

International
IOR Rectifier

20CTQ...
20CTQ...S
20CTQ... -1

SCHOTTKY RECTIFIER

20 Amp

$$I_{F(AV)} = 20\text{Amp}$$

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

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	20	A
V_{RRM} range	35 / 45	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ sine	1060	A
V_F @ 10 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.57	V
T_J range	-55 to 175	$^\circ\text{C}$

Description/Features

The 20CTQ center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175°C T_J operation
- Center tap TO-220 package
- 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

20CTQ...	20CTQ... S	20CTQ... -1
 Base Common Cathode 2 1 2 3 Anode Common Cathode Anode TO-220	 Base Common Cathode 2 1 2 3 Anode Common Cathode Anode D²PAK	 Base Common Cathode 2 1 2 3 Anode Common Cathode Anode TO-262

Voltage Ratings

Part number	20CTQ035	20CTQ040	20CTQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters		20CTQ	Units	Conditions		
I _{F(AV)}	Max. Average Forward Current * See Fig. 5	20	A	50% duty cycle @ T _C = 145°C, rectangular wave form		
I _{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1060	A	5μs Sine or 3μs 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)	13	mJ	T _J = 25 °C, I _{AS} = 2.0 Amps, L = 6.5 mH		
I _{AR}	Repetitive Avalanche Current (Per Leg)	2.0	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		20CTQ	Units	Conditions	
V _{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.64	V	@ 10A	T _J = 25 °C
		0.76	V	@ 20A	
		0.57	V	@ 10A	T _J = 125 °C
		0.68	V	@ 20A	
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	20CTQ	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)	

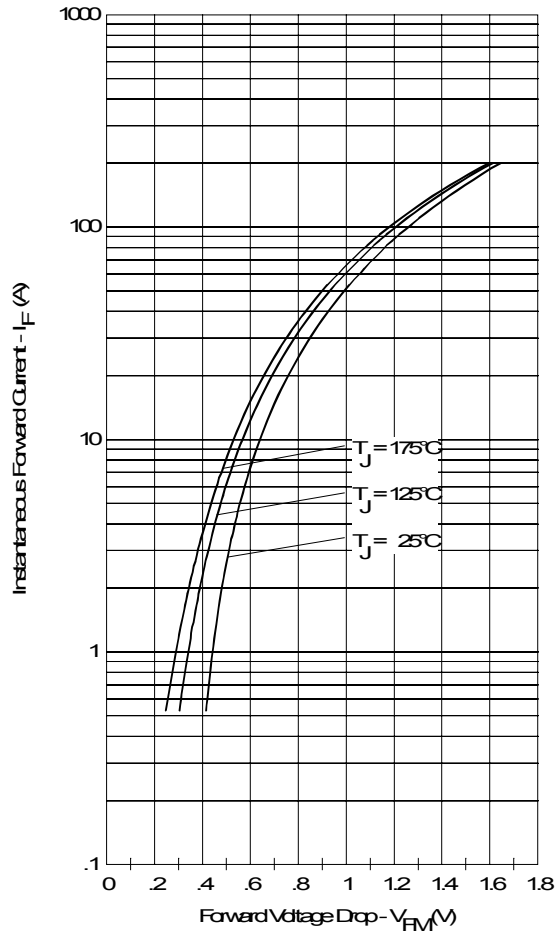


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

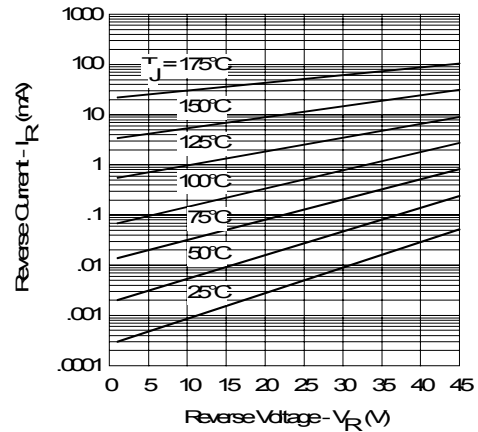


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

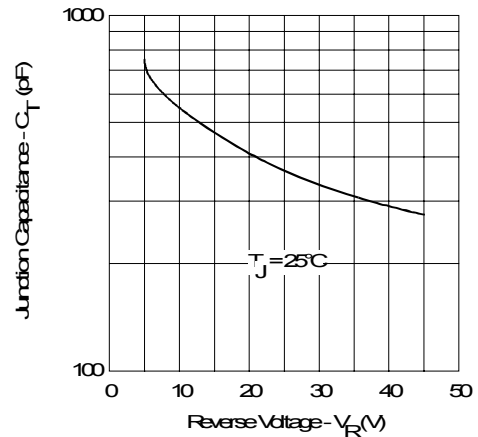


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

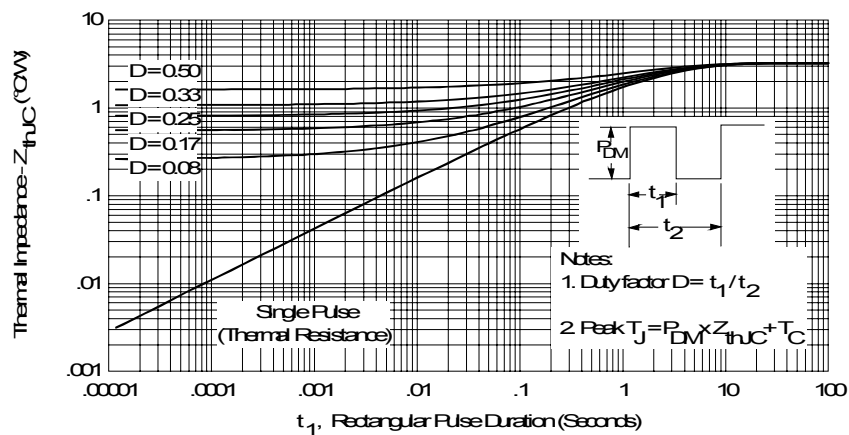


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

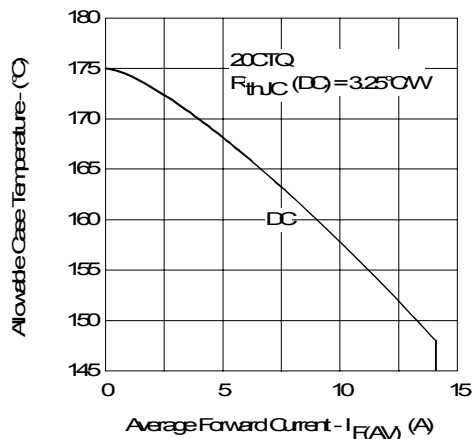


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

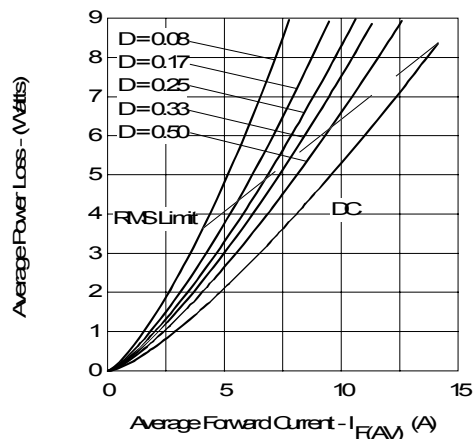


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

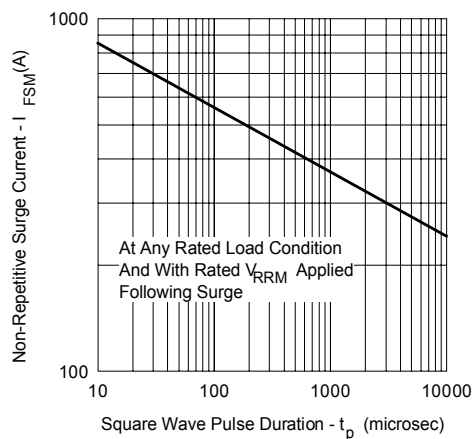


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

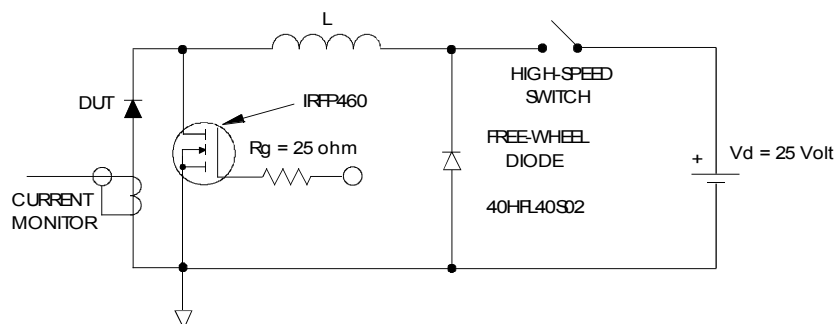
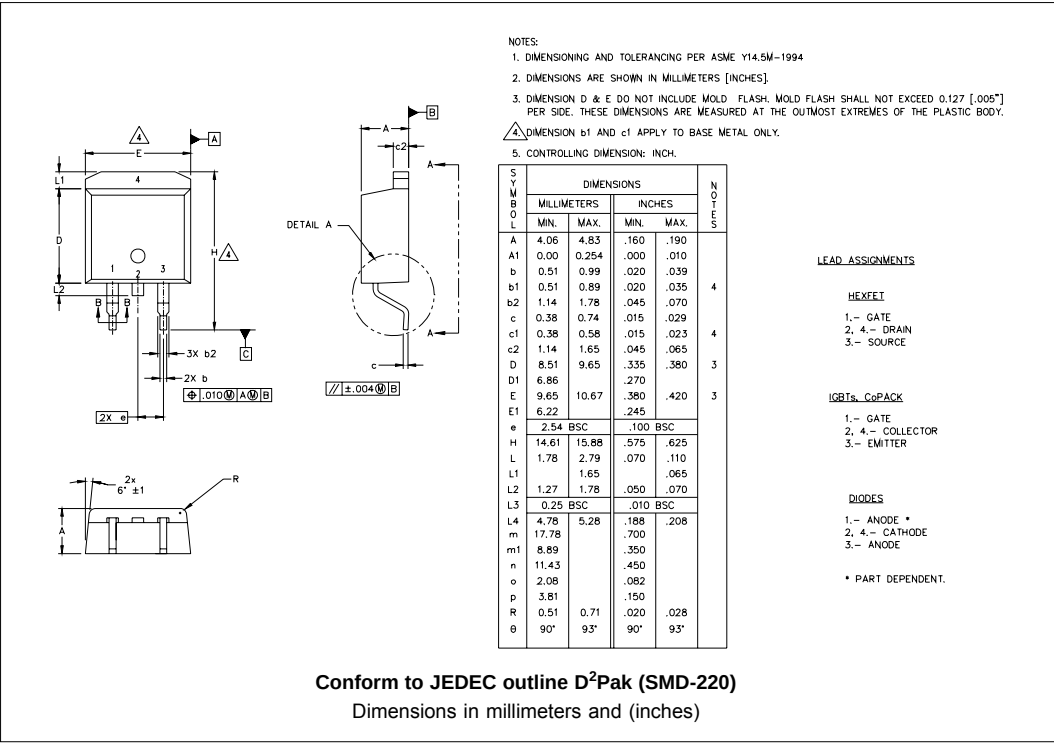
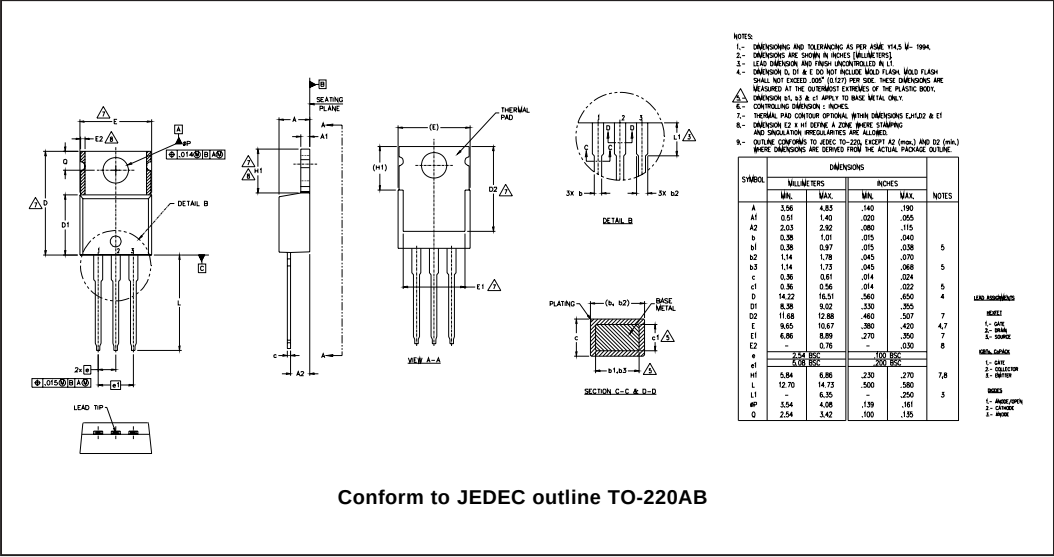
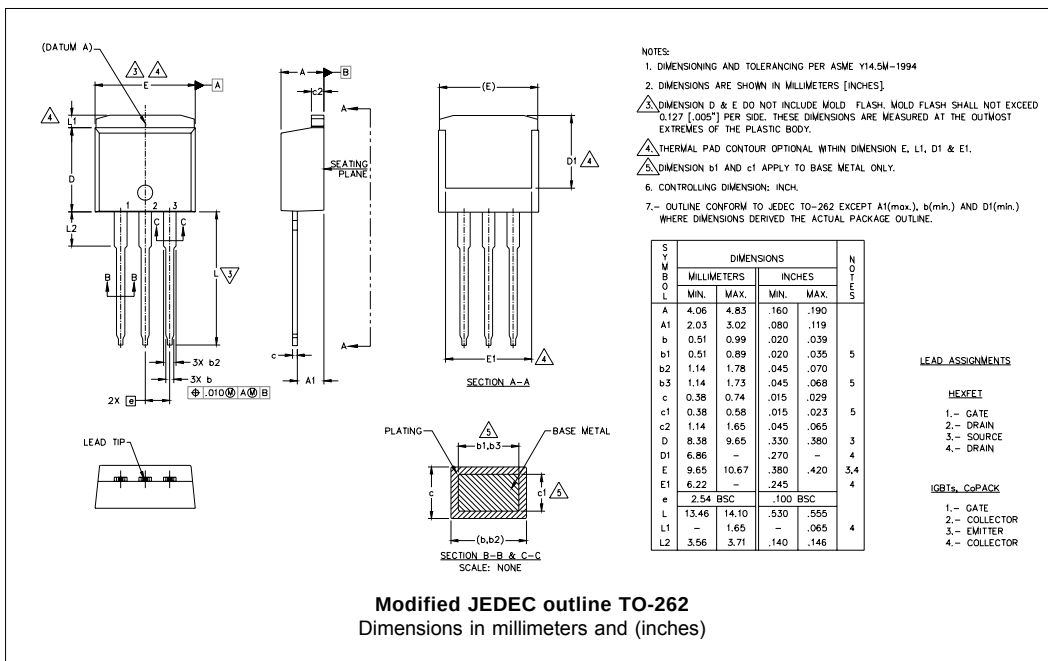


Fig. 8 - Unclamped Inductive Test Circuit

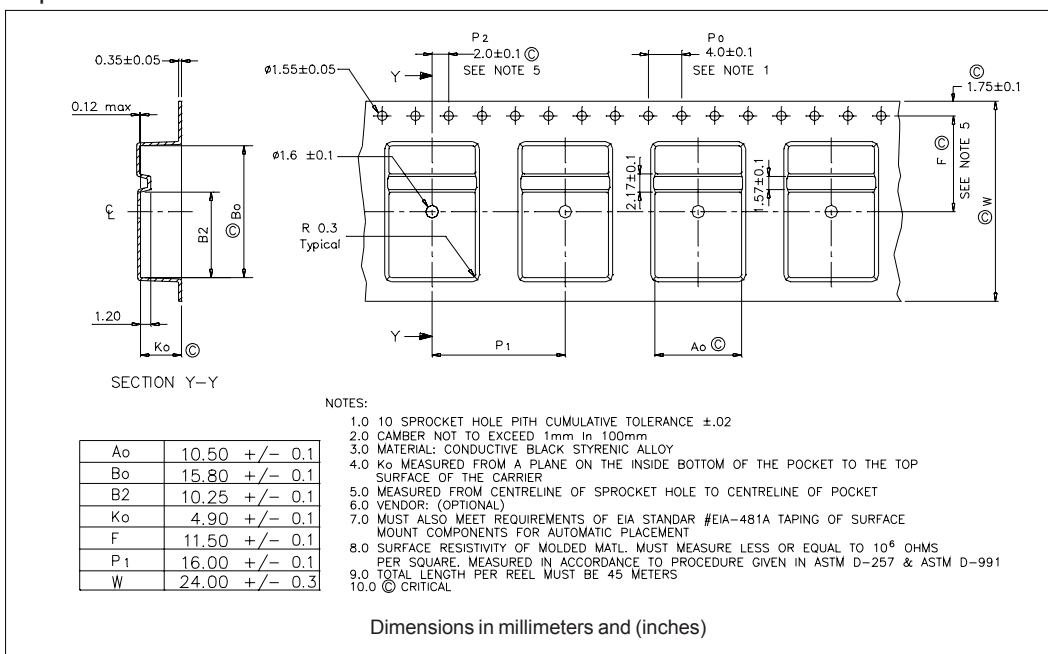
Outline Table



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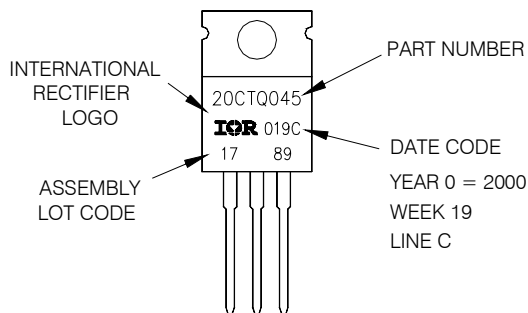
Tape & Reel Information



Part Marking Information

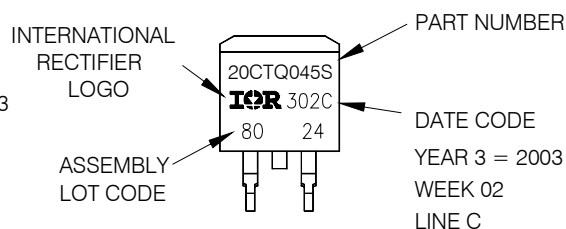
TO-220

EXAMPLE: THIS IS A 20CTQ045
LOT CODE 1789
ASSEMBLED ON WW 19, 2000
IN THE ASSEMBLY LINE "C"



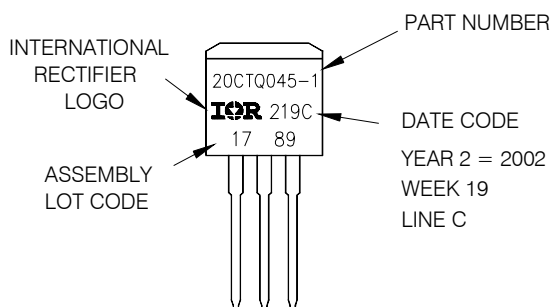
D²PAK

EXAMPLE: THIS IS A 20CTQ045S
LOT CODE 8024
ASSEMBLED ON WW 02, 2003
IN ASSEMBLY LINE "C"



TO-262

EXAMPLE: THIS IS A 20CTQ045-1
LOT CODE 1789
ASSEMBLED ON WW 19, 2002
IN ASSEMBLY LINE "C"



Ordering Information Table

Device Code							
	20	C	T	Q	045	S	TRL -
	1	2	3	4	5	6	7 8
1	-	Current Rating (20A)					
2	-	Circuit Configuration					
		C = Common Cathode					
3	-	T = TO-220					
4	-	Schottky "Q" Series					
5	-	Voltage Ratings					
6	-	- S = D²Pak -1= TO-262					
7	-	- none = Tube (50 pieces) - TRL = Tape & Reel (Left Oriented - for D²Pak only) - TRR = Tape & Reel (Right Oriented - for D²Pak only)					
8	-	- none = Standard Production - PbF = Lead-Free					

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
IR Rectifier

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