

Major Ratings and Characteristics

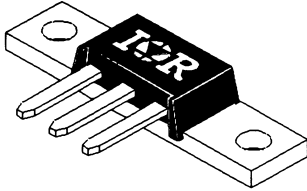
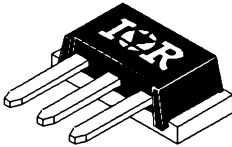
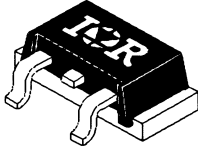
Characteristics	83CNQ...	Units
$I_{F(AV)}$ Rectangular waveform	80	A
V_{RRM} range	80 to 100	V
I_{FSM} @ $t_p = 5 \mu s$ sine	7000	A
V_F @ 40 Apk, $T_J = 125^\circ C$ (per leg)	0.67	V
T_J range	-55 to 175	$^\circ C$

Description/Features

The 83CNQ center tap Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 $^\circ C$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175 $^\circ C$ T_J operation
- Center tap module
- 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
- Low profile, small footprint, high current package

Case Styles

83CNQ...	83CNQ...SM	83CNQ...SL
		
D61-8	D61-8-SM	D61-8-SL

Voltage Ratings

Part number	83CNQ080	83CNQ100
V_R Max. DC Reverse Voltage (V)	80	100
V_{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	83CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	80	A	50% duty cycle @ $T_C = 132^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	7000	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RWM} applied
	720		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{ Amps}$, $L = 30\text{ mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	1	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	83CNQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.81	V	@ 40A $T_J = 25^\circ\text{C}$
	1.00	V	@ 80A
	0.67	V	@ 40A $T_J = 125^\circ\text{C}$
	0.82	V	@ 80A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.5	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	35	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	1400	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	5.5	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	83CNQ	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)	0.85	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.42	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink (D61-8 Only)	0.30	$^\circ\text{C/W}$	Mounting surface, smooth and greased Device flatness < 5mls
wt Approximate Weight	7.8(0.28)	g(oz.)	
T Mounting Torque	Min. 12(10) Max. 24(20)	Kg-cm (lbf-in)	(*)

(*) Recommended hardware 3M stainless screw

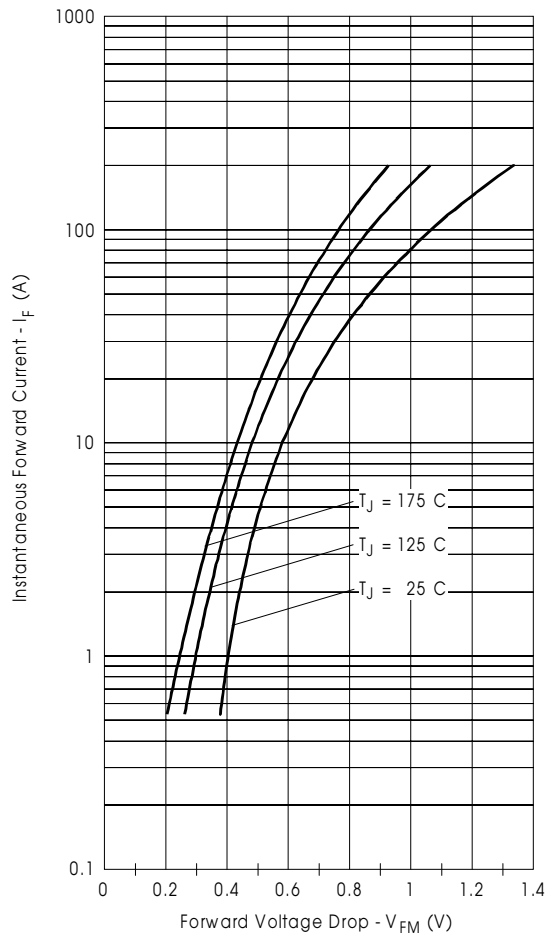


Fig. 1 - Max. Forward Voltage Drop Characteristics (PerLeg)

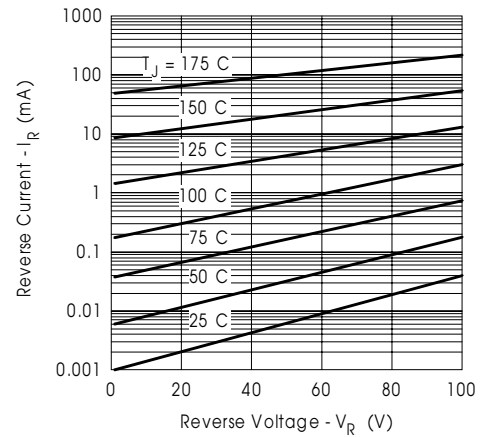


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (PerLeg)

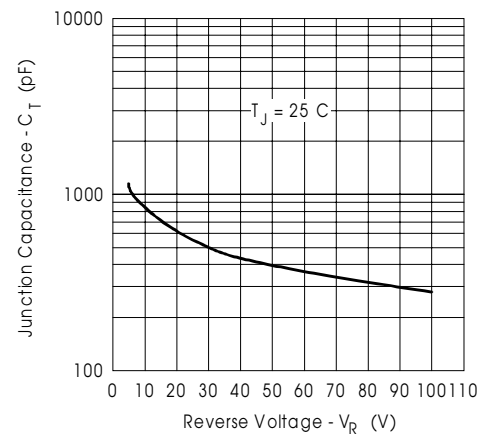


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (PerLeg)

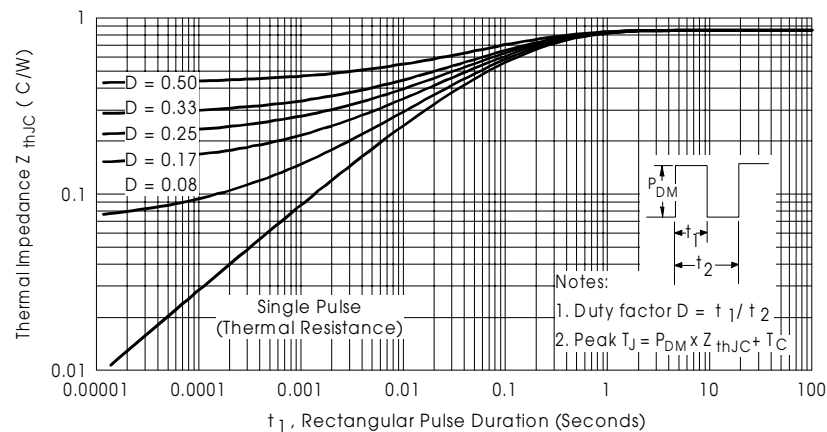


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (PerLeg)

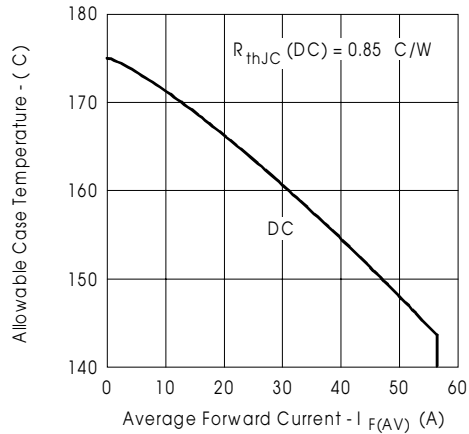


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

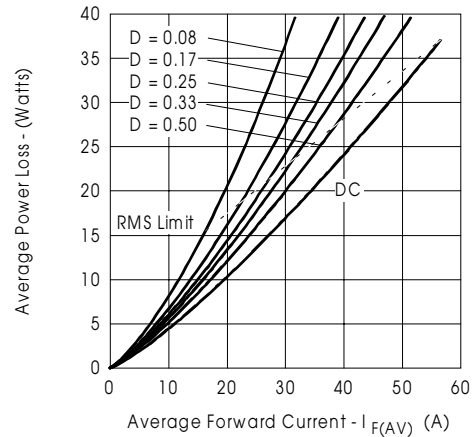


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

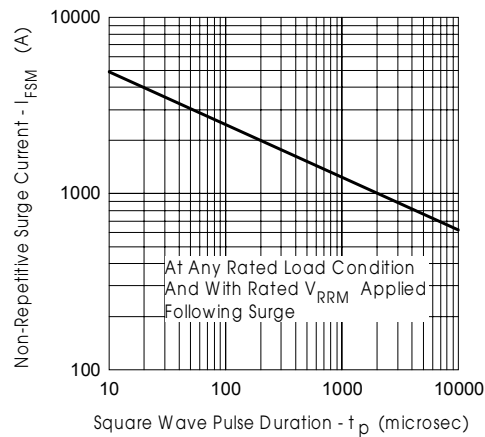


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

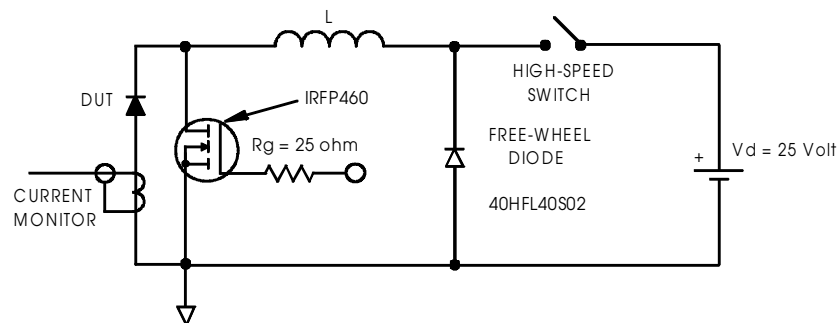
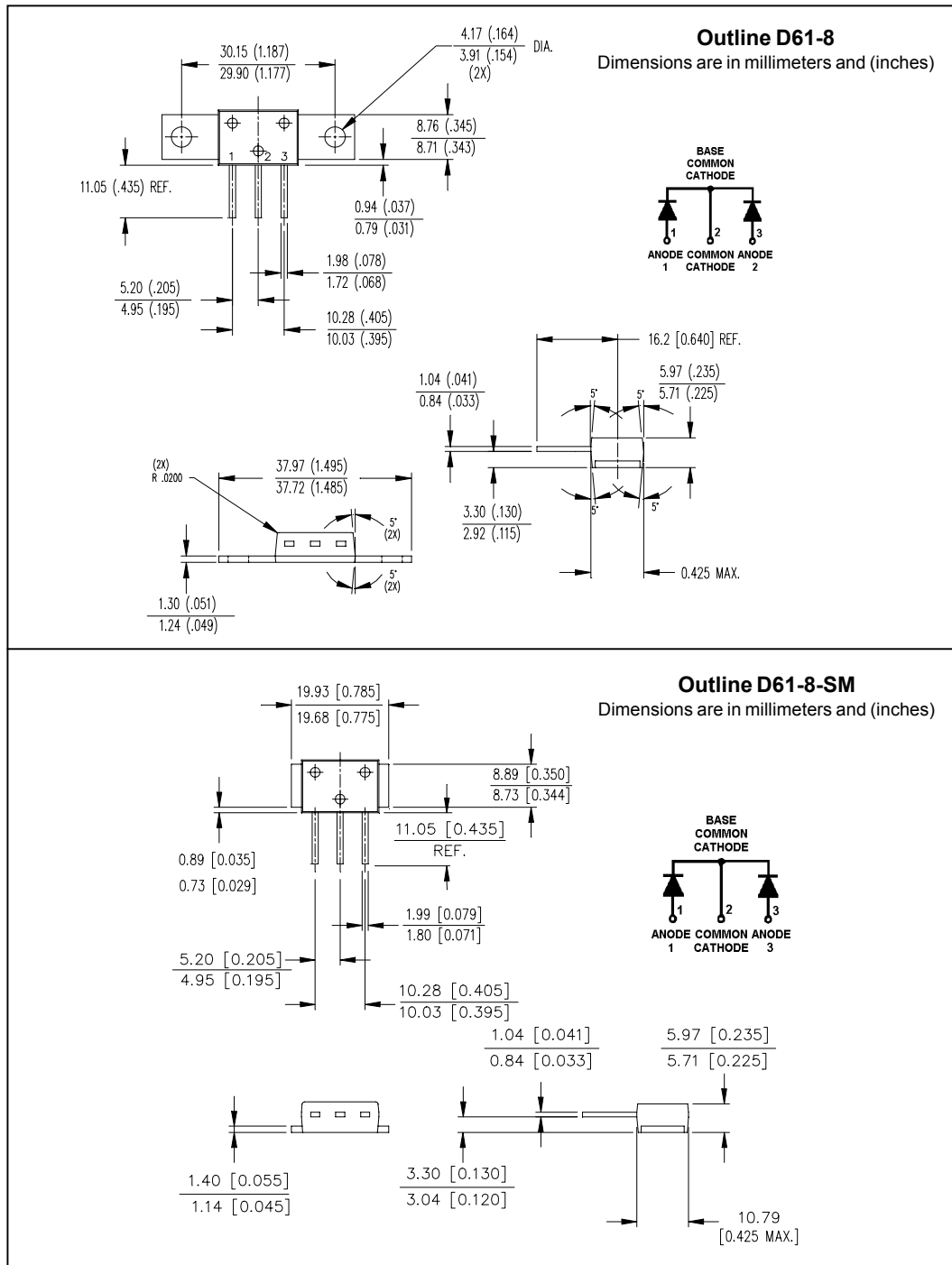
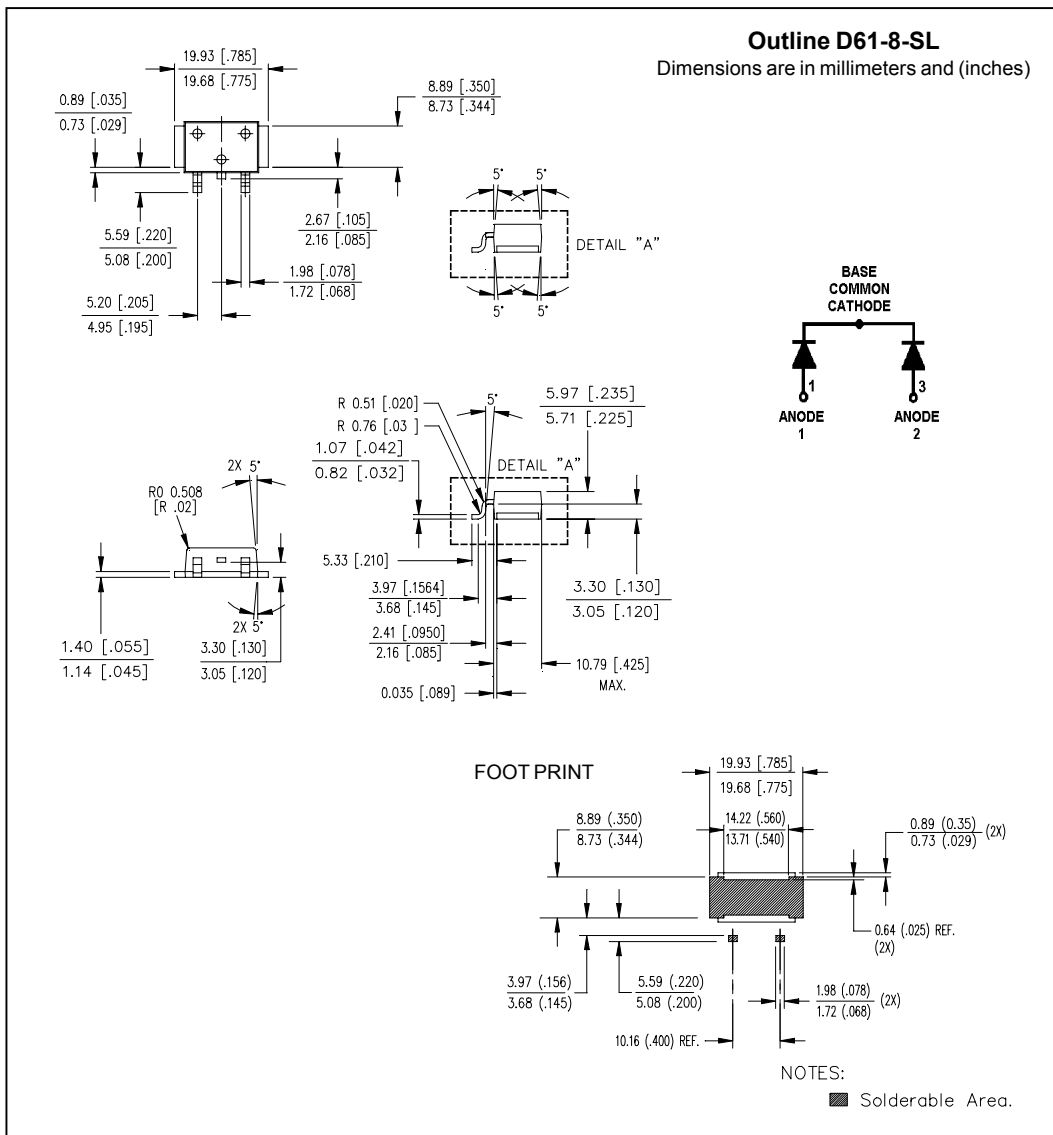


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

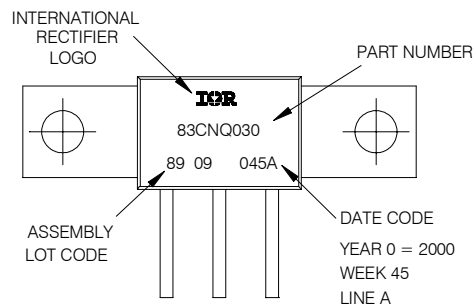


Outline Table



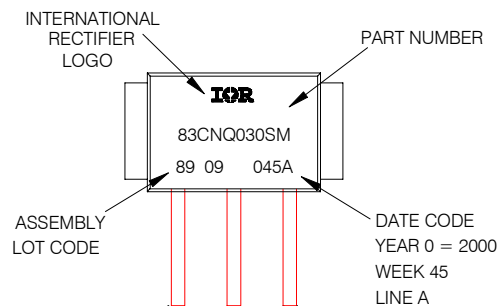
Part Marking Information

EXAMPLE: THIS IS A 83CNQ030 WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000
IN THE ASSEMBLY LINE "A"



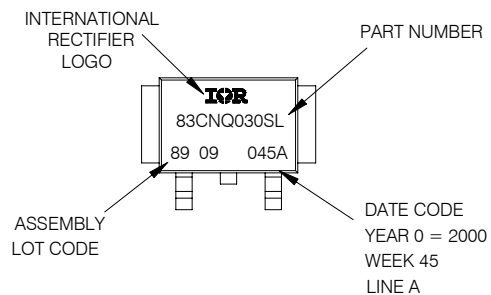
D61-8

EXAMPLE: THIS IS A 83CNQ030SM WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000
IN THE ASSEMBLY LINE "A"



D61-8-SM

EXAMPLE: THIS IS A 83CNQ030SL WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000
IN THE ASSEMBLY LINE "A"



D61-8-SL

83CNQ... Series

Bulletin PD-2.221 rev. E 04/01

International
IR Rectifier

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83CNQ100
*****
* This model has been developed by *
* Wizard SPICE MODEL GENERATOR (1999) *
* (International Rectifier Corporation) *
* contains Proprietary Information *
*****
* SPICE Model Diode is composed by a *
* simple diode plus paralled VCG2T *
*****
.SUBCKT 83CNQ100 ANO CAT
D1 ANO 1 DMOD (0.20831)
*Define diode model
.MODEL DMOD D(IS=3.91765102575707E-04A,N=1.6412007115037,BV=110V,
+IBV=1.66611874283115A,RS=0.001083212,CJO=1.31909764291715E-08,
+VJ=1.04145964983498,XTI=2,EG=0.757359996913038)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=-5.06642501757023)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP((((2.558893E-02/-5.066425)*(V(2,CAT)*1E6)/(I(VX)+1E-6)-1))+1)*3.120336E-
03*ABS(V(ANO,CAT)))-1}}
*****
.ENDS 83CNQ100

Thermal Model Subcircuit
.SUBCKT 83CNQ100 5 1

CTHERM1      5      4      8.75E-04
CTHERM2      4      3      1.99E+00
CTHERM3      3      2      2.04E+01
CTHERM4      2      1      2.41E+02

R THERM1      5      4      1.00E-07
R THERM2      4      3      4.51E-01
R THERM1      3      2      3.08E-01
R THERM1      2      1      7.27E-02

.ENDS 83CNQ100
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International
IR Rectifier

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