

Bulletin PD-21028 rev. B 06/06

# International IOR Rectifier

## 19TQ015SPbF

SCHOTTKY RECTIFIER

19 Amp

$$I_{F(AV)} = 19\text{Amp}$$

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

### Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	19	A
$V_{RRM}$	15	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	700	A
$V_F$ @ 19 Apk, $T_J = 75^\circ\text{C}$	0.32	V
$T_J$ range	-55 to 125	$^\circ\text{C}$

### Description/ Features

The 19TQ015 Schottky rectifier 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 $^\circ\text{C}$  junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- 125 $^\circ\text{C}$   $T_J$  operation ( $V_R < 5\text{V}$ )
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- High frequency operation
- 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



## Voltage Ratings

Part number	19TQ015PbF
$V_R$ Max. DC Reverse Voltage (V)	15
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	19TQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	19	A	50% duty cycle @ $T_C = 80^\circ\text{C}$ , 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 $V_{RWM}$ applied
	330		
$E_{AS}$ Non-Repetitive Avalanche Energy	6.75	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1.50$ Amps, $L = 6$ mH
$I_{AR}$ Repetitive Avalanche Current	1.50	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 3 \times V_R$ typical

## Electrical Specifications

Parameters	19TQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) * See Fig. 1	0.36	V	@ 19A $T_J = 25^\circ\text{C}$
	0.46	V	@ 38A
	0.32	V	@ 19A $T_J = 75^\circ\text{C}$
	0.43	V	@ 38A
$I_{RM}$ Max. Reverse Leakage Current (1) * See Fig. 2	10.5	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	522	mA	$T_J = 100^\circ\text{C}$
	465	mA	$T_J = 100^\circ\text{C}$ , $V_R = 12\text{V}$
	285	mA	$T_J = 100^\circ\text{C}$ , $V_R = 5\text{V}$
$C_T$ Max. Junction Capacitance	2000	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance	8.0	nH	Measured lead to lead 5mm from package body
$dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )	10000	V/ $\mu\text{s}$	

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

## Thermal-Mechanical Specifications

Parameters	19TQ	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	1.50	$^\circ\text{C}/\text{W}$	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
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)
	Max.	12 (10)	
Marking Device	19TQ015S		Case style D <sup>2</sup> Pak

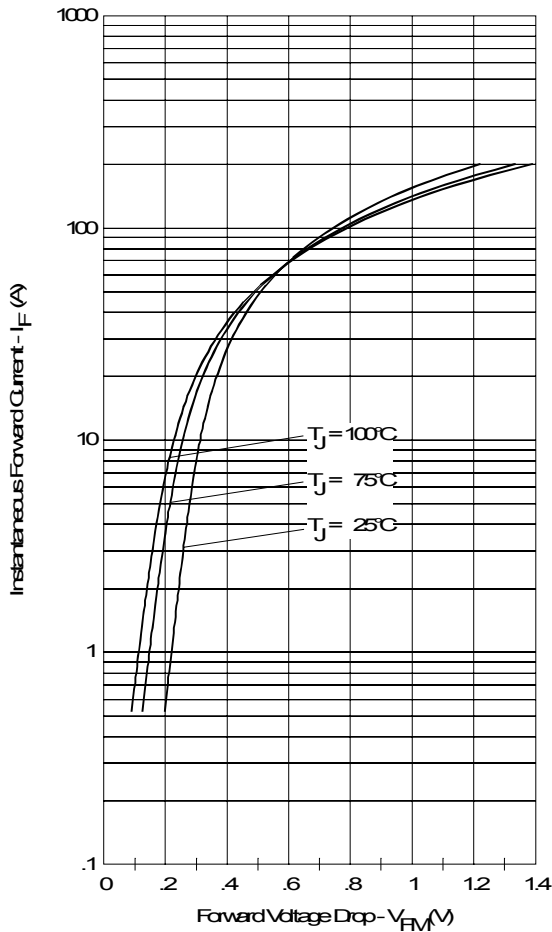


Fig. 1 - Maximum Forward Voltage Drop Characteristics

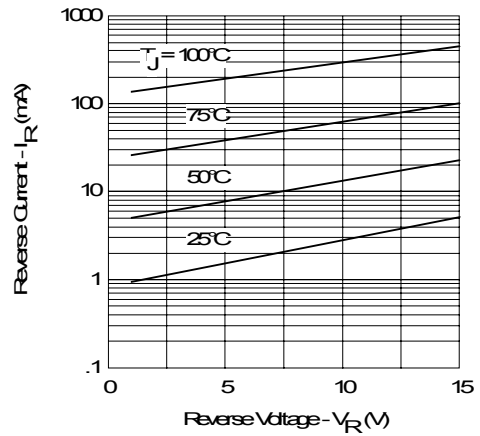


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

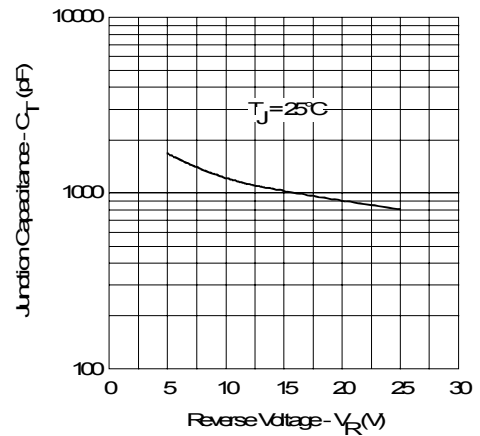


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

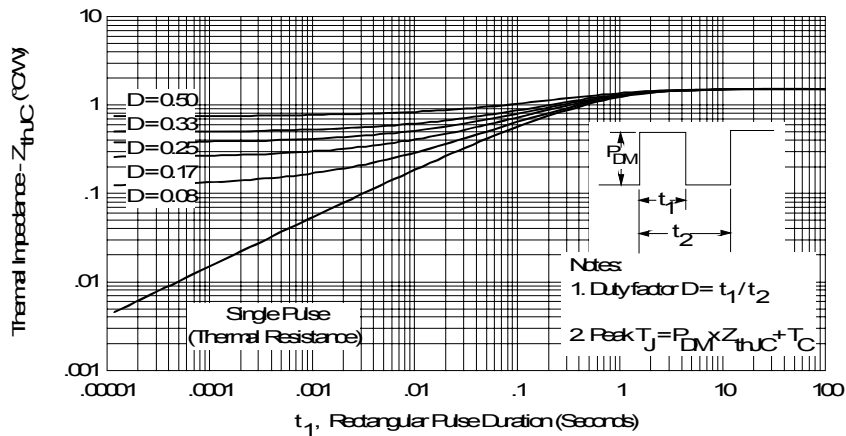


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

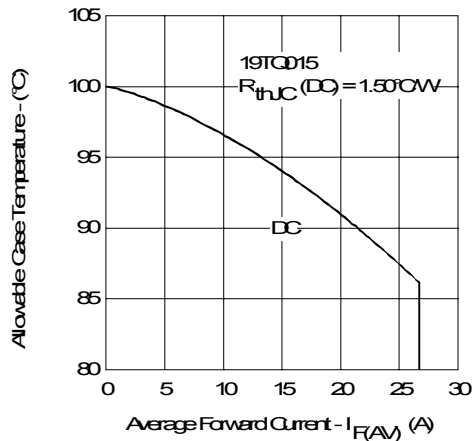


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

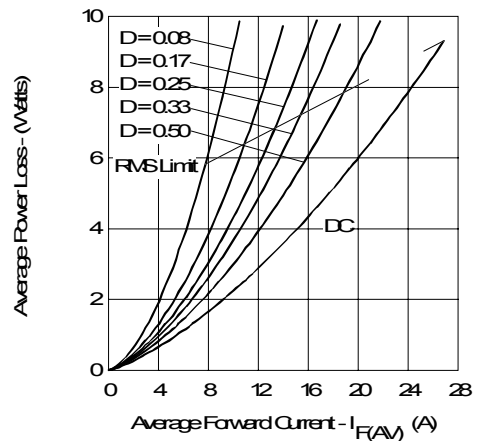


Fig. 6 - Forward Power Loss Characteristics

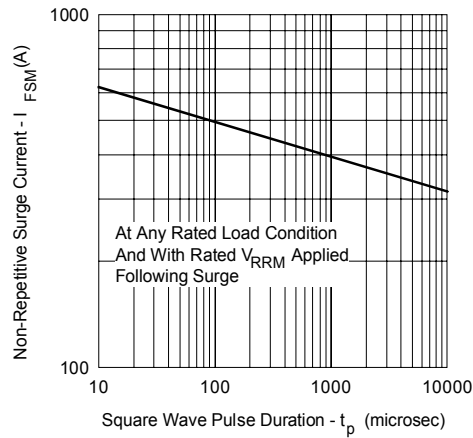


Fig. 7 - Maximum Non-Repetitive Surge Current

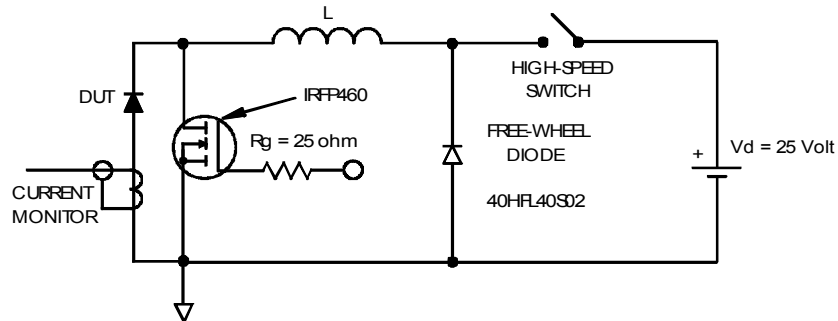


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994  
 2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].  
 3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [0.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.  
 4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.  
 5. CONTROLLING DIMENSIONS: INCH.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	4
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	4
b1	0.51	0.89	.020	.035	
b2	1.14	1.78	.045	.070	4
c	0.38	0.74	.015	.029	
c1	0.38	0.58	.015	.023	4
c2	1.14	1.65	.045	.065	
D	8.51	9.65	.335	.380	3
D1	6.86		.270		
E	9.65	10.67	.380	.420	3
E1	6.22		.245		
e	2.54	BSC	.100	BSC	3
H	14.61	15.88	.575	.625	
L	1.78	2.79	.070	.110	3
L1		1.65		.065	
L2	1.27	1.78	.050	.070	3
L3	0.25	BSC	.010	BSC	
L4	4.78	5.28	.188	.208	3
m	17.78		.700		
m1	8.89		.350		3
n	11.43		.450		
o	2.08		.082		3
p	3.81		.150		
R	0.51	0.71	.020	.028	3
θ	90°	93°	90°	93°	

**LEAD ASSIGNMENTS**

**HEXFET**  
 1.- GATE  
 2, 4.- DRAIN  
 3.- SOURCE

**IGBTs, CoPACK**  
 1.- GATE  
 2, 4.- COLLECTOR  
 3.- EMITTER

**DIODES**  
 1.- ANODE \*  
 2, 4.- CATHODE  
 3.- ANODE

\* PART DEPENDENT.

**Conform to JEDEC outline D<sup>2</sup>Pak (SMD-220)**  
 Dimensions in millimeters and (inches)

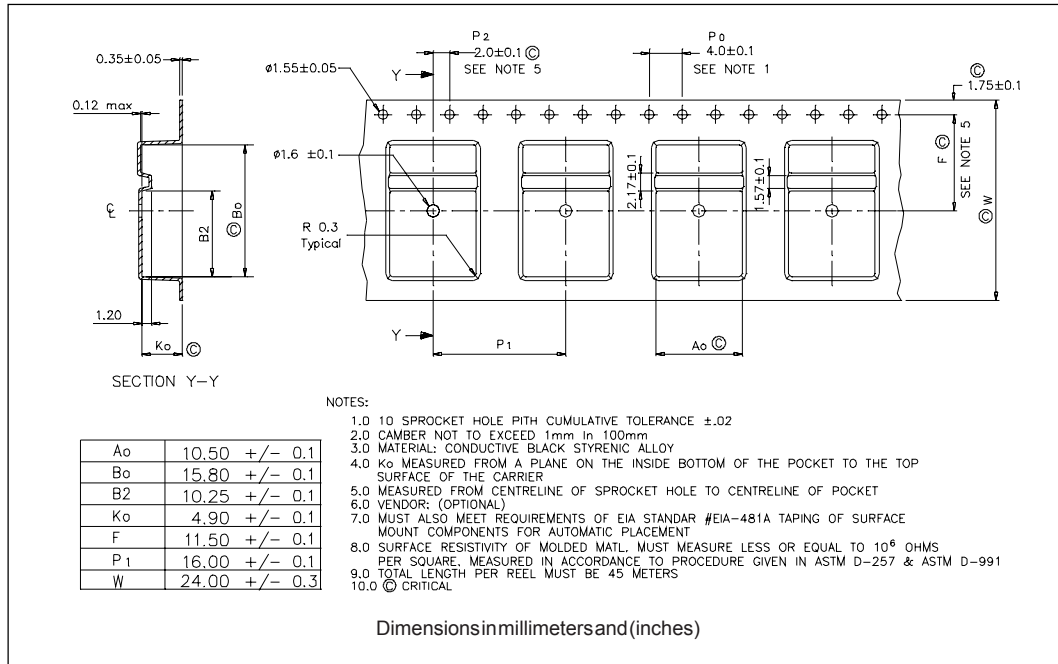
Part Marking Information

EXAMPLE: THIS IS A 19TQ015S  
 LOT CODE 8024  
 ASSEMBLED ON WW 02, 2000

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

INTERNATIONAL RECTIFIER LOGO  
 PART NUMBER  
 DATE CODE  
 YEAR 0 = 2000  
 WEEK 02  
 P = LEAD-FREE  
 ASSEMBLY LOT CODE

Tape & Reel Information



Ordering Information Table

Device Code	<b>19</b>	<b>T</b>	<b>Q</b>	<b>015</b>	<b>S</b>	<b>TRL</b>	<b>PbF</b>
	①	②	③	④	⑤	⑥	⑦
<b>1</b>	-	Current Rating (19A)					
<b>2</b>	-	Circuit Configuration					
		T = TO-220					
<b>3</b>	-	Schottky "Q" Series					
<b>4</b>	-	Voltage Rating (015 = 15V)					
<b>5</b>	-	• S = D <sup>2</sup> Pak					
<b>6</b>	-	• none = Tube (50 pieces)					
		• TRL = Tape & Reel (Left Oriented)					
		• TRR = Tape & Reel (Right Oriented)					
<b>7</b>	-	• none = Standard Production					
		• PbF = Lead-Free					

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

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