

International IOR Rectifier

30CTQ... 30CTQ...S 30CTQ... -1

SCHOTTKY RECTIFIER

30 Amp

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

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

Major Ratings and Characteristics

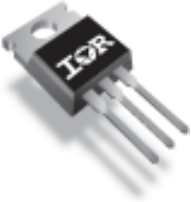


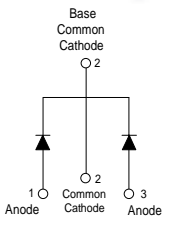
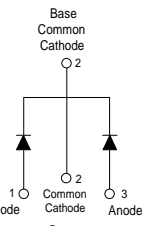
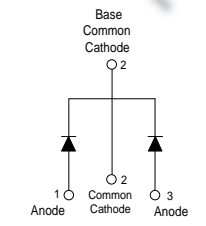
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	30	A
V_{RRM}	35/45	V
I_{FSM} @tp = 5 μ s sine	1060	A
V_F @15 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.56	V
T_J	-55 to 175	$^\circ\text{C}$

Description/ Features

The 30CTQ... 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

Case Styles

30CTQ...	30CTQ... S	30CTQ... -1
		
<p>Base Common Cathode</p>  <p>TO-220</p>	<p>Base Common Cathode</p>  <p>D²PAK</p>	<p>Base Common Cathode</p>  <p>TO-262</p>

Voltage Ratings

Part number	30CTQ035	30CTQ040	30CTQ045
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_{RRM} 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 μsec 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)		

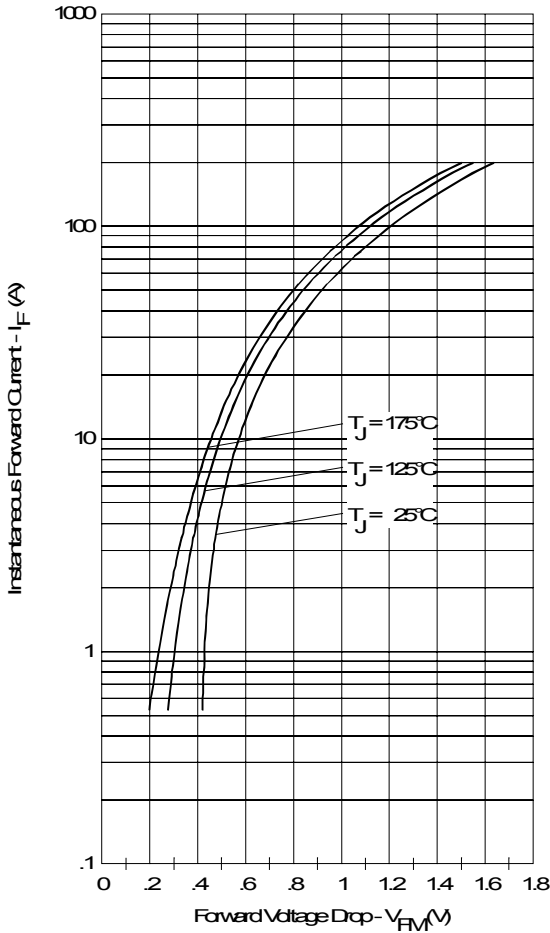


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

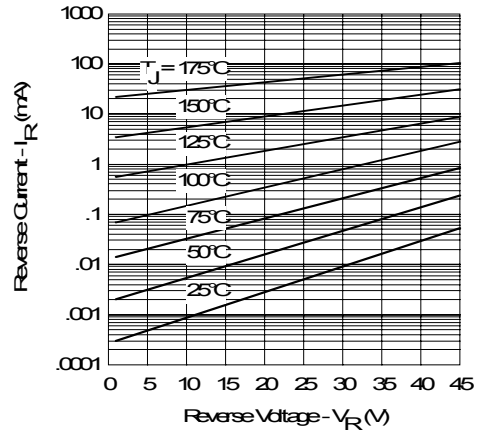


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

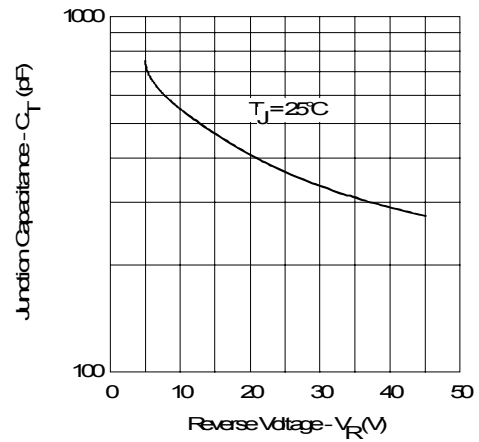


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

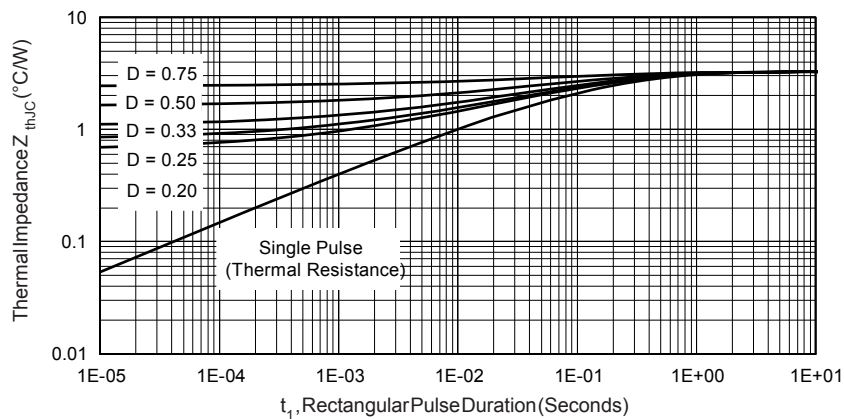


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

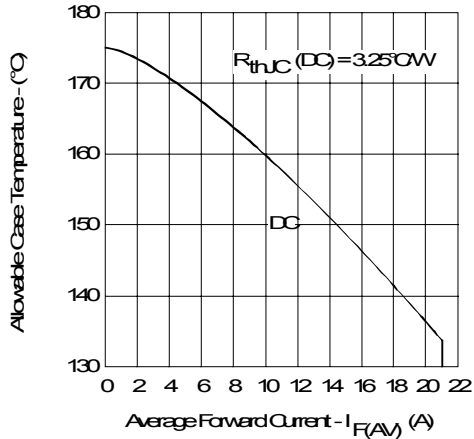


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

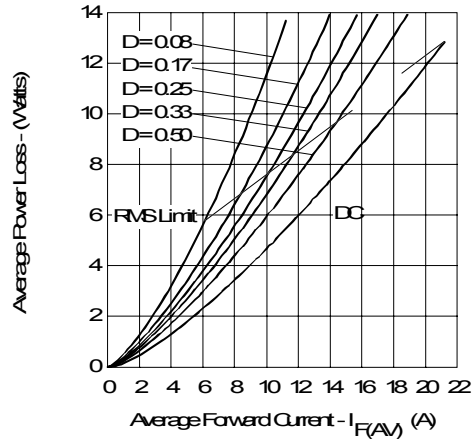


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

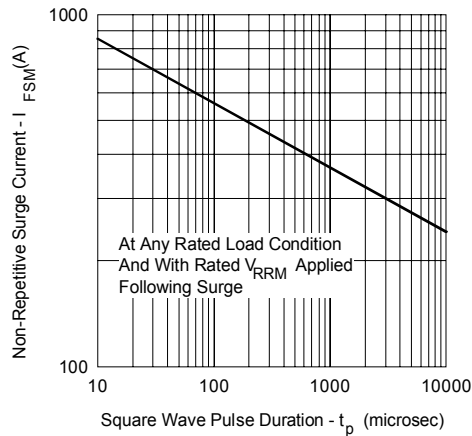


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

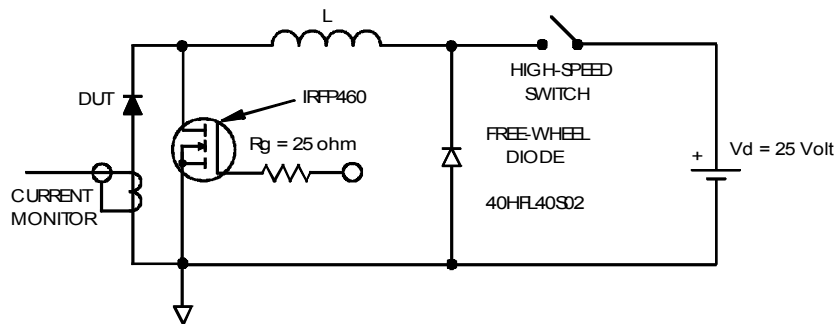


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

Conform to JEDEC outline TO-220AB

NOTES:

- 1- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
- 2- DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
- 3- LEAD DIMENSIONS AND FLASH UNCONTROLLED IN U.S.
- 4- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .025" [0.127] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
- 5- DIMENSION b1, b2 & c1 APPLY TO BASE METAL ONLY.
- 6- CONTROLLING DIMENSION: INCH.
- 7- THERMAL PAD CONTOUR OPTIONAL WITH DIMENSIONS E1, D2 & E1.
- 8- DIMENSION D2 IS AT SECT. A 75% BLACK PLATING AND SOLDERATION UNDESIRABLES ARE ALLOWED.
- 9- OUTLINE CONFORMS TO JEDEC TO-220 EXCEPT A2 (MIN.) AND D2 (MAX.) THESE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	3.56	4.83	.140	.190	
A1	0.51	1.40	.020	.055	
A2	2.03	2.82	.080	.115	
b	0.38	1.01	.015	.040	5
b1	0.38	0.81	.015	.038	
b2	1.14	1.78	.045	.070	5
b3	1.14	1.73	.045	.068	
c	0.16	0.61	.014	.024	5
c1	0.36	0.56	.014	.022	5
D	9.22	16.51	.360	.650	4
D1	6.36	9.02	.330	.355	
D2	11.68	12.88	.460	.507	7
E	8.65	10.67	.380	.420	4, 7
E1	6.86	8.89	.270	.350	7
E2	0.78	-	.030	-	8
e	2.54 BSC	-	.100 BSC	-	
e1	0.68	-	.026	-	
H	14.61	15.88	.570	.625	7, 8
L	12.70	14.73	.500	.580	
L1	-	6.35	-	.250	
L2	1.27	1.78	.050	.070	
L3	0.25 BSC	-	.010 BSC	-	
L4	4.78	5.28	.188	.208	
m	17.78	-	.700	-	
m1	8.89	-	.350	-	
n	11.43	-	.450	-	
o	2.08	-	.082	-	
p	3.81	-	.150	-	
q	0.51	0.71	.020	.028	
q	90°	93°	90°	93°	

LEAD ASSIGNMENTS

1- GATE
2- 4- COLLECTOR
3- SOURCE

IGBTs, Co-PACK

1- GATE
2, 4- COLLECTOR
3- EMITTER

DIODES

1- ANODE *
2, 4- CATHODE
3- ANODE

* PART DEPENDENT.

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

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [0.005] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
5. CONTROLLING DIMENSION: INCH.

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	4
b1	0.51	0.89	.020	.035	
c	1.14	1.78	.045	.070	
c1	0.38	0.74	.015	.029	4
c2	1.14	1.65	.045	.065	
D	8.51	9.65	.335	.380	3
D1	6.86	-	.270	-	
E	9.65	10.67	.380	.420	3
E1	6.22	-	.245	-	
e	2.54 BSC	-	.100 BSC	-	
H	14.61	15.88	.575	.625	
L	1.78	2.79	.070	.110	
L1	1.78	1.65	.070	.065	
L2	1.27	1.78	.050	.070	
L3	0.25 BSC	-	.010 BSC	-	
L4	4.78	5.28	.188	.208	
m	17.78	-	.700	-	
m1	8.89	-	.350	-	
n	11.43	-	.450	-	
o	2.08	-	.082	-	
p	3.81	-	.150	-	
q	0.51	0.71	.020	.028	
q	90°	93°	90°	93°	

LEAD ASSIGNMENTS

1- GATE
2, 4- COLLECTOR
3- SOURCE

IGBTs, Co-PACK

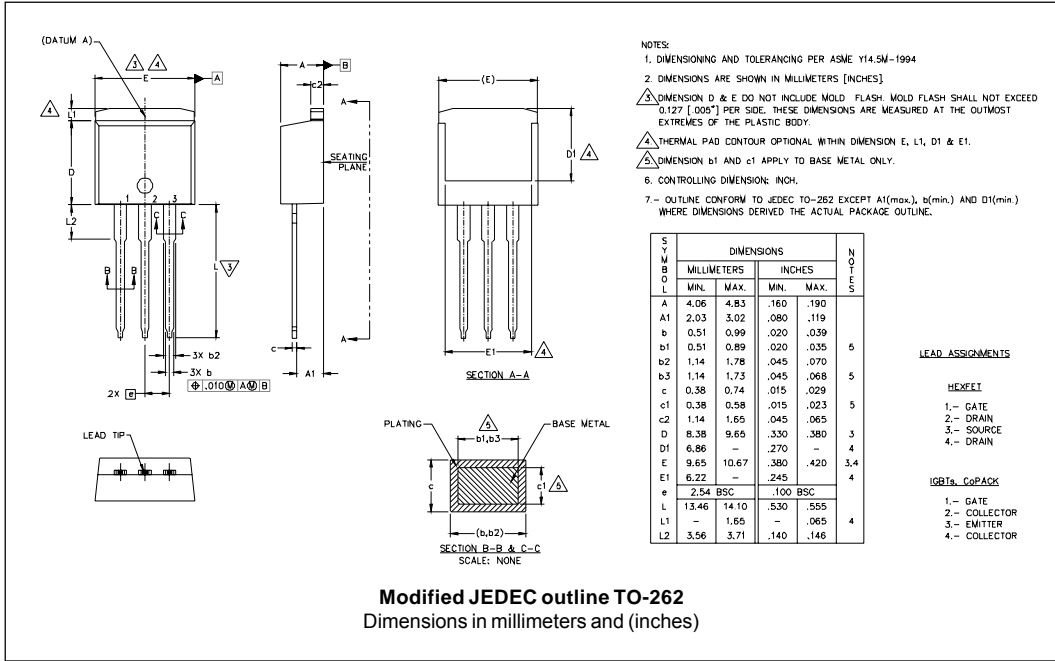
1- GATE
2, 4- COLLECTOR
3- EMITTER

DIODES

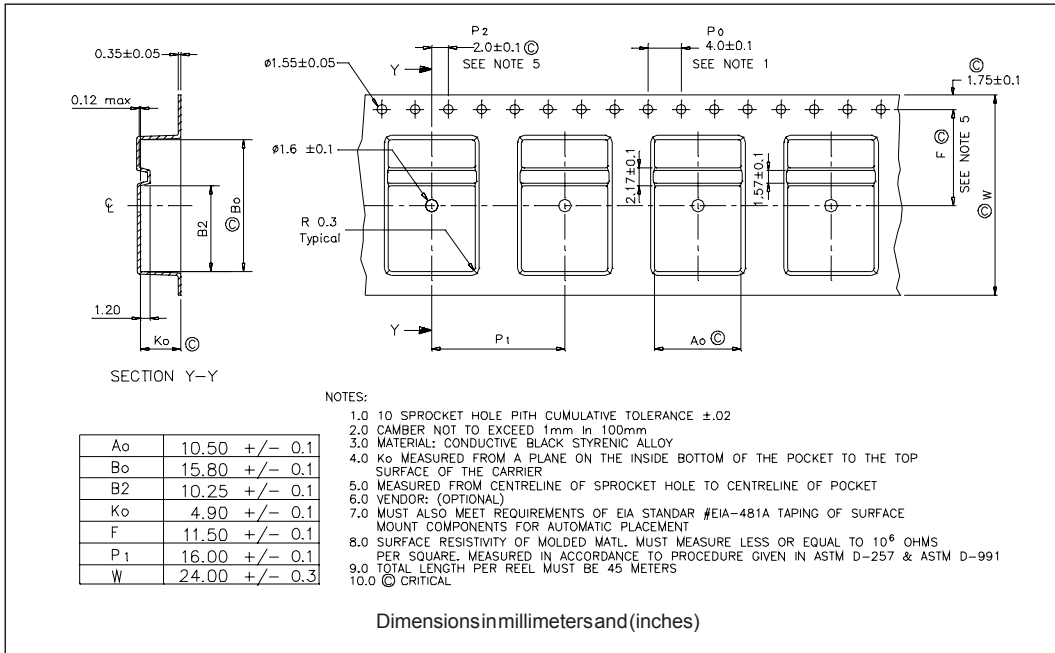
1- ANODE *
2, 4- CATHODE
3- ANODE

* PART DEPENDENT.

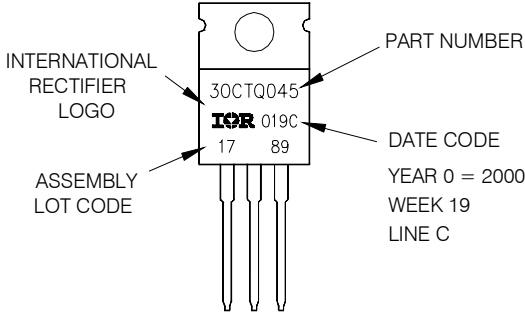
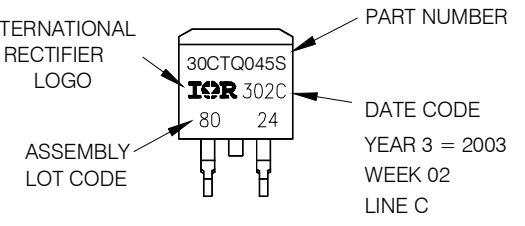
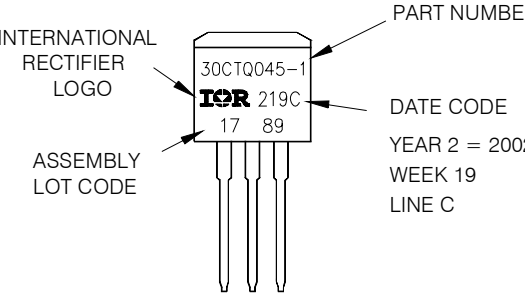
Outline Table



Tape & Reel Information



Part Marking Information

<p>TO-220</p>	<p>EXAMPLE: THIS IS A 30CTQ045 LOT CODE 1789 ASSEMBLED ON WW 19, 2000 IN THE ASSEMBLY LINE "C"</p>	 <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE YEAR 0 = 2000 WEEK 19 LINE C</p>
<p>D²PAK</p>	<p>EXAMPLE: THIS IS A 30CTQ045S LOT CODE 8024 ASSEMBLED ON WW 02, 2003 IN ASSEMBLY LINE "C"</p>	 <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE YEAR 3 = 2003 WEEK 02 LINE C</p>
<p>TO-262</p>	<p>EXAMPLE: THIS IS A 30CTQ045-1 LOT CODE 1789 ASSEMBLED ON WW 19, 2002 IN ASSEMBLY LINE "C"</p>	 <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE YEAR 2 = 2002 WEEK 19 LINE C</p>

Ordering Information Table

Device Code		30	C	T	Q	045	S	TRL	-
		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	-	<ul style="list-style-type: none"> S = D²Pak -1 = TO-262 							
7	-	<ul style="list-style-type: none"> none = Tube (50 pieces) TRL = Tape & Reel (Left Oriented - for D²Pak only) TRR = Tape & Reel (Right Oriented - for D²Pak only) 							
8	-	<ul style="list-style-type: none"> none = Standard Production PbF = Lead-Free 							

035 = 35V
 040 = 40V
 045 = 45V

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.