Bulletin PD-20844 09/04

International
IOR Rectifier

20L15TPbF

SCHOTTKY RECTIFIER

20 Amps

$I_{F(AV)}$ = 20Amp
V_R = 15V

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	20	A
V_{RRM}		15	V
I_{FSM}	@ tp = 5 µs sine	700	A
V_F	@ 19 Apk, T_J=125°C (Typical)	0.25	V
T_J	range	- 55 to 125	°C

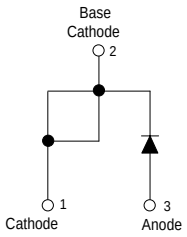
Description/ Features

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 subsystems.

- 125°C T_J operation (V_R < 5V)
- 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

Voltage Ratings

	Part number		20L15TPbF
V_R	Max. DC Reverse Voltage (V)	@ T_J = 100 °C	15
V_{RWM}	Max. Working Peak Reverse Voltage (V)	@ T_J = 100 °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°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	700	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	330		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	10	mJ	T_J = 25 °C, I_{AS} = 2 Amps, L = 6 mH	
I_{AR}	Repetitive Avalanche Current	2	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	Values		Units	Conditions	
		Typ.	Max.			
V_{FM}	Forward Voltage Drop	-	0.41	V	@ 19A	T_J = 25 °C
	* See Fig. 1 (1)	-	0.52	V	@ 40A	
		0.25	0.33	V	@ 19A	T_J = 125 °C
		0.37	0.50	V	@ 40A	
I_{RM}	Reverse Leakage Current	-	10	mA	T_J = 25 °C	V_R = rated V_R
	* See Fig. 2 (1)	-	600	mA	T_J = 100 °C	
$V_{F(TO)}$	Threshold Voltage	0.182		V	T_J = T_J max.	
r_t	Forward Slope Resistance	7.6		mΩ		
C_T	Max. Junction Capacitance	-	2000	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25°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/ µs		

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

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

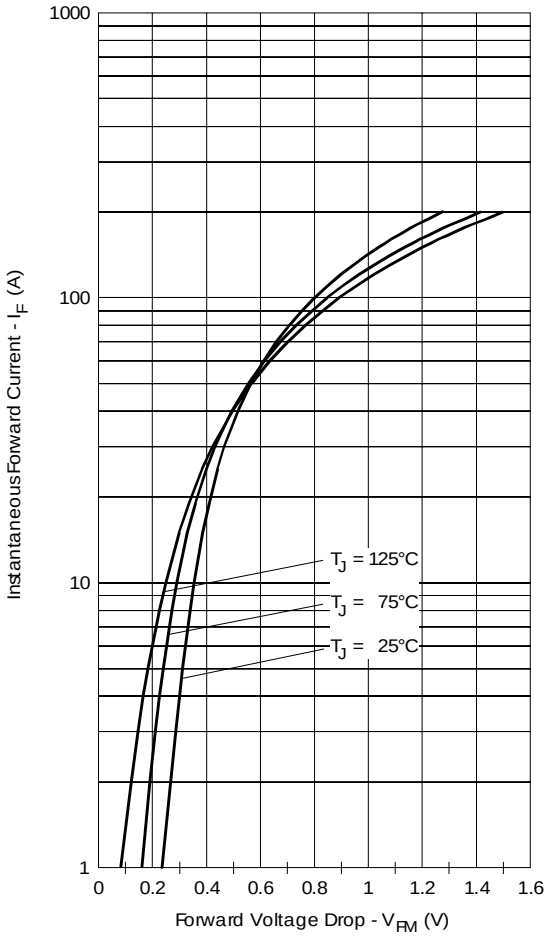


Fig. 1 - Maximum Forward Voltage Drop Characteristics

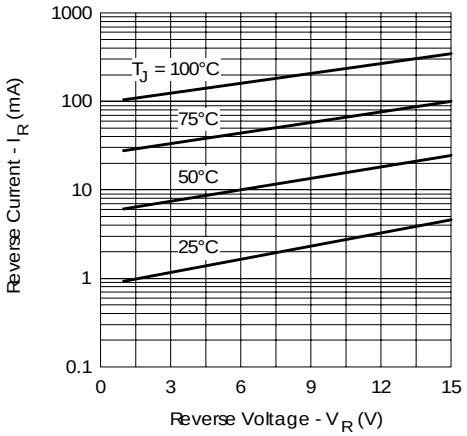


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

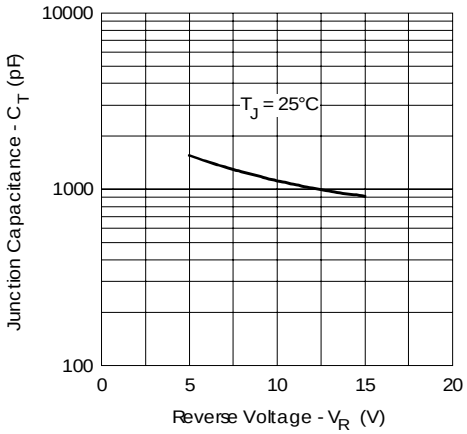


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

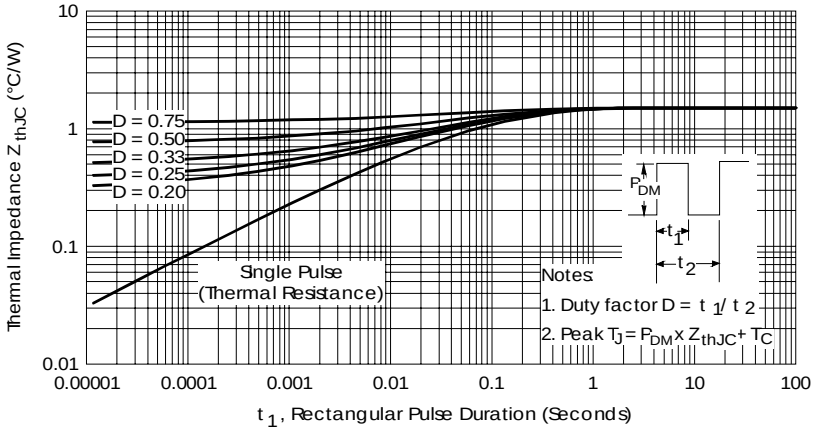


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

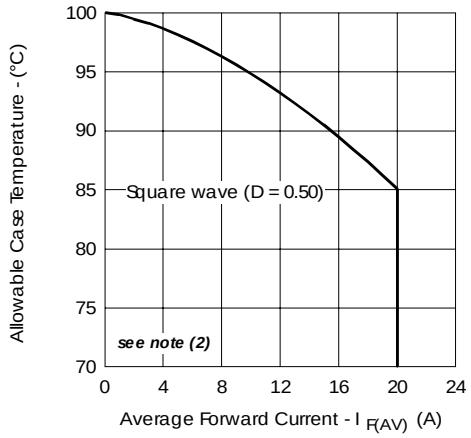


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

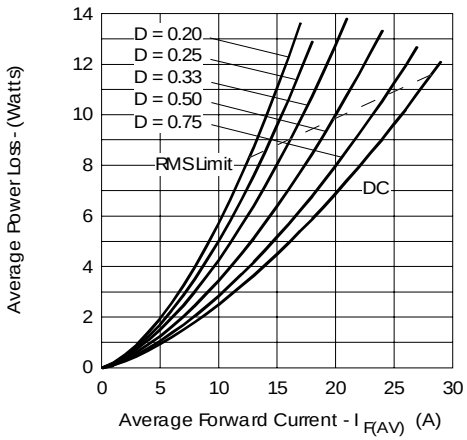


Fig. 6 - Forward Power Loss Characteristics

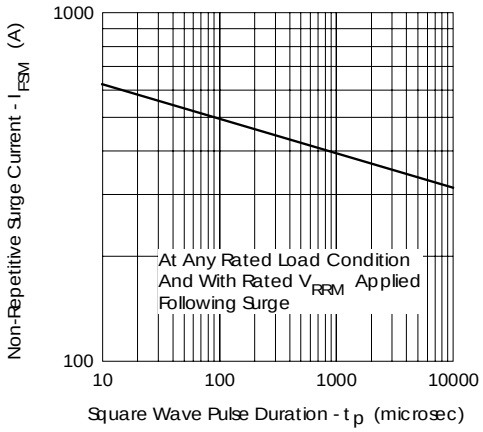


Fig. 7 - Maximum Non-Repetitive Surge Current

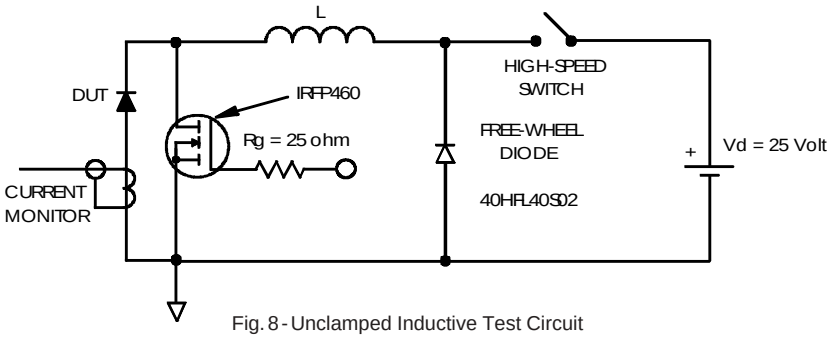
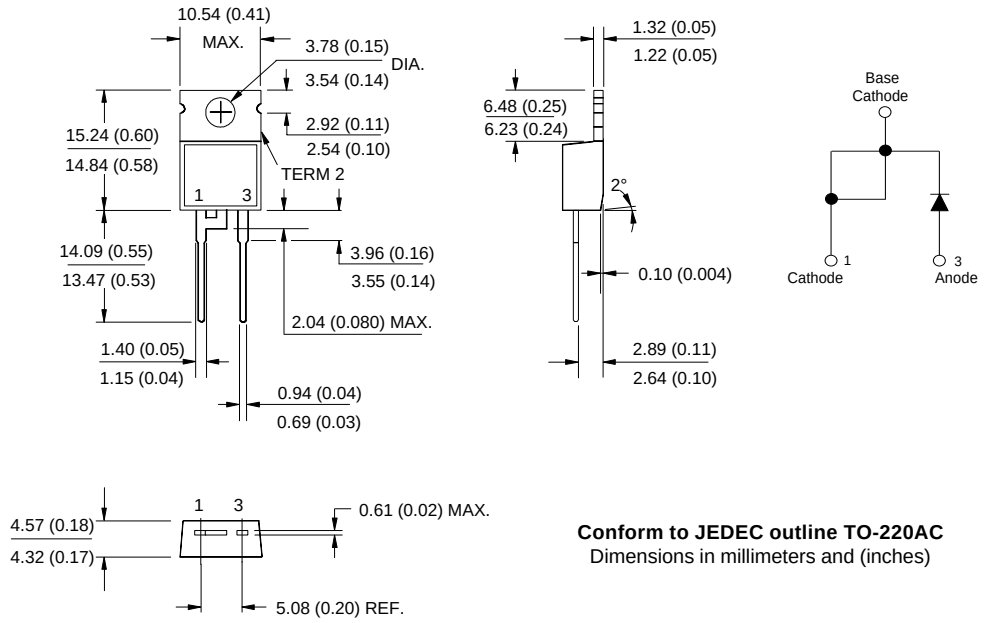


Fig. 8 - Unclamped Inductive Test Circuit

(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



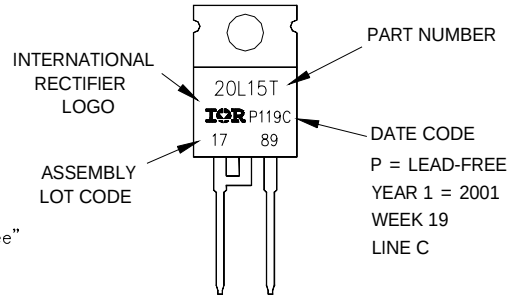
Conform to JEDEC outline TO-220AC
Dimensions in millimeters and (inches)

Part Marking Information

IRXC Assembly Line

EXAMPLE: THIS IS A 20L15T
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"

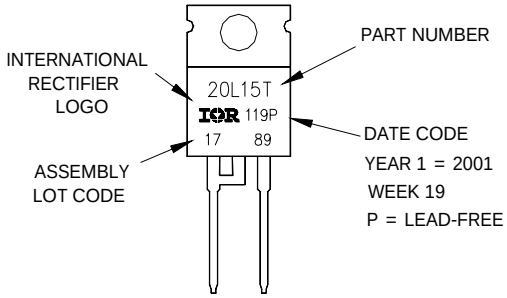
Note: "P" in the beginning of date code indicates "Lead-Free"



IRMX Assembly Line

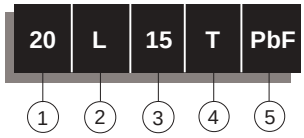
EXAMPLE: THIS IS A 20L15T
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"

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



Ordering Information Table

Device Code



1	-	Current Rating (20 = 20A)
2	-	Schottky "L" Series
3	-	Voltage Code (15 = 15V)
4	-	Package T = TO-220
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
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. 09/04