Bulletin PD-20782 07/04

International
IOR Rectifier

10BQ015PbF

SCHOTTKY RECTIFIER 1 Amp

$I_{F(AV)}$ = 1.0Amp
V_R = 15V

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	1.0	A
V_{RRM}		15	V
I_{FSM}	@tp = 5 µs sine	140	A
V_F	@1.0 Apk, T_J=125°C	0.32	V
T_J	range	- 55 to 125	°C

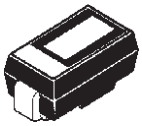
Description/ Features

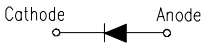
The 10BQ015PbF surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. The proprietary barrier technology allows for reliable operation up to 125°C junction temperature. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- 125°C T_J operation (V_R < 5V)
- 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

10BQ015PbF





SMB

Voltage Ratings

	Part number	10BQ015PbF
V_R	Max. DC Reverse Voltage (V)	15
V_{RWM}	Max. Working Peak Reverse Voltage (V)	25

Absolute Maximum Ratings

	Parameters	10BQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 5	1.0	A	50% duty cycle @ T_L = 84 °C, rectangular wave form.	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	140	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		40		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	1.0	mJ	T_J = 25 °C, I_{AS} = 1A, L = 2mH	
I_{AR}	Repetitive Avalanche Current	1.0	A	Current decayng linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	10BQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1) * See Fig. 1	0.35	V	@ 1.0A	T_J = 25 °C
		0.44	V	@ 2.0A	
		0.32	V	@ 1.0A	T_J = 125 °C
		0.40	V	@ 2.0A	
I_{RM}	Max. Reverse Leakage Current (1) * See Fig. 2	0.5	mA	T_J = 25 °C	V_R = rated V_R
		12	mA	T_J = 100 °C	
$V_{F(TO)}$	Threshold Voltage	-	V	T_J = T_J max.	
r_t	Forward Slope Resistance	-	mΩ		
C_T	Typical Junction Capacitance	390	pF	V_R = 5V_{DC}, (test signal range 100KHz to 1MHz) 25°C	
L_S	Typical Series Inductance	2.0	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change	10000	V/µs	(Rated V_R)	

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

Thermal-Mechanical Specifications

	Parameters	10BQ	Units	Conditions
T_J	Max. Junction Temperature Range (*)	-55 to 125	°C	
T_{stg}	Max. Storage Temperature Range	-55 to 150	°C	
R_{thJL}	Max. Thermal Resistance Junction to Lead (**)	36	°C/W	DC operation (See Fig. 4)
R_{thJA}	Max. Thermal Resistance Junction to Ambient	80	°C/W	DC operation
wt	Approximate Weight	0.10 (0.003)	g (oz.)	
	Case Style	SMB		Similar to DO-214AA
	Device Marking	IR1C		

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

(**) Mounted 1 inch square PCB

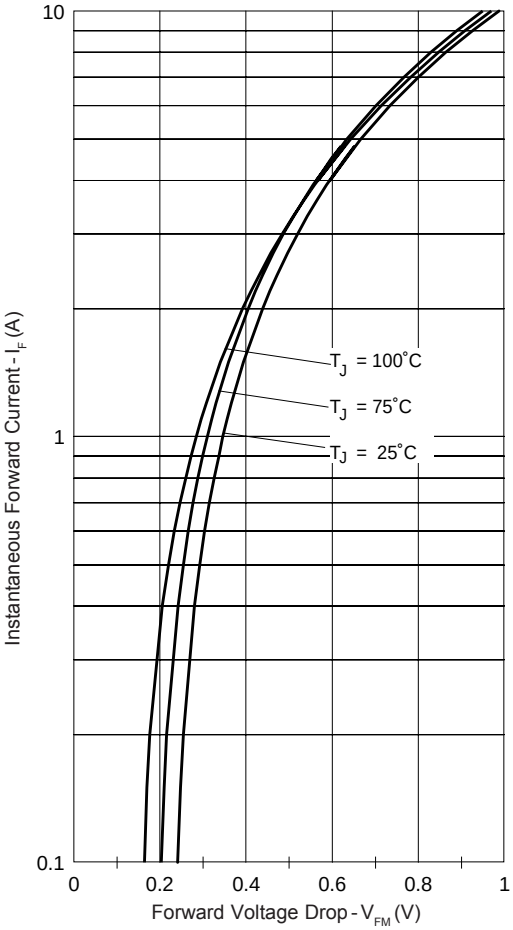


Fig. 1 - Max. Forward Voltage Drop Characteristics

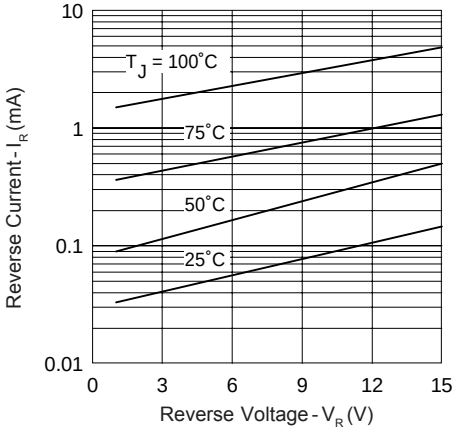


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

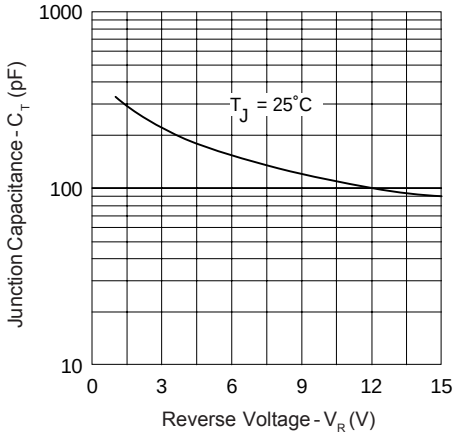


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

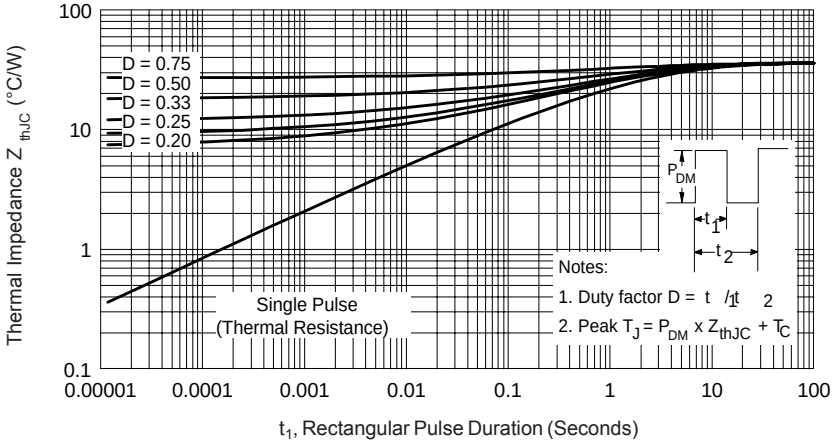


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

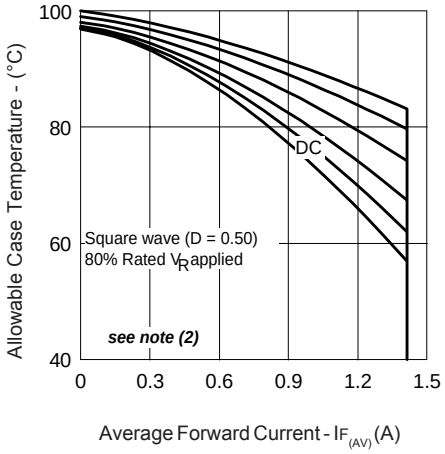


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

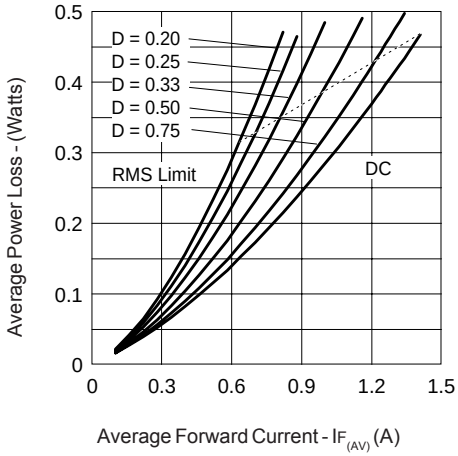


Fig. 6 - Forward Power Loss Characteristics

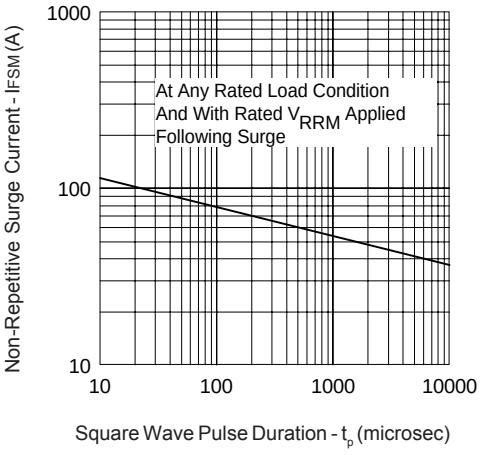
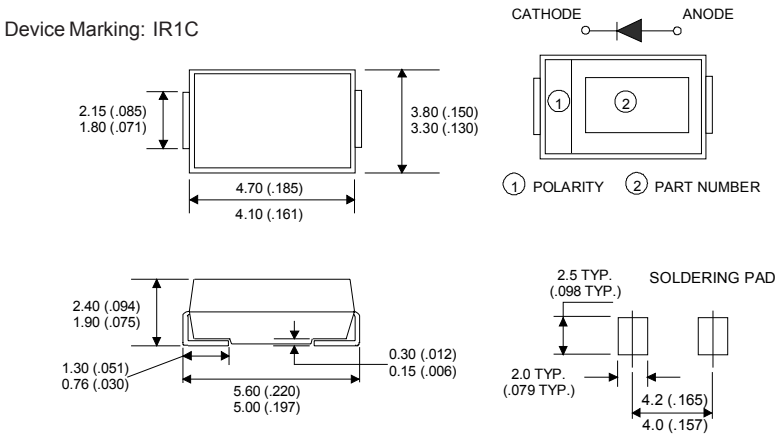


Fig. 7 - Max. Non-Repetitive Surge Current

(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



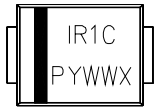
Outline SMB

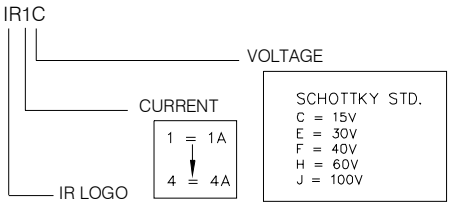
Dimensions in millimeters and (inches)

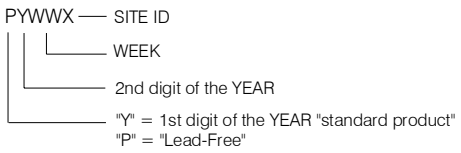
For recommended footprint and soldering techniques refer to application note #AN-994

Marking & Identification

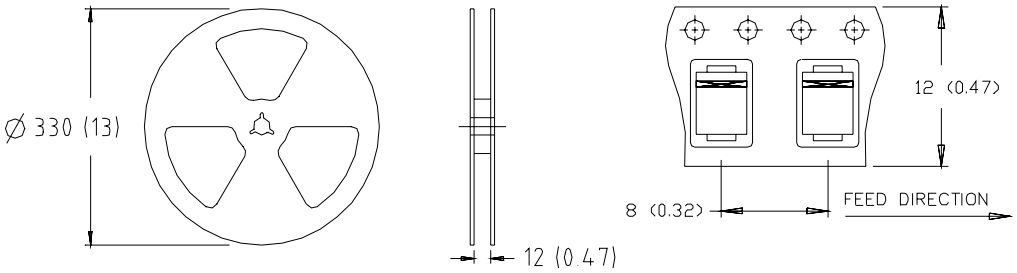
Each device has 2 rows for identification. The first row designates the device as manufactured by International Rectifier, indicated by the letters "IR", and the Part Number (indicates the current, the voltage rating and Schottky Generation). The second row indicates the year, the week of manufacturing and the Site ID.







Tape & Reel Information



Dimensions in millimetres and (inches)

Ordering Information Table

Device Code

10	B	Q	015	TR	PbF
1	2	3	4	5	6

1	-	Current Rating
2	-	B = Single Lead Diode
3	-	Q = Schottky Q Series
4	-	Voltage Rating (015 = 15V)
5	-	• none = Box (1000 pieces)
		• TR = Tape & Reel (3000 pieces)
6		• 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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07/04

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