of a D²PAK package. The package is a small, rectangular, surface-mount component with two leads. The top surface is marked with the following information:

- INTERNATIONAL RECTIFIER LOGO**: A stylized "IR" logo.
- PART NUMBER**: 30CTQ060S
- DATE CODE**: 002P
- ASSEMBLY LOT CODE**: 80 24

Legend:
YEAR 0 = 2000
WEEK 02
P = LEAD-FREE

TO-262

EXAMPLE: THIS IS A 430CTQ060-1
LOT CODE 1789
ASSEMBLED ON WW 19, 1999

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

Diagram of a TO-262 package. The package is a small, rectangular, surface-mount component with four leads. The top surface is marked with the following information:

- INTERNATIONAL RECTIFIER LOGO**: A stylized "IR" logo.
- PART NUMBER**: 430CTQ060-1
- DATE CODE**: 919P
- ASSEMBLY LOT CODE**: 17 89

Legend:
YEAR 9 = 1999
WEEK 19
P = LEAD-FREE

0.35±0.05

0.12 max

1.6

B2

1.20

K0

SECTION Y-Y

Ø1.55±0.05

Ø1.6 ±0.1

R 0.3 Typical

P2 2.0±0.1 SEE NOTE 5

P0 4.0±0.1 SEE NOTE 1

2.17±0.1

1.57±0.1

F

W

P1

A0

1.75±0.1

SEE NOTE 5

NOTES:

- 1.0 10 SPROCKET HOLE PITH CUMULATIVE TOLERANCE ±.02
- 2.0 CAMBER NOT TO EXCEED 1mm IN 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENIC ALLOY
- 4.0 K0 MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
- 5.0 MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF POCKET
- 6.0 VENDOR: (OPTIONAL)
- 7.0 MUST ALSO MEET REQUIREMENTS OF EIA STANDARD #EIA-481A TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT
- 8.0 SURFACE RESISTIVITY OF MOLDED MATL. MUST MEASURE LESS OR EQUAL TO 10⁶ OHMS PER SQUARE. MEASURED IN ACCORDANCE TO PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991
- 9.0 TOTAL LENGTH PER REEL MUST BE 45 METERS
- 10.0 Ⓢ CRITICAL

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code							
	30	C	T	Q	060	S	TRL PbF
	1	2	3	4	5	6	7 8
1	-	Current Rating (30A)					
2	-	Circuit Configuration					
		C = Common Cathode					
3	-	T = TO-220					
4	-	Schottky "Q" Series					
5	-	Voltage Ratings					
6	-	- S = D²Pak -1 = TO-262					
7	-	- none = Tube (50 pieces) - TRL = Tape & Reel (Left Oriented - for D²Pak only) - TRR = Tape & Reel (Right Oriented - for D²Pak only)					
8	-	- none = Standard Production - PbF = Lead-Free					

050 = 50V
 060 = 60V

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.