

Bulletin PD-20332 rev. B 01/04

International
IR Rectifier

30CTQ045
30CTQ045S
30CTQ045 -1

SCHOTTKY RECTIFIER

30 Amp

$I_{F(AV)} = 30\text{Amp}$
 $V_R = 35 \text{ to } 45\text{V}$

Major Ratings and Characteristics

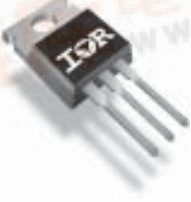
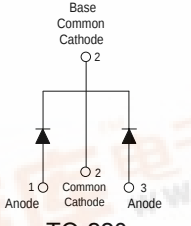
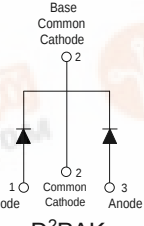
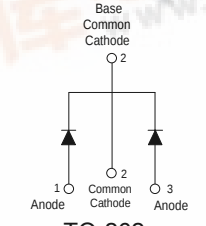
Characteristics	30CTQ	Units
$I_{F(AV)}$ Rectangular waveform	30	A
V_{RRM}	35 to 45	V
I_{FSM} @tp = 5 μ s sine	1060	A
V_F @15 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.56	V
T_J	-55 to 175	$^\circ\text{C}$

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
  TO-220	  D ² PAK	  TO-262



30CTQ... Series

Bulletin PD-20332 rev. B 01/04

International
IRF Rectifier

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	5 μs Sine or 3 μs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied	
		265		10ms Sine or 6ms Rect. pulse		
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	T _J = 25 °C
		0.76	V	@ 30A	
		0.56	V	@ 15A	T _J = 125 °C
		0.70	V	@ 30A	
I _{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	2	mA	T _J = 25 °C	V _R = rated V _R
		15	mA	T _J = 125 °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	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.63	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C/W}$	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)	

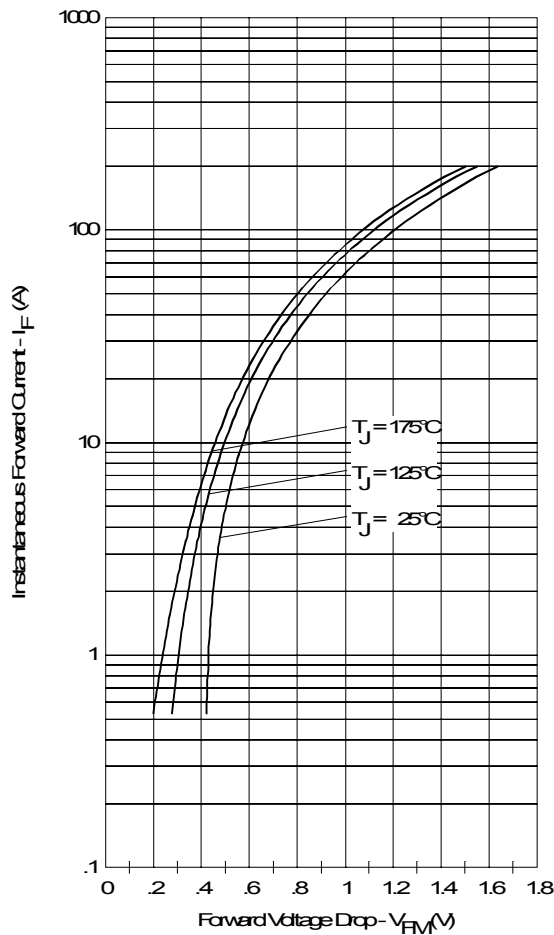


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

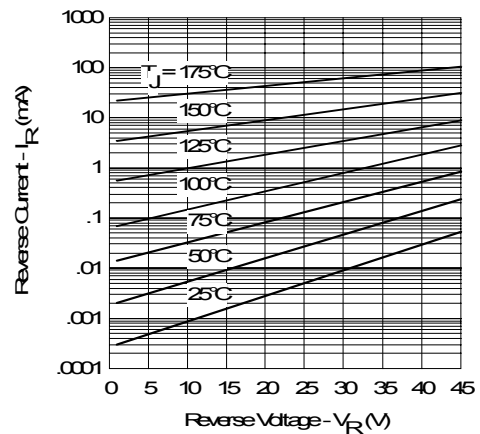


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

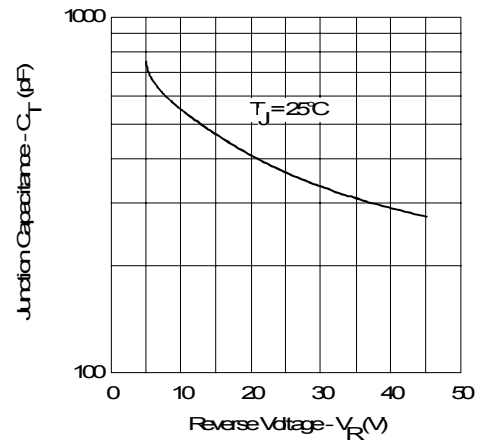


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

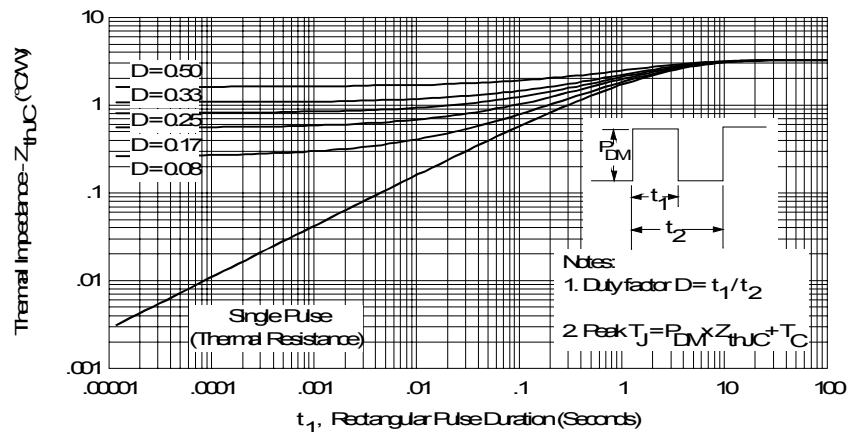


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

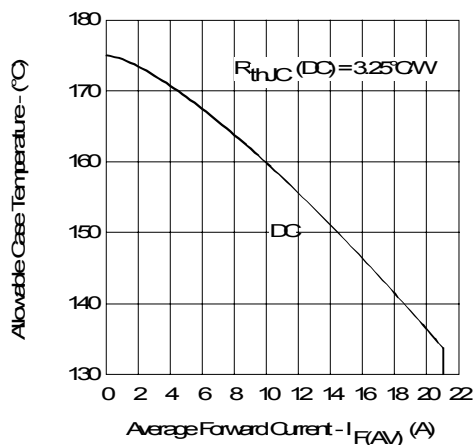


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

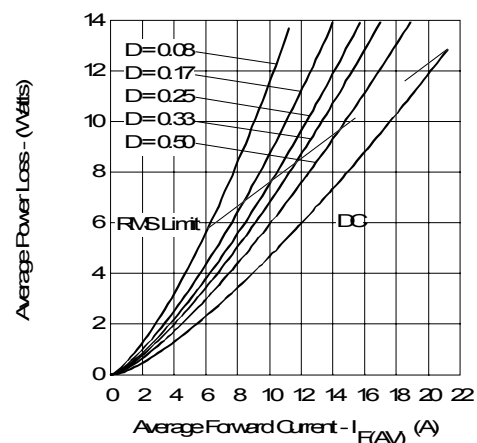


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

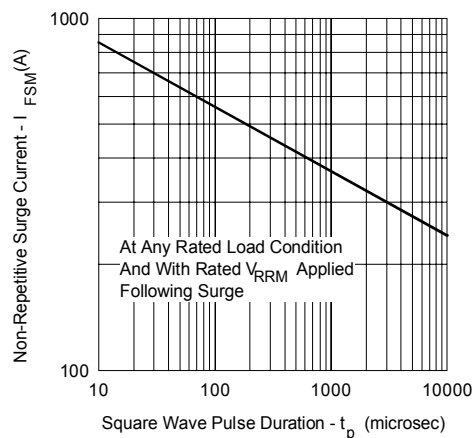


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

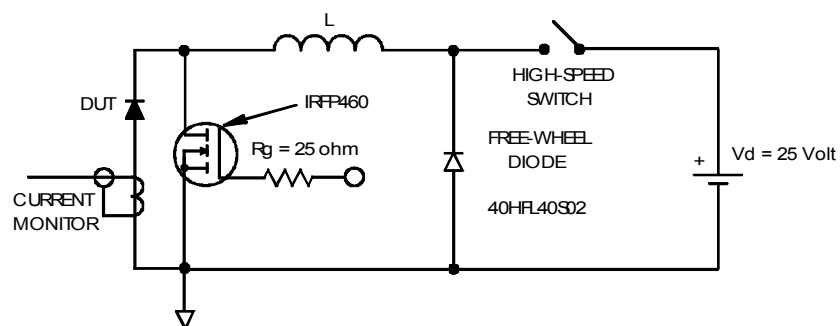
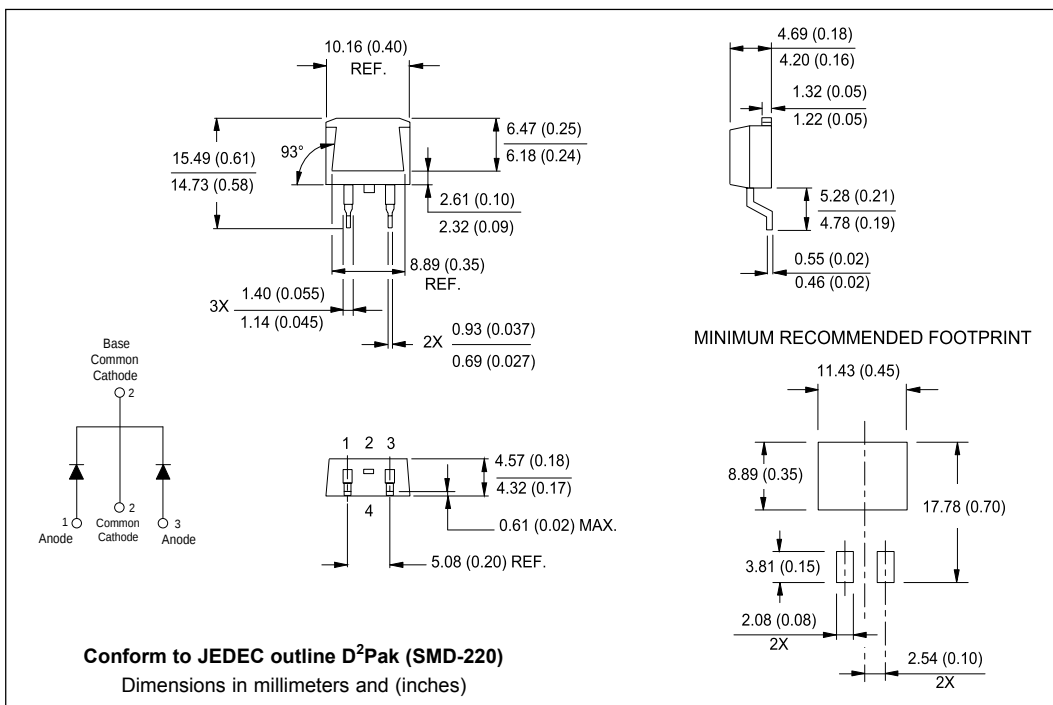
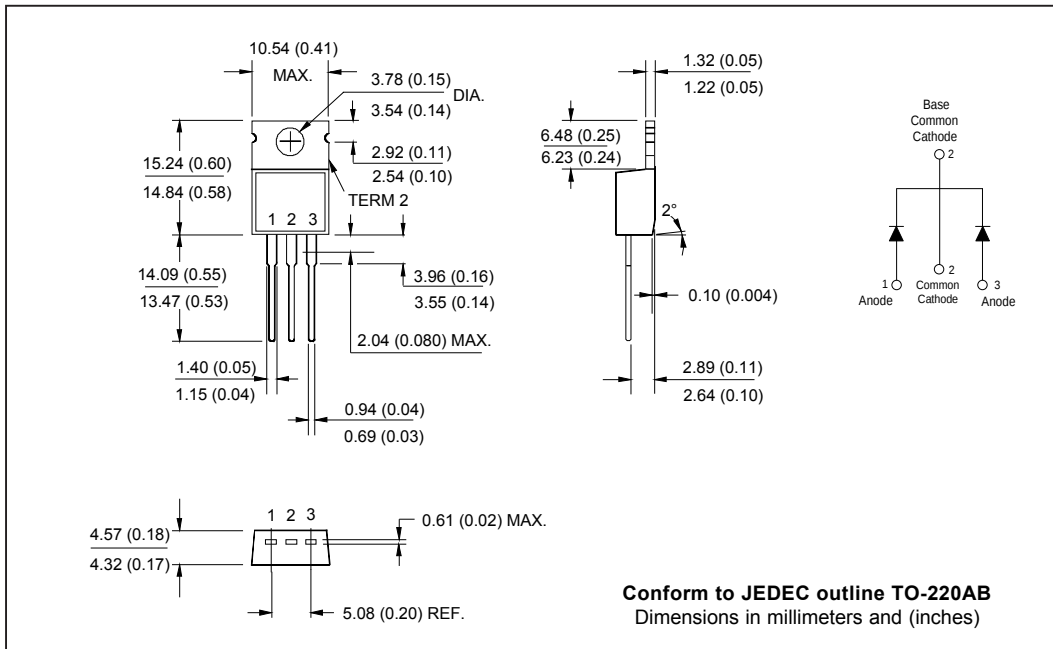


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



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

PIN CONFIGURATION:

```

  Base
  Common
  Cathode
    |
    | 2
    |
  1   |   3
  ○   |   ○
  Anode | Anode
  
```

CROSS-SECTION (SECTION X-X):

- Top width: 0.55 (0.022)
- Bottom width: 0.45 (0.018)
- Top thickness: 0.939 (0.037)
- Bottom thickness: 0.686 (0.027)

MAIN DIMENSIONS:

- Overall width: 10.54 (0.415)
- Terminal 2 width: 10.29 (0.405)
- Terminal 2 height: 1.15 (0.45) MIN.
- Terminal 2 reference height: 10.16 (0.400) REF.
- Terminal 2 reference height: 10.00 (0.394)
- Terminal 2 height: 8.76 (0.345)
- Terminal 2 height: 8.61 (0.339)
- Terminal 2 height: 1.40 (0.055) MAX.
- Terminal 2 height: 1.32 (0.052)
- Terminal 2 height: 1.22 (0.048)
- Terminal 2 height: 2.89 (0.114)
- Terminal 2 height: 2.64 (0.104)
- Terminal 2 height: 3.96 (0.156)
- Terminal 2 height: 3.55 (0.140)
- Terminal 2 height: 1.40 (0.055)
- Terminal 2 height: 1.15 (0.045)
- Terminal 2 height: 14.09 (0.555)
- Terminal 2 height: 13.47 (0.530)
- Terminal 2 height: 24.25 (0.955)
- Terminal 2 height: 23.47 (0.924)
- Terminal 2 height: 10.16 (0.400) REF.
- Terminal 2 height: 10.00 (0.394)
- Terminal 2 height: 8.76 (0.345)
- Terminal 2 height: 8.61 (0.339)
- Terminal 2 height: 1.40 (0.055) MAX.
- Terminal 2 height: 1.32 (0.052)
- Terminal 2 height: 1.22 (0.048)
- Terminal 2 height: 2.89 (0.114)
- Terminal 2 height: 2.64 (0.104)
- Terminal 2 height: 3.96 (0.156)
- Terminal 2 height: 3.55 (0.140)
- Terminal 2 height: 1.40 (0.055)
- Terminal 2 height: 1.15 (0.045)
- Terminal 2 height: 14.09 (0.555)
- Terminal 2 height: 13.47 (0.530)
- Terminal 2 height: 24.25 (0.955)
- Terminal 2 height: 23.47 (0.924)

TERMINAL DIMENSIONS:

- Terminal 1-ANODE: 4.57 (0.180)
- Terminal 1-ANODE: 4.32 (0.170)
- Terminal 1-ANODE: 5.33 (0.210)
- Terminal 1-ANODE: 4.83 (0.190)
- Terminal 2-CATHODE: 0.61 (0.024) MAX.
- Terminal 3-ANODE: 2.79 (0.110)
- Terminal 3-ANODE: 2.29 (0.090)

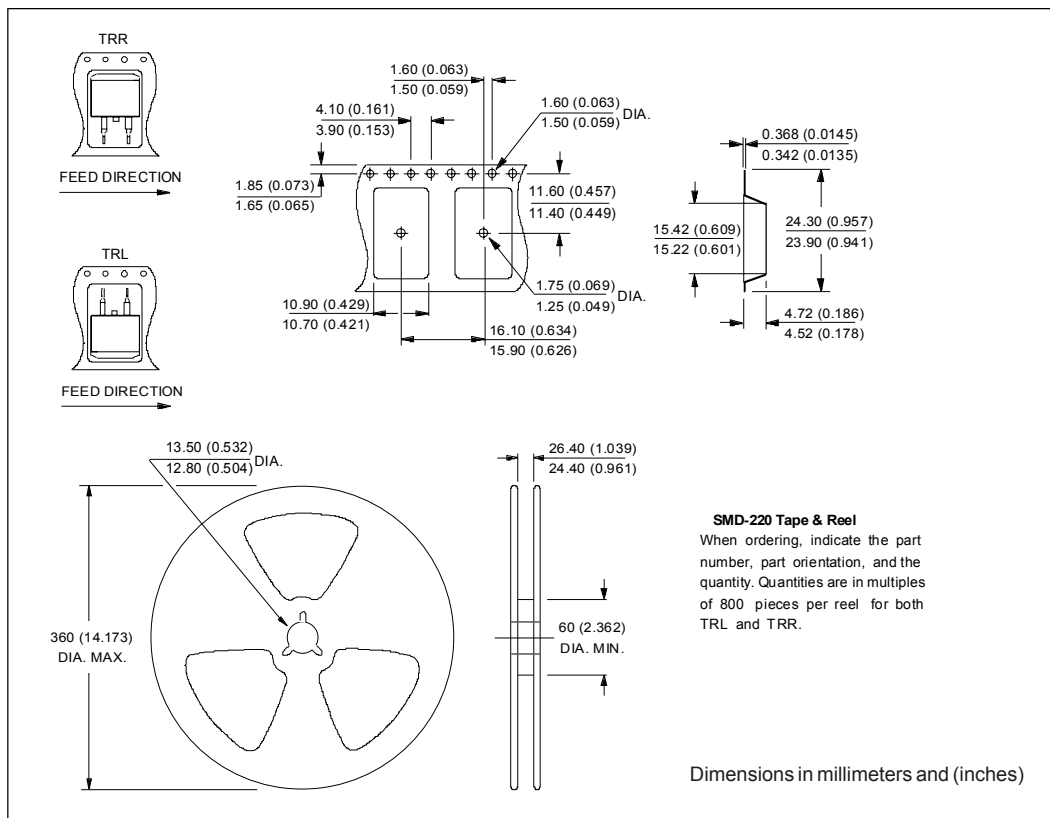
EXAMPLE: THIS IS A 30CTQ045-1
LOT CODE 1789
ASSEMBLED ON WW 19, 1997
IN THE ASSEMBLY LINE "C"

The diagram shows a rectangular component with four pins at the bottom. The top surface is labeled with the following information:

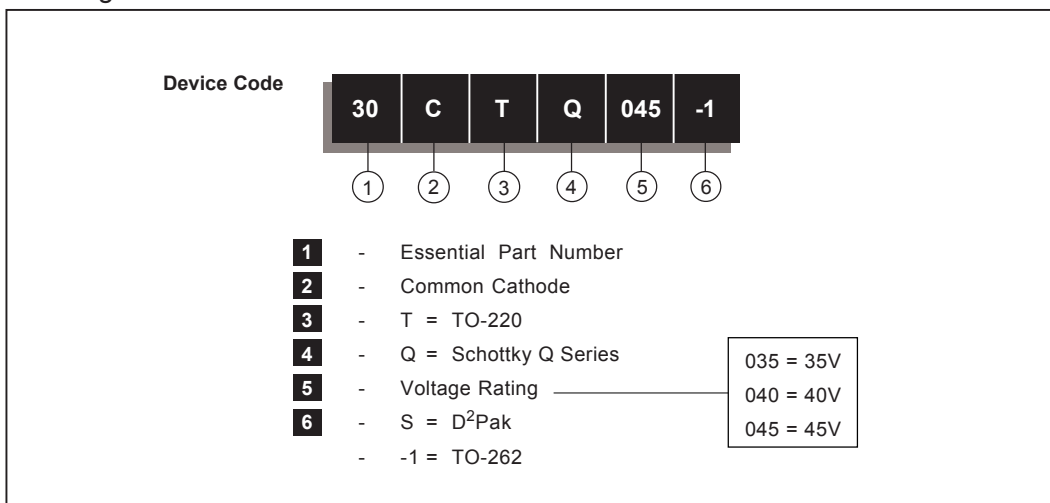
- 30CTQ045-1**: Part Number
- IOR**: International Rectifier Logo
- 719C**: Date Code (Year 7 = 1997, Week 19)
- 17 89**: Assembly Lot Code

Arrows point from the text labels to the corresponding markings on the component.

Tape & Reel Information



Ordering Information Table



30CTQ... Series

Bulletin PD-20332 rev. B 01/04

International
IOR Rectifier

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. 01/04