

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

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

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...PbF 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.

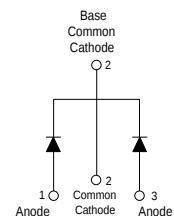
- 175°C T_J operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles

20CTQ...PbF



TO-220



Voltage Ratings

Part number	20CTQ035PbF	20CTQ040PbF	20CTQ045PbF
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)		
Marking Device	20CTQ045		

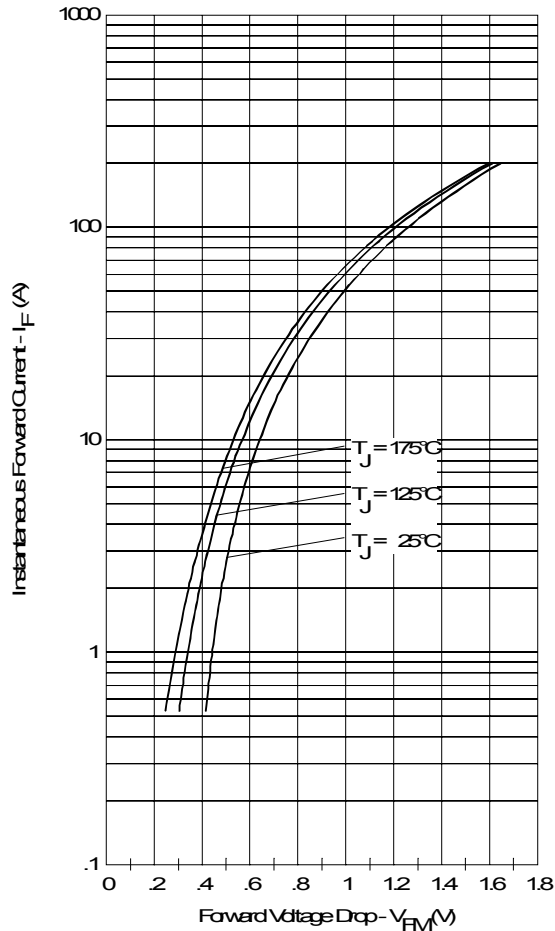


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

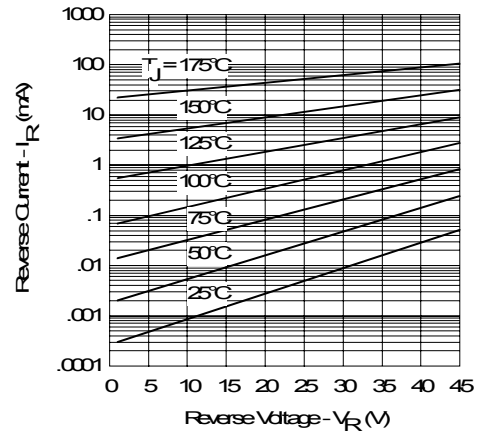


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

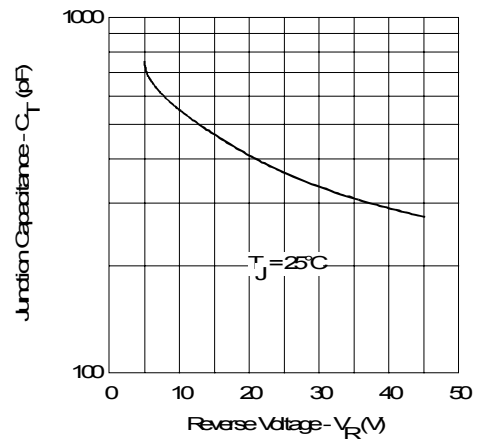


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

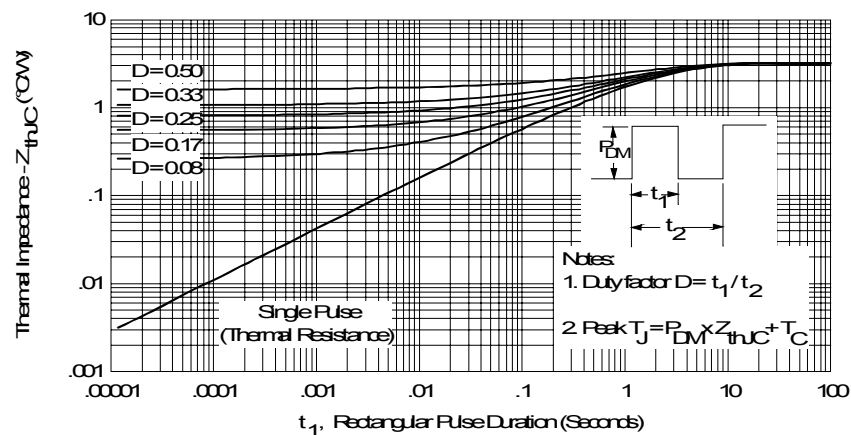


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

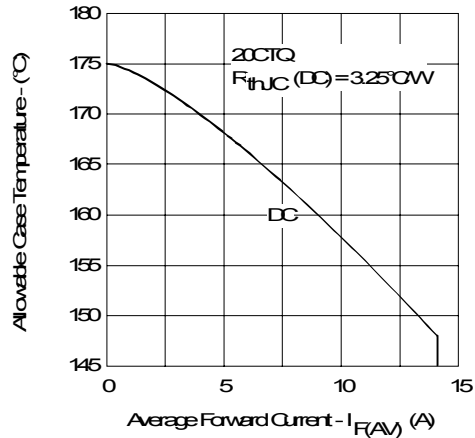


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

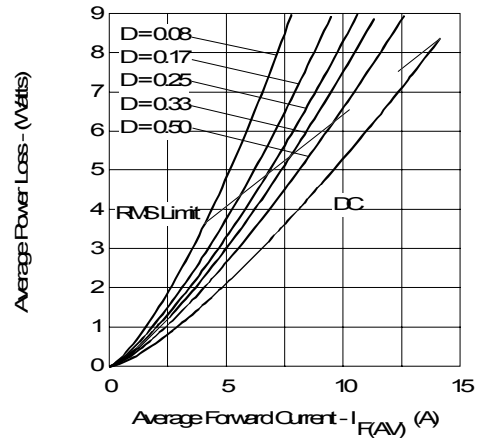


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

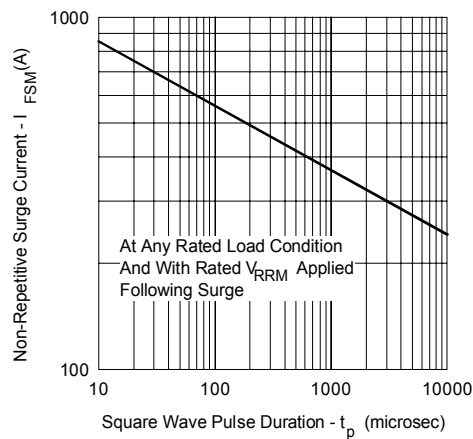


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

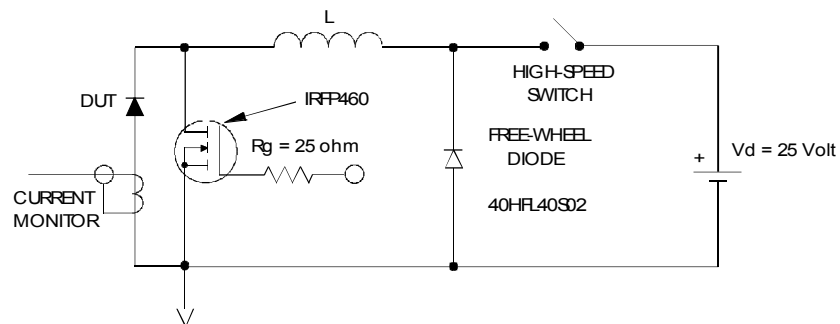
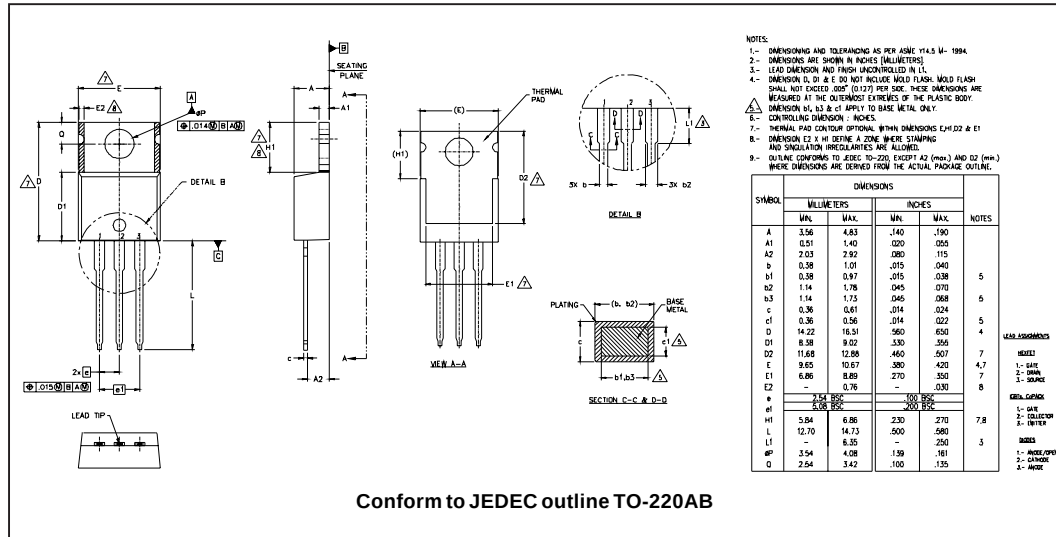
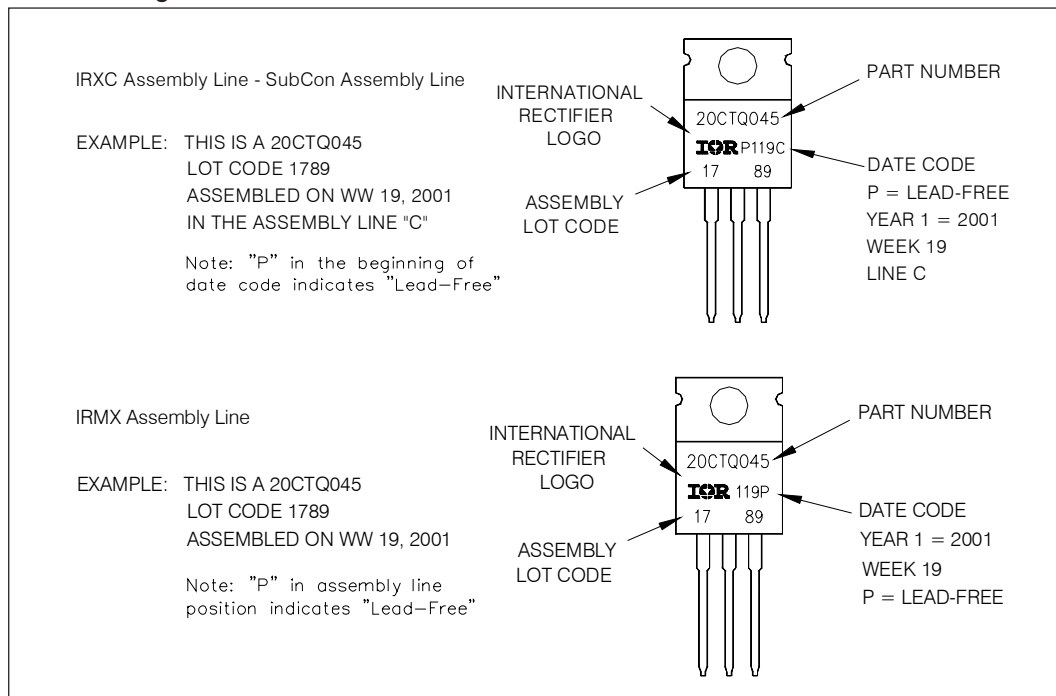


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



Part Marking Information



Ordering Information Table

Device Code

20	C	T	Q	045	PbF
①	②	③	④	⑤	⑥

- 1** - Current Rating (20 = 20A)
- 2** - Circuit Configuration
C = Common Cathode
- 3** - Package
T = TO-220
- 4** - Schottky "Q" Series
- 5** - Voltage Ratings
- 6** -
 - none = Standard Production
 - PbF = Lead-Free

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

Tube Standard Pack Quantity : 50 pieces

Data and specifications subject to change without notice.
 This product has been designed and qualified for Industrial Level and Lead-Free.
 Qualification Standards can be found on IR's Web site.

International
IR 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. 05/06