

International
IR Rectifier

30CTQ...PbF Series

SCHOTTKY RECTIFIER

30 Amp

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

$$V_R = 35/45\text{V}$$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	30	A
V_{RRM}	35/45	V
I_{FSM} @ tp = 5 μ s sine	1060	A
V_F @ 15 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.56	V
T_J	-55 to 175	$^\circ\text{C}$

Description/ Features

The 30CTQ...PbF 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 175 $^\circ\text{C}$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

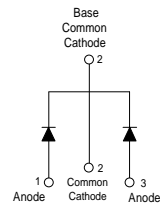
- 175 $^\circ\text{C}$ T_J operation
- Center tap TO-220 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles

30CTQ...PbF



TO-220



Voltage Ratings

Part number	30CTQ035PbF	30CTQ040PbF	30CTQ045PbF
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	30CTQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	30	A	50% duty cycle @ $T_C = 127^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1060	A	Following any rated load condition and with rated V_{RWM} applied
	265		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	20	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 3.0$ Amps, $L = 4.40$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	3.0	A	Current decaying linearly to zero in $1\ \mu\text{sec}$ Frequency limited by T_J , max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	30CTQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.62	V	@ 15A
	0.76	V	@ 30A
	0.56	V	@ 15A
	0.70	V	@ 30A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	2	mA	$T_J = 25^\circ\text{C}$
	15	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	900	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)	10000	V/ μs	

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

Thermal-Mechanical Specifications

Parameters	30CTQ	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	3.25	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.63	$^\circ\text{C}/\text{W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C}/\text{W}$	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	30CTQ045		

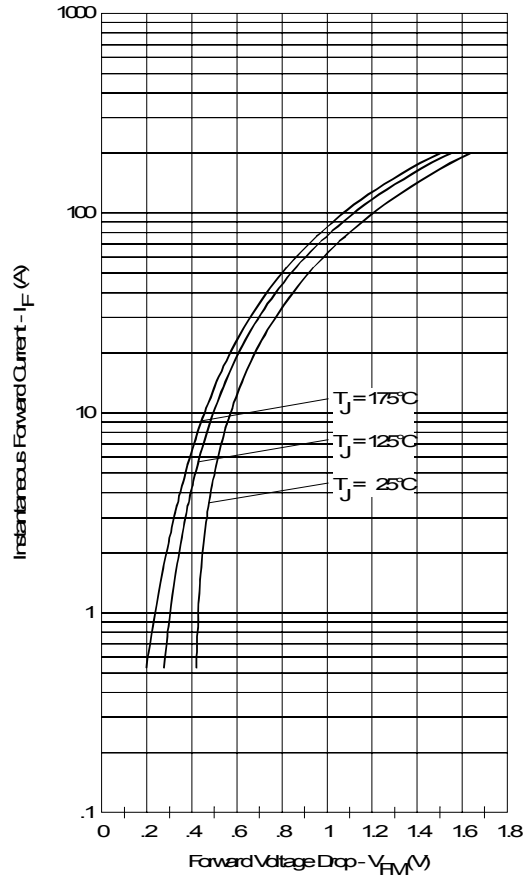


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

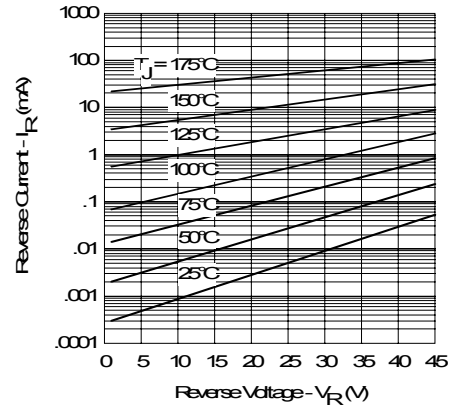


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

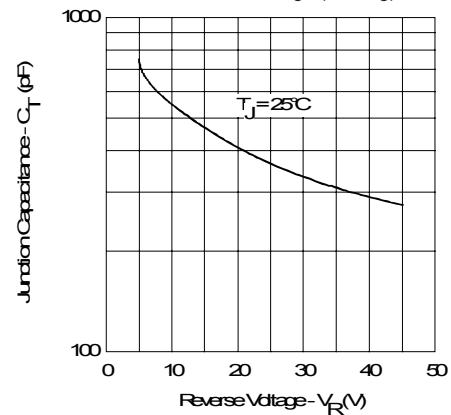


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

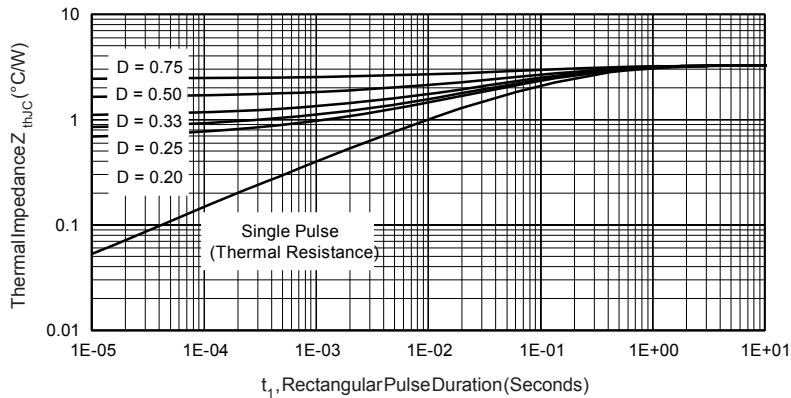


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

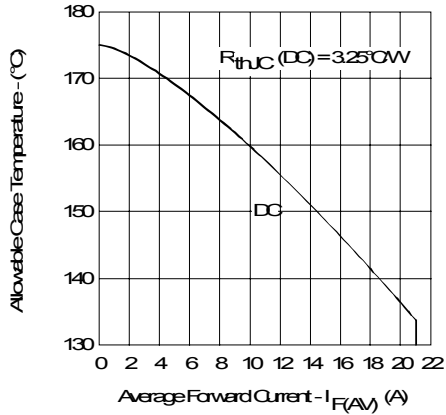


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

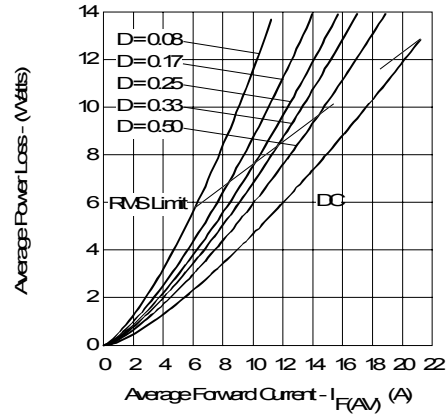


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

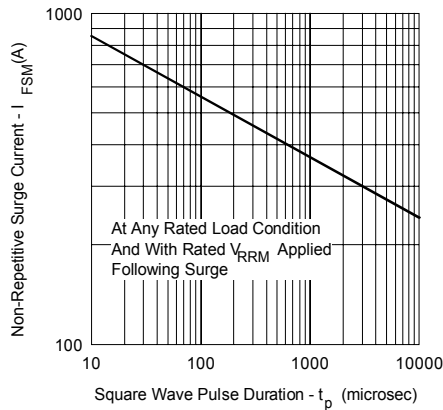


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

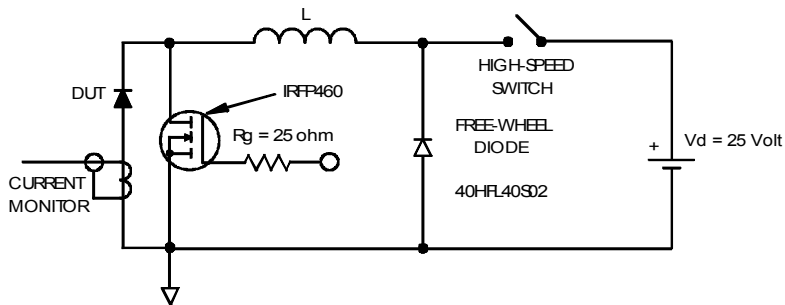


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

NOTES:

- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5 M-1994.
- DIMENSIONS ARE GIVEN IN INCHES (MILLIMETERS).
- LEAD DIMENSION AND FLASH UNCONTROLLED IN L1.
- DIMENSION D1 OR D2 DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- DIMENSION M1, M2 & M3 APPLY TO BASE METAL ONLY.
- CONTROLLING DIMENSION - INCHES.
- THERMAL PAD CONTOUR OPTIONAL. WITHIN DIMENSIONS C1/D2 & E1.
- DIMENSION E2 x H DEFINE A ZONE WHERE STAMPING AND SOLDERING IRREGULARITIES ARE ALLOWED.
- OUTLINE CONFORMS TO AEC-Q-200 EXCEPT A2 (max.) AND D2 (min.) WHERE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
A	3.56	4.63	.140	.180	
A1	0.51	1.43	.020	.055	
A2	2.03	2.92	.080	.115	
b	0.38	1.01	.015	.040	
b1	0.38	0.97	.015	.038	5
b2	1.14	1.78	.045	.070	
b3	1.14	1.72	.045	.068	
c	0.36	0.61	.014	.024	
c1	0.36	0.56	.014	.022	5
D	14.22	18.51	.560	.650	4
D1	8.58	9.02	.330	.355	
D2	11.68	12.88	.460	.507	7
E1	9.65	10.67	.380	.420	4, 7
E2	6.86	8.89	.270	.350	7
E2	-	0.76	-	.030	8
e	2.54 REF.	100 REF.	-	-	
e1	5.88 REF.	230 REF.	-	-	
H1	5.88	6.88	.230	.270	7, 8
L	12.70	14.73	.500	.580	
L1	-	6.35	-	.250	5
ap	2.54	4.08	.100	.160	
Q	2.64	3.42	.100	.135	

LEAD DIMENSIONS

- L1 - GATE
- L2 - CATHODE
- L3 - ANODE

SYMBOLS

- 1 - DIMENSION
- 2 - DIMENSION
- 3 - DIMENSION
- 4 - DIMENSION
- 5 - DIMENSION
- 6 - DIMENSION
- 7 - DIMENSION
- 8 - DIMENSION

SECTION C-C & D-D

Conform to JEDEC outline TO-220AB

Part Marking Information

IRXC Assembly Line - SubCon Assembly Line

EXAMPLE: THIS IS A 30CTQ045
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"

Note: "P" in the beginning of date code indicates "Lead-Free"

INTERNATIONAL RECTIFIER LOGO
ASSEMBLY LOT CODE
PART NUMBER
DATE CODE
P = LEAD-FREE
YEAR 1 = 2001
WEEK 19
LINE C

IRMX Assembly Line

EXAMPLE: THIS IS A 30CTQ045
LOT CODE 1789
ASSEMBLED ON WW 19, 2001

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

INTERNATIONAL RECTIFIER LOGO
ASSEMBLY LOT CODE
PART NUMBER
DATE CODE
YEAR 1 = 2001
WEEK 19
P = LEAD-FREE

Ordering Information Table

Device Code					
30	C	T	Q	045	PbF
①	②	③	④	⑤	⑥
1	- Current Rating (30 = 30A)				
2	- Circuit Configuration C = Common Cathode				
3	- Package T = TO-220				
4	- Schottky "Q" Series				
5	- Voltage Ratings				
6	- • none = Standard Production • PbF = Lead-Free				
				035 = 35V 040 = 40V 045 = 45V	
Tube Standard Pack Quantity : 50 pieces					

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.