Bulletin PD-20841 09/04

International
IOR Rectifier

20TQ...PbF Series

SCHOTTKY RECTIFIER 20 Amp

$I_{F(AV)}$ = 20Amp
V_R = 35/ 45V

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	20	A
V_{RRM}	range	35/45	V
I_{FSM}	@tp = 5 µs sine	1800	A
V_F	@20 Apk, T_J = 125°C	0.51	V
T_J	range	-55 to 150	°C

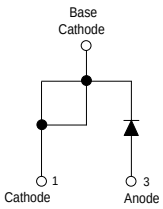
Description/ Features

The 20TQ...PbF Schottky rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C T_J operation
- 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
- Lead-Free ("PbF" suffix)

Case Styles

20TQ...PbF



TO-220AC

Voltage Ratings

	Part number	20TQ035PbF	20TQ040PbF	20TQ045PbF
V_R	Max. DC Reverse Voltage (V)	35	40	45
V_{RWM}	Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

	Parameters	20TQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 5	20	A	50% duty cycle @ T_C = 116° C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	1800	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	400		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	27	mJ	T_J = 25 °C, I_{AS} = 4 Amps, L = 3.4 mH	
I_{AR}	Repetitive Avalanche Current	4	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	20TQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1) * See Fig. 1	0.57	V	@ 20A	T_J = 25 °C
		0.73	V	@ 40A	
		0.51	V	@ 20A	T_J = 125 °C
		0.67	V	@ 40A	
I_{RM}	Max. Reverse Leakage Current (1) * See Fig. 2	2.7	mA	T_J = 25 °C	V_R = rated V_R
		105	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance	1400	pF	V_R = 5V_{DC} (test signal range 100Khz to 1Mhz) 25 °C	
L_S	Typical Series Inductance	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 < 300µs, Duty Cycle < 2%

Thermal-Mechanical Specifications

	Parameters		20TQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case		1.50	°C/W	DC operation * See Fig. 4
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°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		20TQ045		

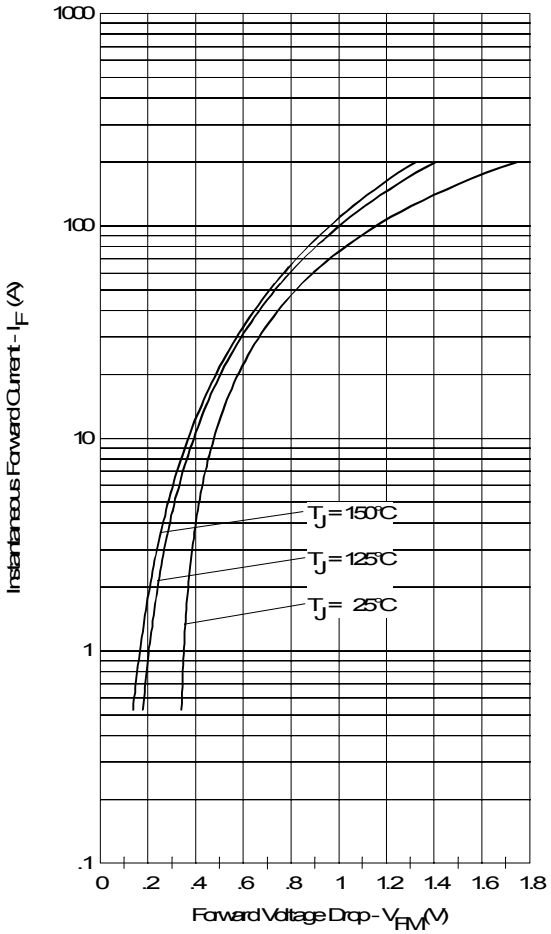


Fig. 1 - Maximum Forward Voltage Drop Characteristics

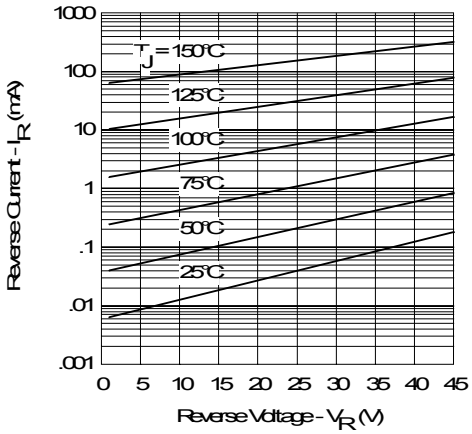


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

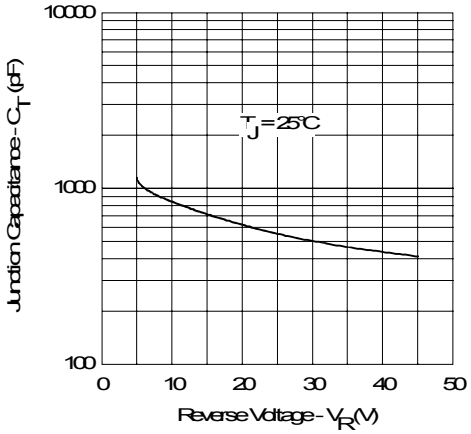


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

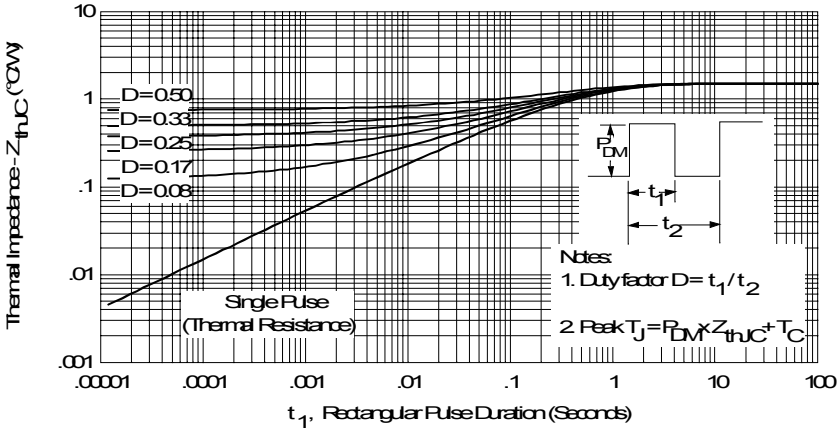


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

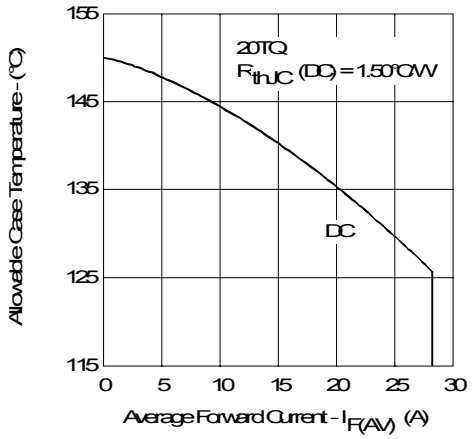


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

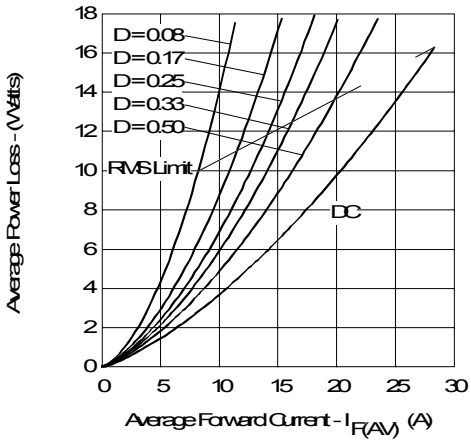


Fig. 6 - Forward Power Loss Characteristics

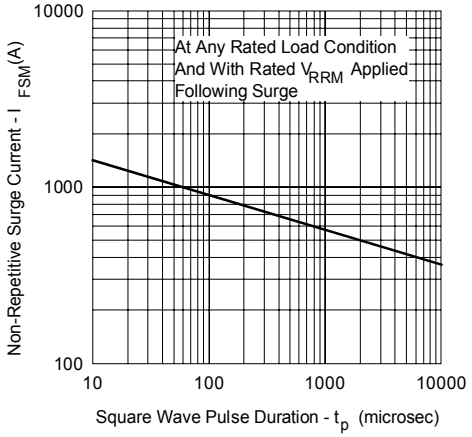


Fig. 7 - Maximum Non-Repetitive Surge Current

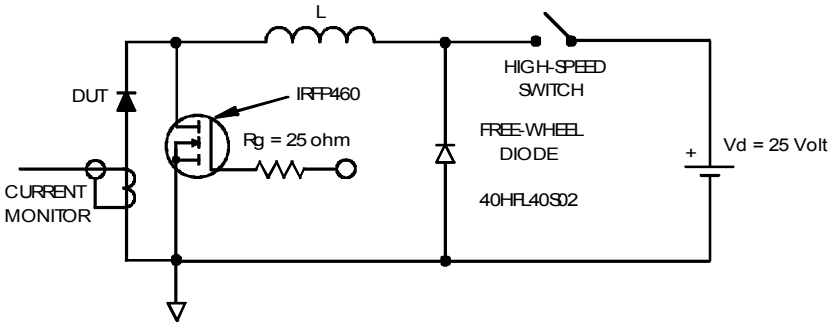
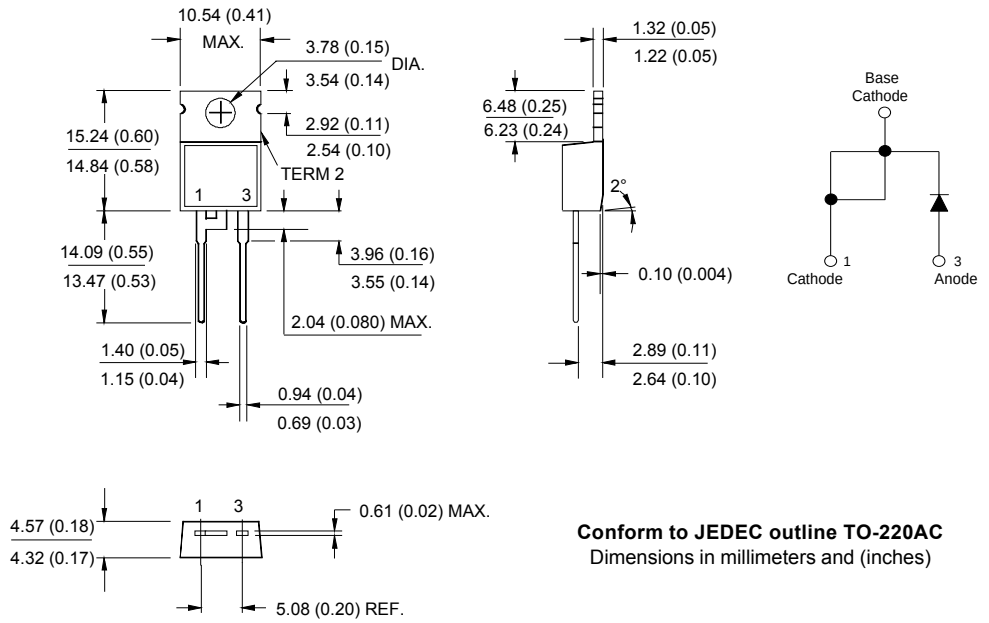


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



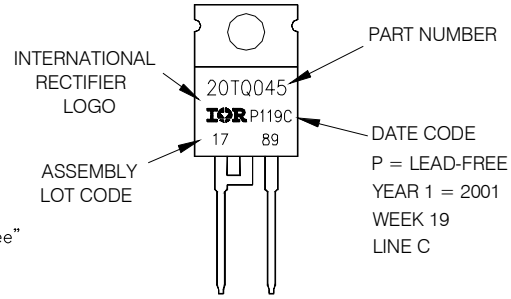
Conform to JEDEC outline TO-220AC
Dimensions in millimeters and (inches)

Part Marking Information

IRXC Assembly Line

EXAMPLE: THIS IS A 20TQ045
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"

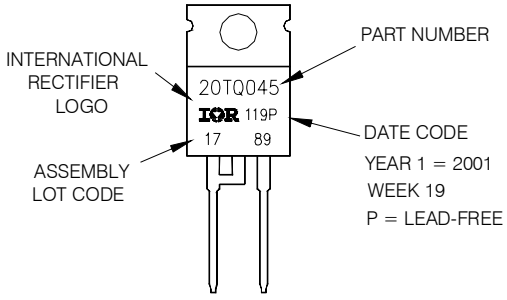
Note: "P" in the beginning of
date code indicates "Lead-Free"



IRMX Assembly Line

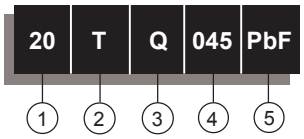
EXAMPLE: THIS IS A 20TQ045
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"

Note: "P" in assembly line
position indicates "Lead-Free"



Ordering Information Table

Device Code



1 - Current Rating (20 = 20A)

2 - Package
T = TO-220

3 - Schottky "Q" Series

4 - Voltage Ratings
- 035 = 35V
- 040 = 40V
- 045 = 45V

5 - • none = Standard Production
• PbF = Lead-Free

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
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