

Bulletin PD-20844 09/04

# International IOR Rectifier

## 20L15TPbF

### SCHOTTKY RECTIFIER

### 20 Amps

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

$$V_R = 15\text{V}$$

#### Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	20	A
$V_{RRM}$	15	V
$I_{FSM}$ @ $t_p = 5 \mu\text{s}$ sine	700	A
$V_F$ @ 19Apk, $T_J = 125^\circ\text{C}$ (Typical)	0.25	V
$T_J$ range	-55 to 125	$^\circ\text{C}$

#### Description/ Features

The Schottky rectifier module has been optimized for ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power sub-systems.

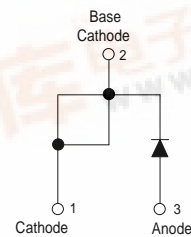
- 125°C  $T_J$  operation ( $V_R < 5\text{V}$ )
- Single diode configuration
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Lead-Free ("PbF" suffix)

#### Case Styles

20L15TPbF



TO-220AC



## 20L15TPbF

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International  
IR Rectifier

### Voltage Ratings

Part number	20L15TPbF	
$V_R$ Max. DC Reverse Voltage (V) @ $T_J = 100^\circ\text{C}$	15	
$V_{RWM}$ Max. Working Peak Reverse Voltage (V) @ $T_J = 100^\circ\text{C}$		

### Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	20	A	50% duty cycle @ $T_C = 85^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	700	A	Following any rated load condition and with rated $V_{RRM}$ applied
	330		
$E_{AS}$ Non-Repetitive Avalanche Energy	10	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 2$ Amps, $L = 6$ mH
$I_{AR}$ Repetitive Avalanche Current	2	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical

### Electrical Specifications

Parameters	Values		Units	Conditions	
	Typ.	Max.			
$V_{FM}$ Forward Voltage Drop * See Fig. 1 (1)	-	0.41	V	@ 19A	$T_J = 25^\circ\text{C}$
	-	0.52	V	@ 40A	
	0.25	0.33	V	@ 19A	$T_J = 125^\circ\text{C}$
	0.37	0.50	V	@ 40A	
$I_{RM}$ Reverse Leakage Current * See Fig. 2 (1)	-	10	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_R$
	-	600	mA	$T_J = 100^\circ\text{C}$	
$V_{F(TO)}$ Threshold Voltage	0.182		V	$T_J = T_J \text{ max.}$	
$r_t$ Forward Slope Resistance	7.6		m $\Omega$		
$C_T$ Max. Junction Capacitance	-	2000	pF	$V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$	
$L_S$ Typical Series Inductance	8	-	nH	Measured lead to lead 5mm from package body	
dv/dt Max. Voltage Rate of Change (Rated $V_R$ )	10,000		V/ $\mu\text{s}$		

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle <2%

### Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
$T_J$ Max. Junction Temperature Range	-55 to 125	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case	1.5	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
$R_{thCS}$ Typical Thermal Resistance Case to Heatsink	0.50	$^\circ\text{C}/\text{W}$	Mounting surface, smooth and greased For TO-220
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	40	$^\circ\text{C}/\text{W}$	DC operation For D <sup>2</sup> Pak
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min.	6 (5)	Non-lubricated threads
	Max.	12 (10)	
Marking Device	20L15T		

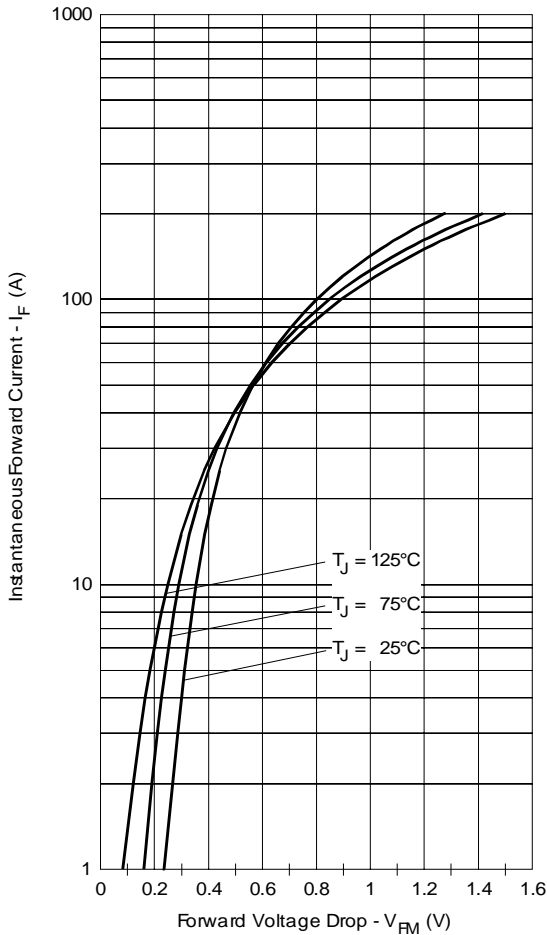


Fig. 1 - Maximum Forward Voltage Drop Characteristics

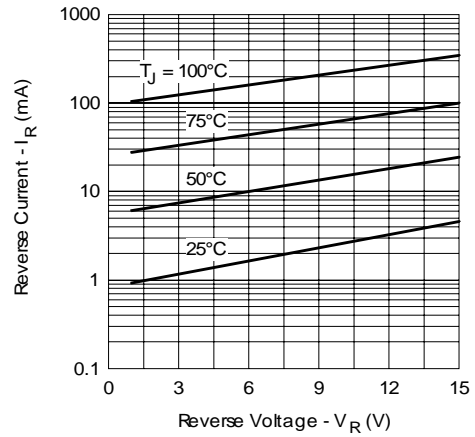


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

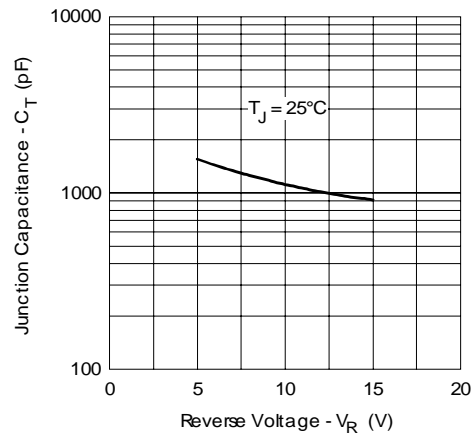


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

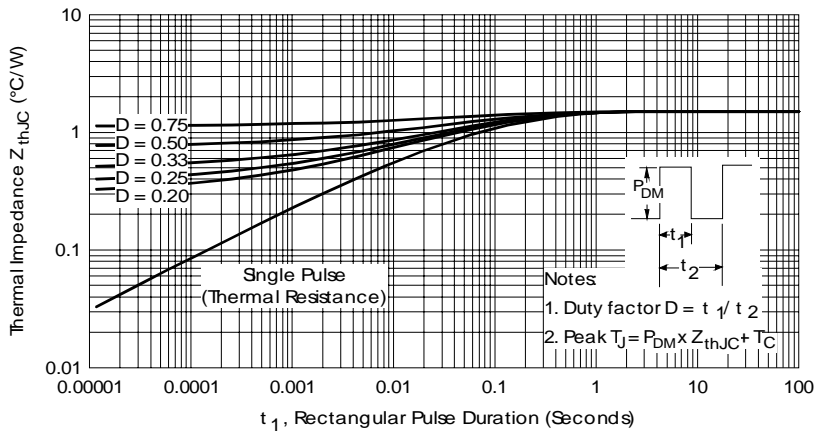


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

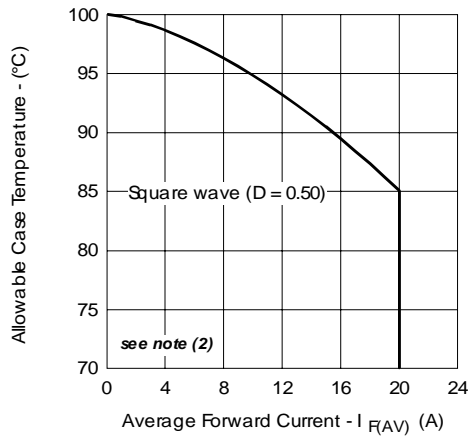


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

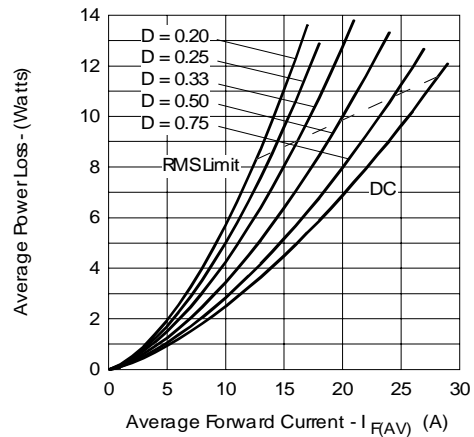


Fig. 6 - Forward Power Loss Characteristics

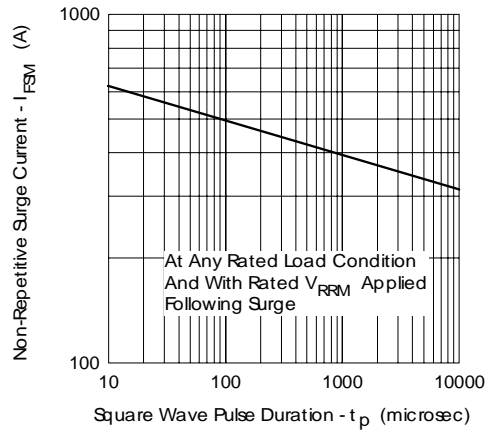


Fig. 7 - Maximum Non-Repetitive Surge Current

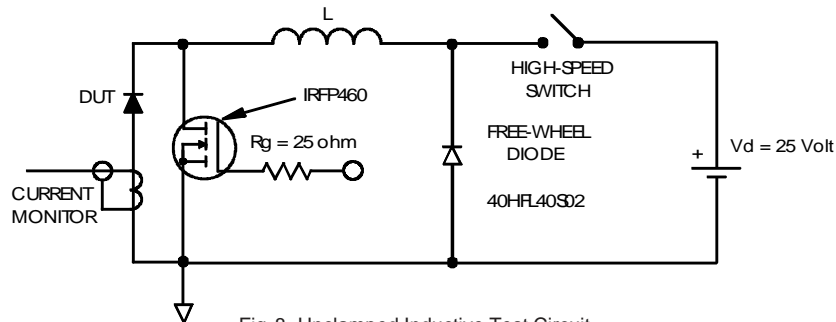
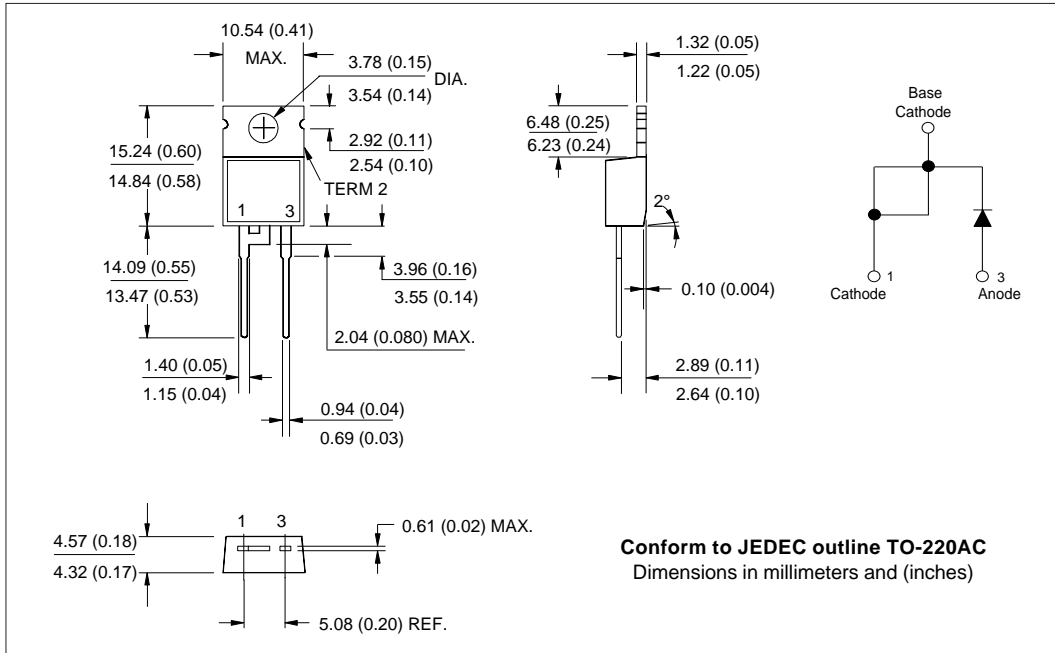


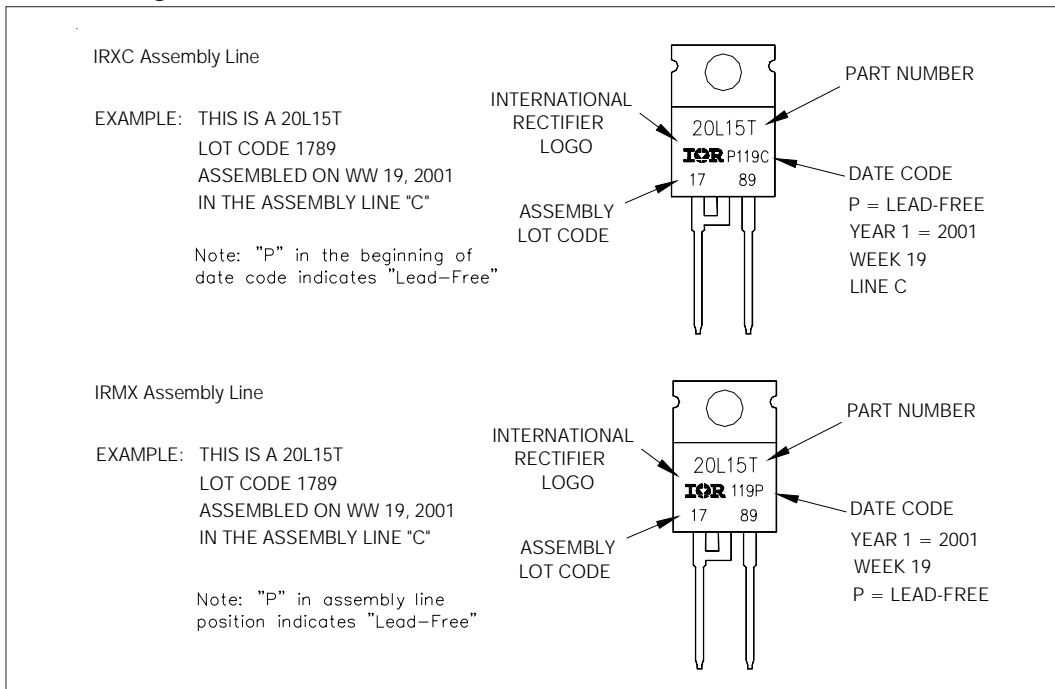
Fig. 8 - Unclamped Inductive Test Circuit

- (2) Formula used:  $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$ ;  
 $Pd =$  Forward Power Loss  $= I_{F(AV)} \times V_{FM} @ (I_{F(AV)}/D)$  (see Fig. 6);  
 $Pd_{REV} =$  Inverse Power Loss  $= V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 80\%$  rated  $V_R$

Outline Table



Part Marking Information



Ordering Information Table

Device Code											
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">20</td> <td style="padding: 5px;">L</td> <td style="padding: 5px;">15</td> <td style="padding: 5px;">T</td> <td style="padding: 5px;">PbF</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> </tr> </table>	20	L	15	T	PbF	①	②	③	④	⑤
20	L	15	T	PbF							
①	②	③	④	⑤							
<b>1</b>	- Current Rating (20 = 20A)										
<b>2</b>	- Schottky "L" Series										
<b>3</b>	- Voltage Code (15 = 15V)										
<b>4</b>	- Package T = TO-220										
<b>5</b>	- <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>										
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.