Bulletin PD-20300 rev. B 03/03

International
IOR Rectifier

30CTQ060
30CTQ060S
30CTQ060 -1

SCHOTTKY RECTIFIER

30 Amp

$I_{F(AV)}$ = 30Amp
V_R = 50 - 60V

Major Ratings and Characteristics

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

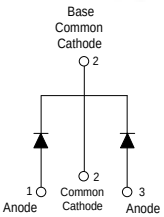
Description/ Features

This center tap Schottky rrectifier 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

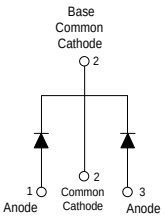
Case Styles

30CTQ...



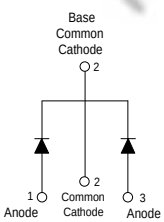
TO-220

30CTQ... S



D^2PAK

30CTQ... -1



TO-262

Voltage Ratings

	Part number	30CTQ050	30CTQ060
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)	15	A	50% duty cycle @ T_C = 105°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	30			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	1000	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	260		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	13	mJ	T_J = 25 °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 x 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 °C
		0.82	V	@ 30A	
		0.56	V	@ 15A	T_J = 125 °C
		0.71	V	@ 30A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.80	mA	T_J = 25 °C	V_R = rated V_R
		45	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.39	V	T_J = T_J max.	
r_t	Forward Slope Resistance	8.47	mΩ		
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 (Rated V_R)	10000	V/ µs		

(1) Pulse Width < 300µs, 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 (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)		

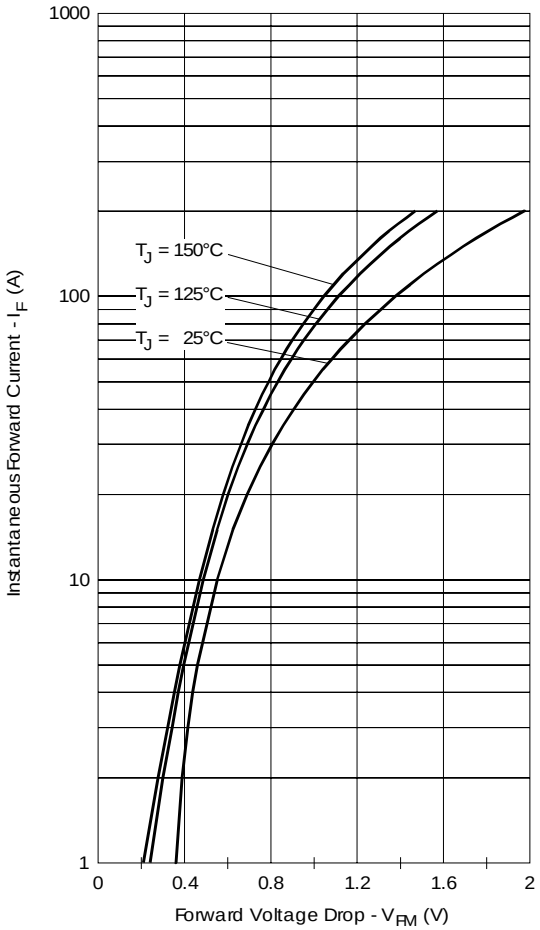


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

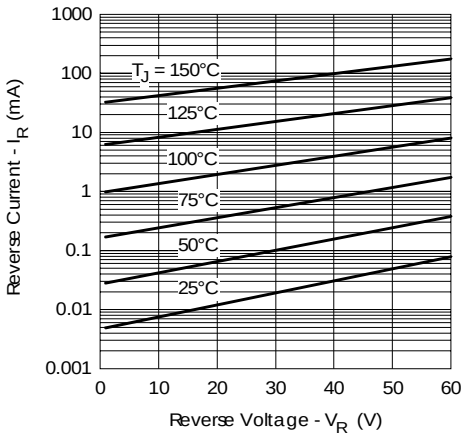


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

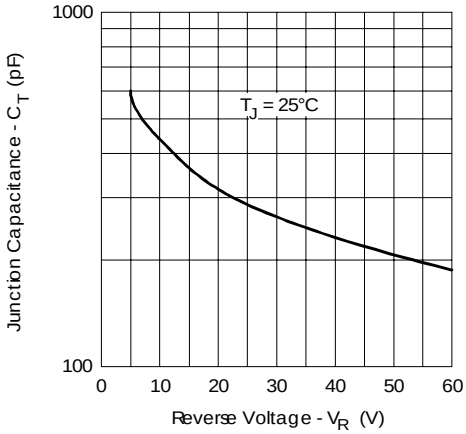


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

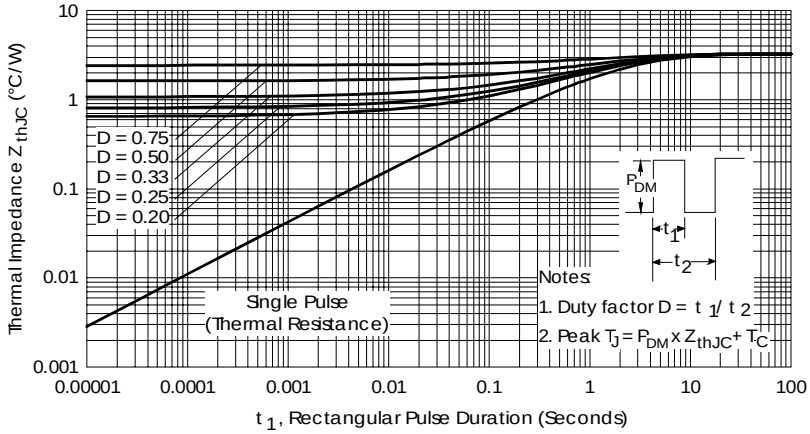


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

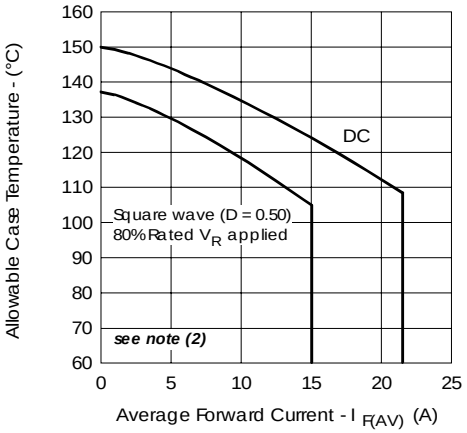


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

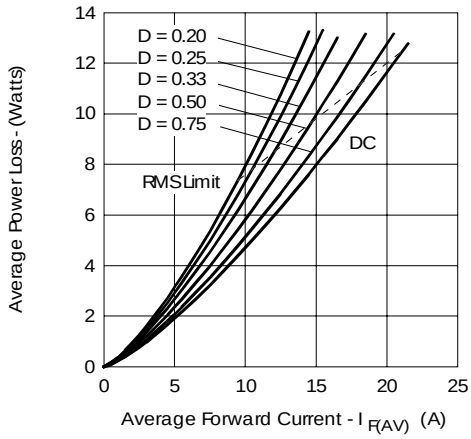


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

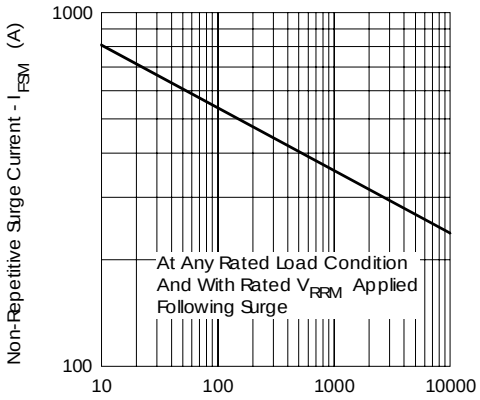


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

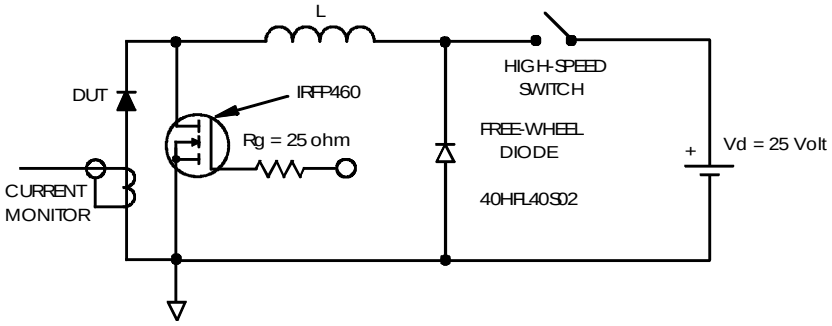
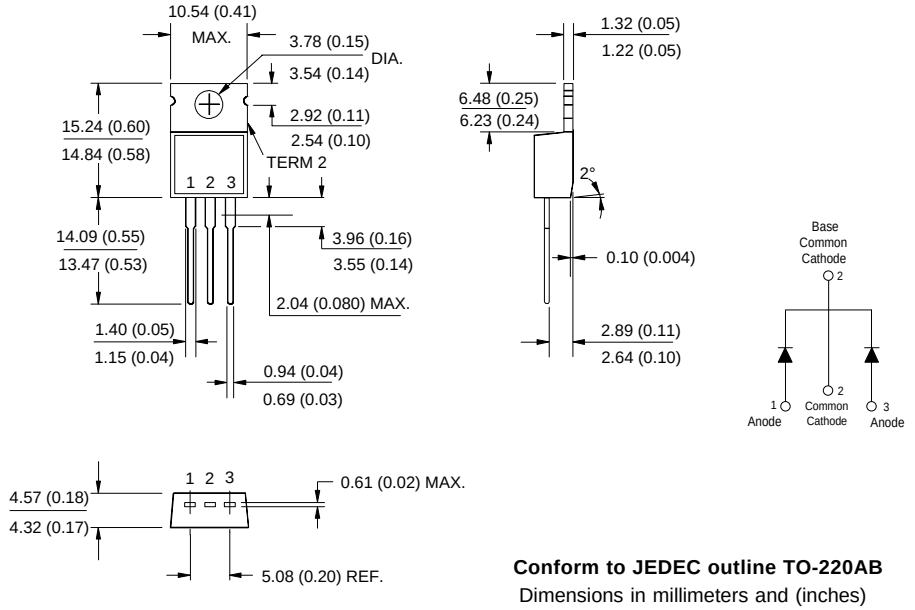


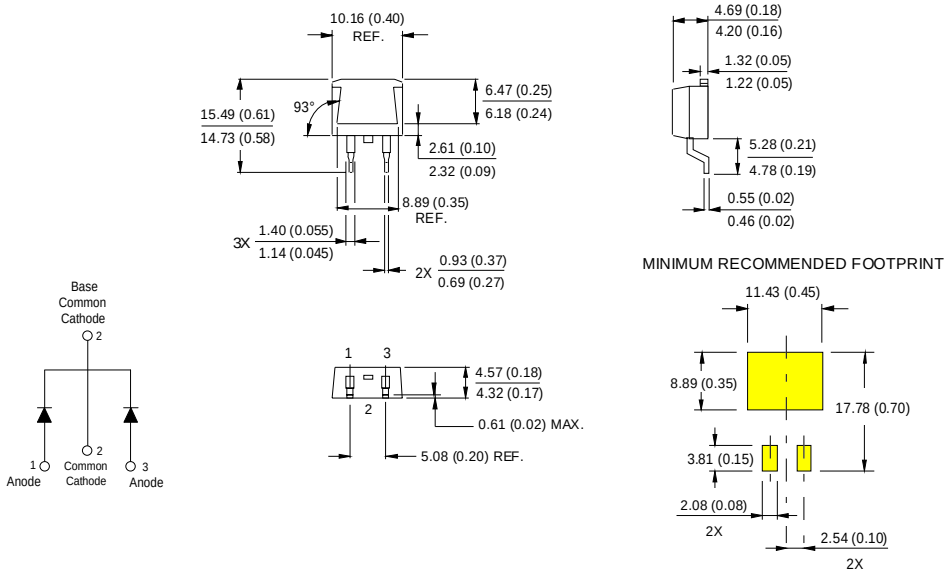
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 10$ V

Outline Table

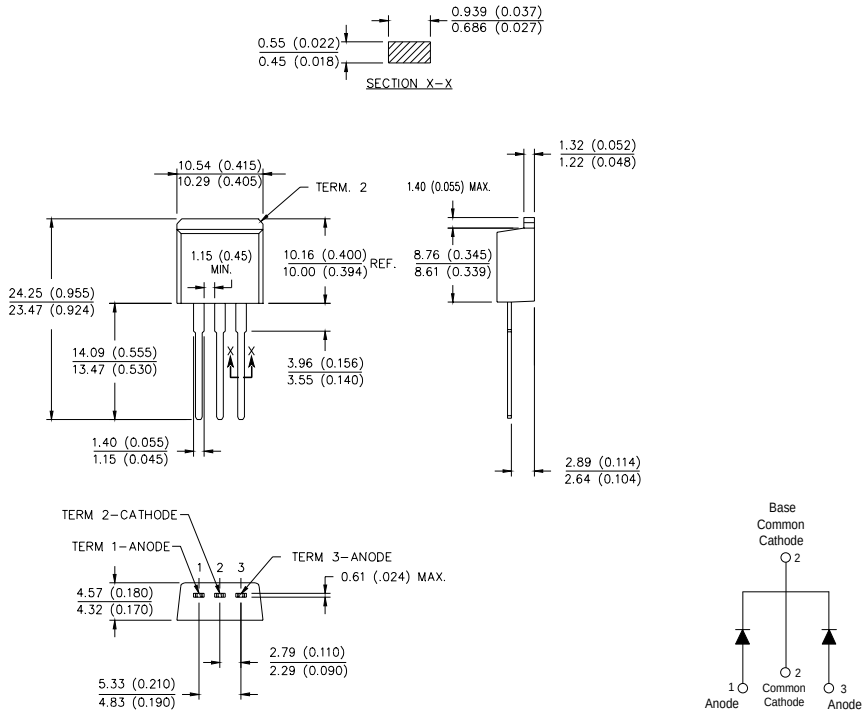


Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)



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

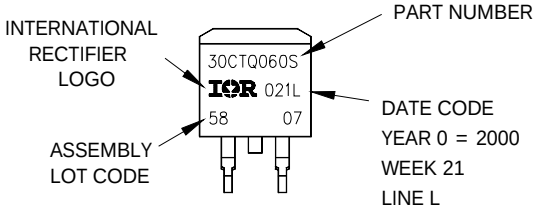
Outline Table



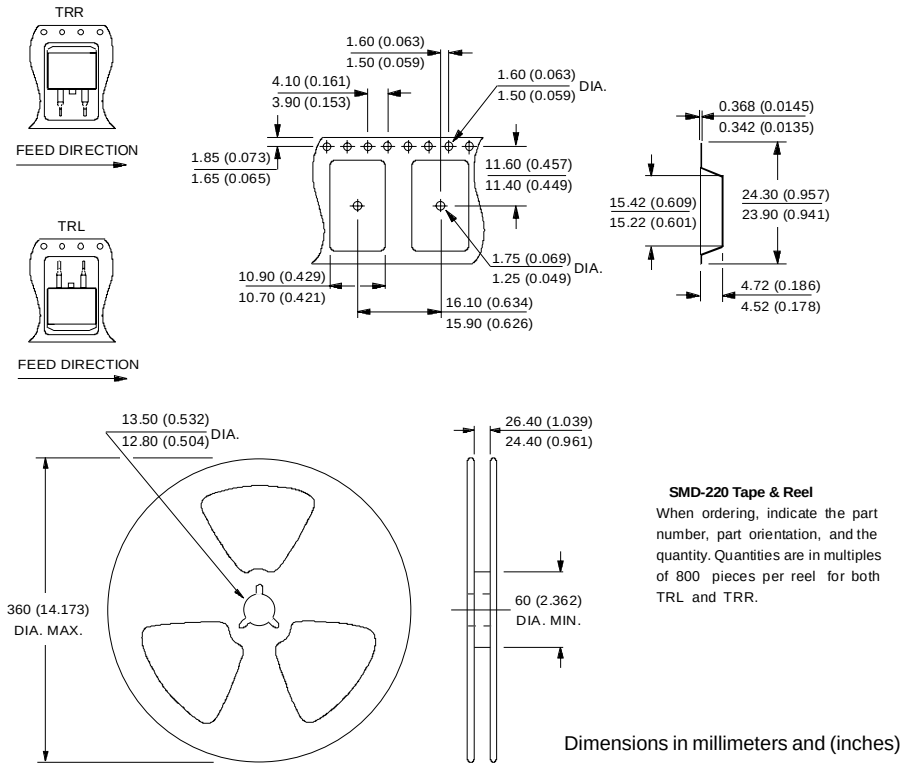
Modified JEDEC outline TO-262
Dimensions in millimeters and (inches)

Marking Information

EXAMPLE: THIS IS A 30CTQ060S WITH
LOT CODE 58 07
ASSEMBLED ON WW 21, 2000
IN THE ASSEMBLY LINE "L"



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

30	C	T	Q	060	-1
1	2	3	4	5	6

1 - Essential Part Number
2 - C = Common Cathode
3 - T = TO-220
4 - Q = Schottky Q Series
5 - Voltage Rating — 050 = 50V, 060 = 60V
6 - 1 = TO-262
S = D^2Pak

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

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 03/03