



## 0.5 Amp To 2 Amp Fast Recovery Glass Rectifiers

### DESCRIPTION

This miniature, fast recovery rectifier diode series permits operation at frequencies as high as a 40 kHz square wave. These devices are axial equivalents of the 1N5615US - 1N5623US MELF surface mount series.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- Miniature voidless hermetically sealed glass package.
- Continuous current rating to 2 amps.
- Extremely robust construction.
- Internal “Category 1” metallurgical bonds.
- RoHS compliant versions available.

### APPLICATIONS / BENEFITS

- Fast recovery 0.5 amp to 2 amp rectifier series with  $V_{RWM}$  range from 50 to 600 V with 40 kHz operation.
- Switching power supplies or other applications requiring extremely fast switching & low forward loss.
- Surge rated to 25 amps.
- Low thermal resistance.
- Controlled avalanche with peak reverse power capability.
- Inherently radiation hard as described in Microsemi [MicroNote 050](#).

### MAXIMUM RATINGS @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Parameters/Test Conditions	Symbol	Value	Unit
Junction Temperature	$T_J$	-65 to +175	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-65 to +200	$^\circ\text{C}$
Thermal Resistance Junction-to-Lead (L = .375 in)	$R_{\theta JL}$	See <a href="#">Derating Curves</a>	
Working Peak Reverse Voltage: <b>½ Amp, 1 Amp, 2 Amp</b>	$V_{RWM}$		V
UTR01, UTR02		50	
UTR10, UTR11, UTR12		100	
UTR20, UTR21, UTR22		200	
UTR30, UTR31, UTR32		300	
UTR40, UTR41, UTR42		400	
UTR50, UTR51, UTR52		500	
UTR60, UTR61, UTR62	600		
Forward Surge Current (Peak) @ 8.3 ms	$I_{FSM}$	½ Amp Series	A
		1 Amp Series	
		2 Amp Series	
Average Rectified Output Current @ $T_L = +25^\circ\text{C}$	$I_{O1}$	½ Amp Series	A
		1 Amp Series	
		2 Amp Series	
Average Rectified Output-Current @ $T_A = +100^\circ\text{C}$	$I_{O2}$	½ Amp Series	A
		1 Amp Series	
		2 Amp Series	
Solder Temperature @ 10 s	$T_{SP}$	260	$^\circ\text{C}$



“A” Package

#### MSC – Lawrence

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#### MSC – Ireland

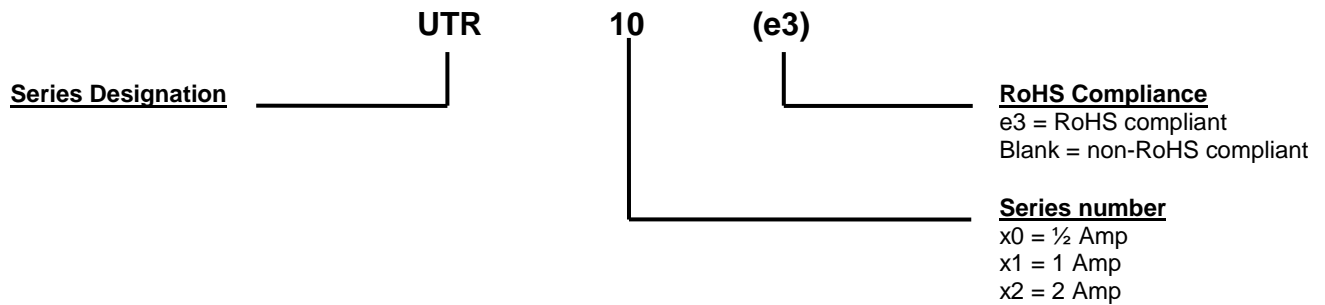
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Ennis, Co. Clare, Ireland  
Tel: +353 (0) 65 6840044  
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#### Website:

[www.microsemi.com](http://www.microsemi.com)

**MECHANICAL and PACKAGING**

- CASE: Hermetically sealed voidless hard glass with tungsten slugs.
- TERMINALS: Tin/lead or RoHS compliant matte/tin over nickel plate over copper.
- MARKING: Green band indicates “UTR”, part number printed on body.
- POLARITY: Indicated by green band.
- TAPE & REEL option: Standard per EIA-296. Consult factory for quantities.
- WEIGHT: Approximately 0.26 grams.
- See [Package Dimensions](#) on last page.

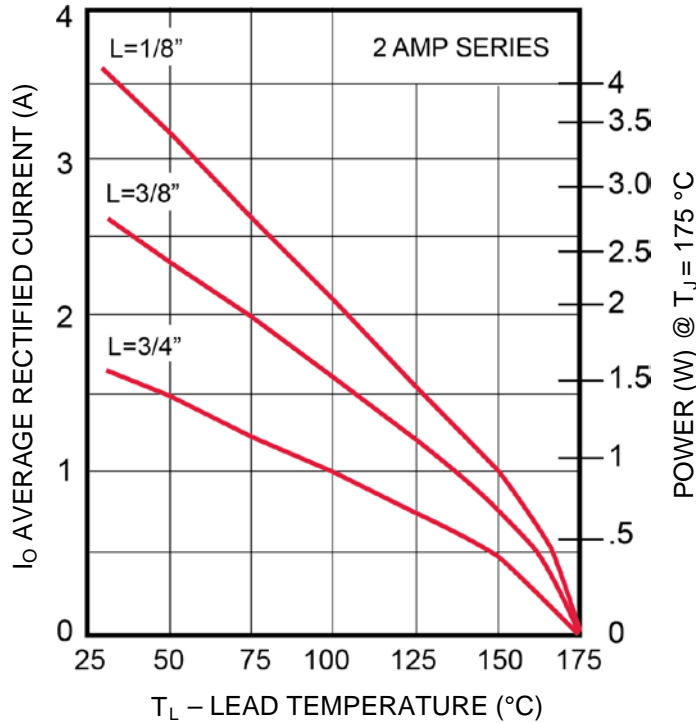
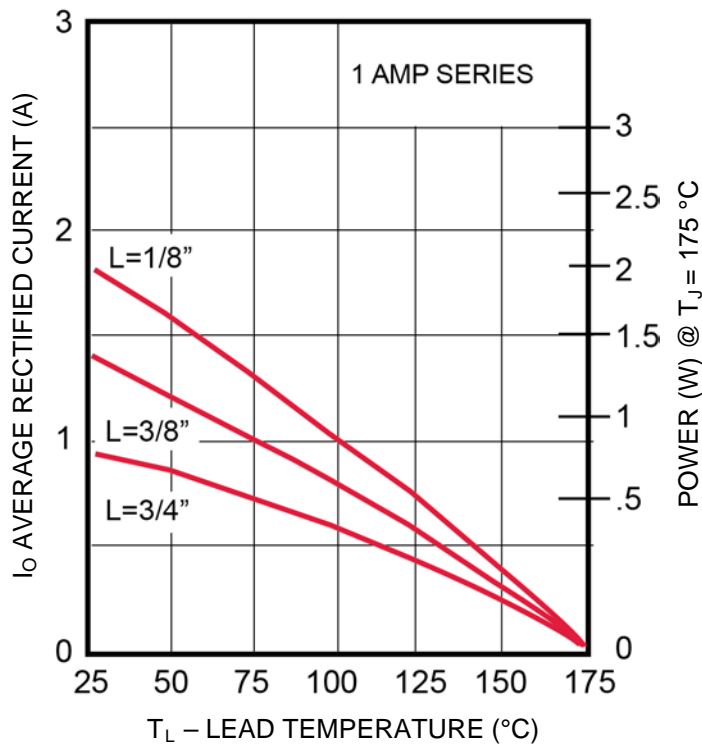
**PART NOMENCLATURE**

**SYMBOLS & DEFINITIONS**

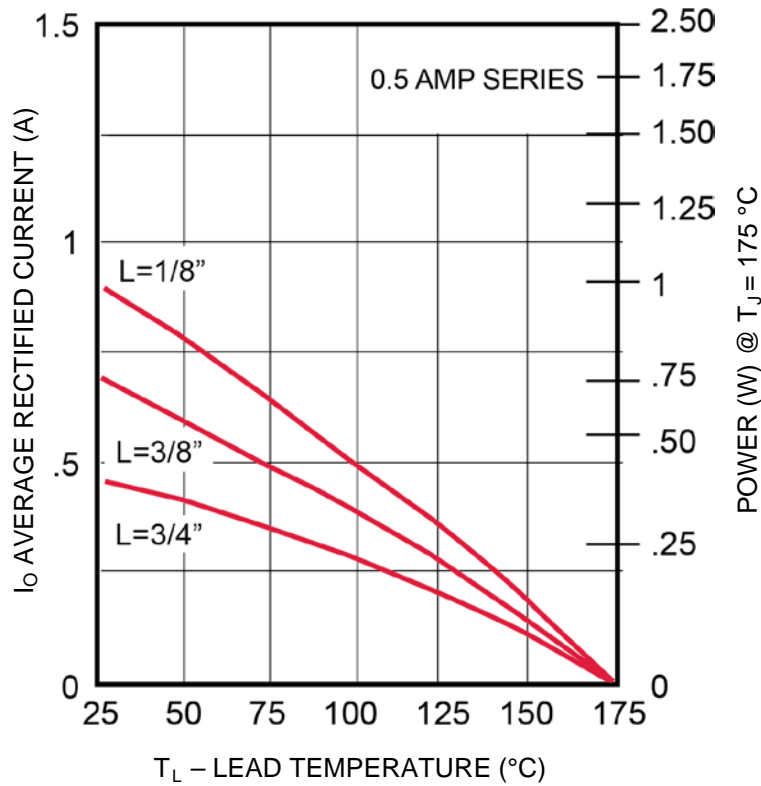
Symbol	Definition
$V_{RWM}$	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range.
$I_O$	Average Rectified Output Current: Output current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
$V_F$	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
$I_R$	Maximum Leakage Current: The maximum leakage current that will flow at the specified voltage and temperature.
$C_J$	Junction Capacitance: The junction capacitance in pF at a specified frequency (typically 1 MHz) and specified voltage.
$t_{rr}$	Reverse Recovery Time: The time interval between the instant the current passes through zero when changing from the forward direction to the reverse direction and a specified recovery decay point after a peak reverse current occurs.

**ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise noted**

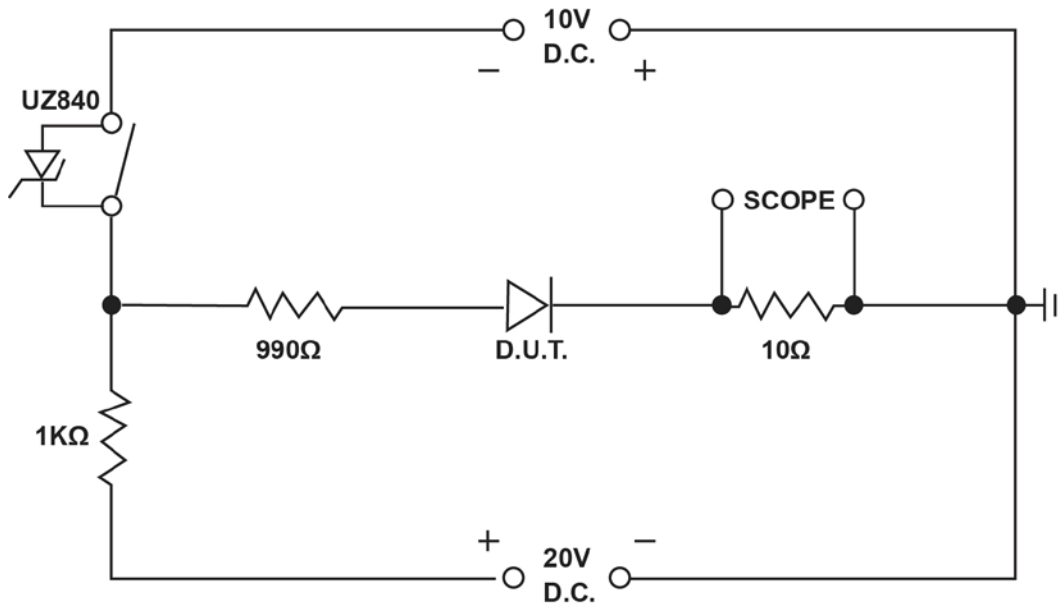
TYPE	WORKING PEAK REVERSE VOLTAGE $V_{RWM}$	MAXIMUM FORWARD VOLTAGE DROP $V_F$	MAXIMUM LEAKAGE CURRENT @ $V_{RWM}$		REVERSE RECOVERY TIME (MAX) $t_{rr}$ (Note 1)	MAXIMUM JUNCTION CAPACITANCE $C_J$ @ 25°C	
	Volts	Volts	$\mu A$		ns	pF	
			25 °C	100 °C		0 V	-10 V
UTR02	50	1.1 V @ 1000 mA	3	100	250	150	60
UTR12	100				250	100	40
UTR22	200				250	80	32
UTR32	300				300	70	28
UTR42	400				350	60	24
UTR52	500				400	50	20
UTR62	600				400	40	16
UTR01	50	1.1 V @ 500 mA	3	100	250	150	60
UTR11	100				250	100	40
UTR21	200				250	80	32
UTR31	300				300	70	28
UTR41	400				350	60	24
UTR51	500				400	50	20
UTR61	600				400	40	16
UTR10	100	1.1 V @ 200 mA	3	100	250	100	40
UTR20	200				250	80	32
UTR30	300				300	70	28
UTR40	400				350	60	24
UTR50	500				400	50	20
UTR60	600				400	40	16

**NOTES:** 1. Recovery time is measured from 10.0 mA to 10.0 mA recovery to 5.0 mA.

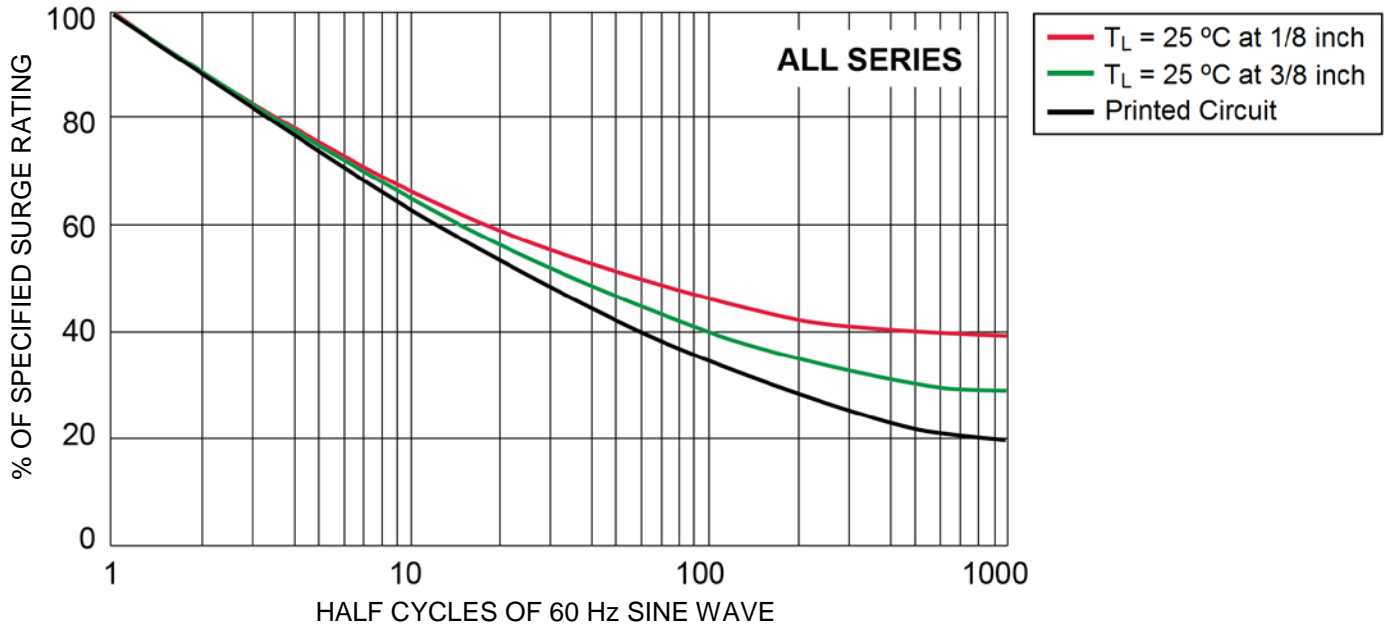
**GRAPHS**

**FIGURE 1**
Maximum Current vs Lead Temperature

**FIGURE 2**
Maximum Current vs Lead Temperature

**GRAPHS**


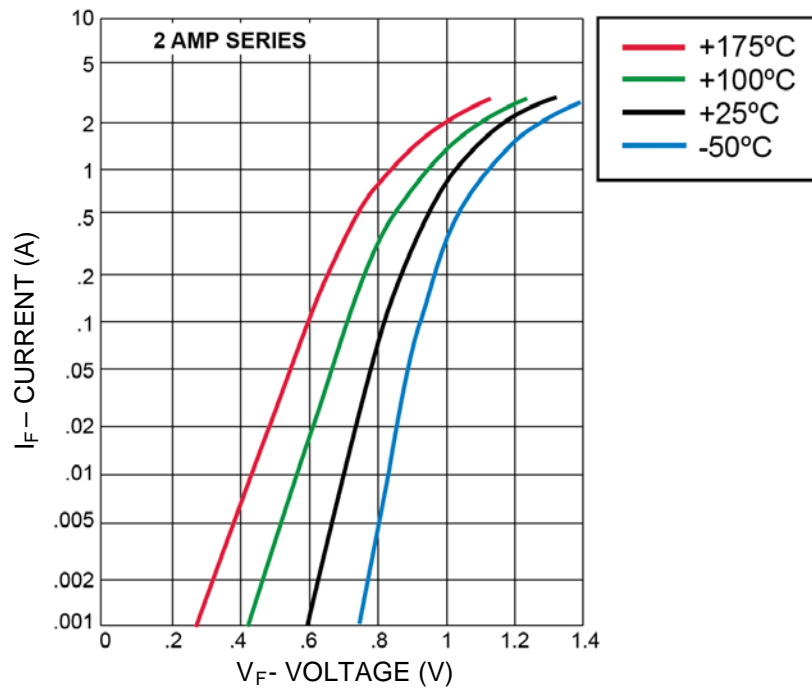
**FIGURE 3**  
Maximum Current vs Lead Temperature



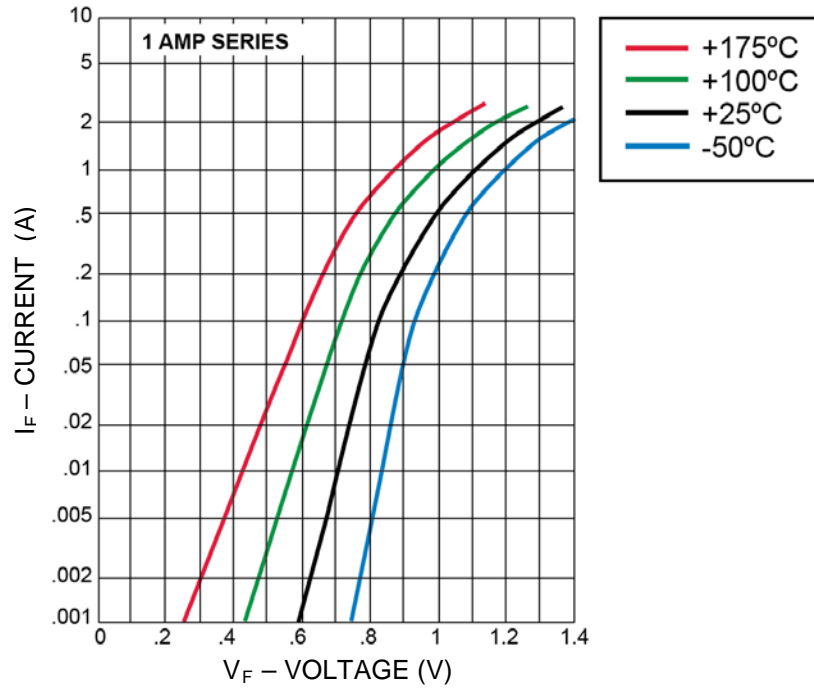
**FIGURE 4**  
Reverse-Recovery Circuit

**GRAPHS**


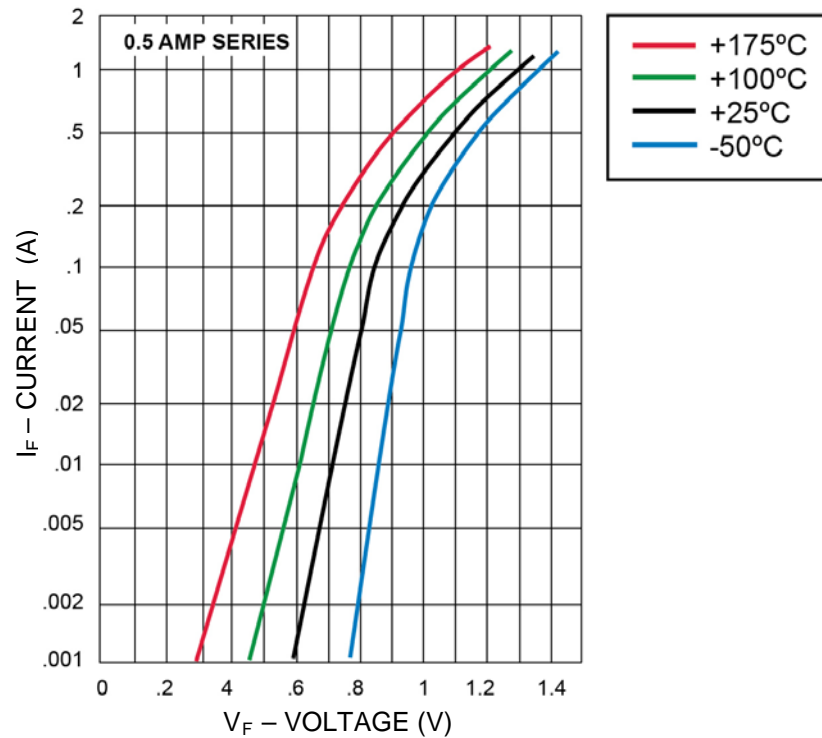
**FIGURE 5**  
Allowable Forward Surge vs Number of Cycles



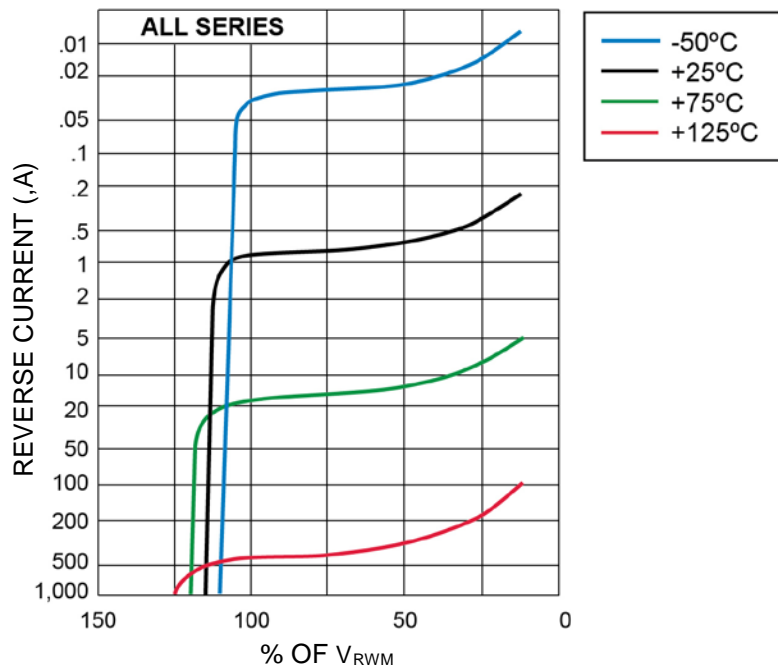
**FIGURE 6**  
Typical Forward Current vs Forward Voltage

**GRAPHS**


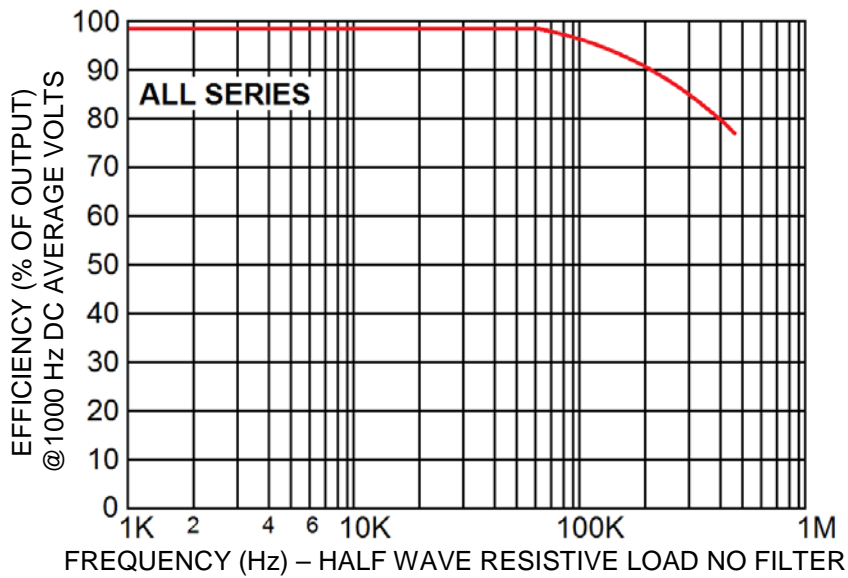
**FIGURE 7**  
Typical Forward Current vs Forward Voltage



**FIGURE 8**  
Typical Forward Current vs Forward Voltage

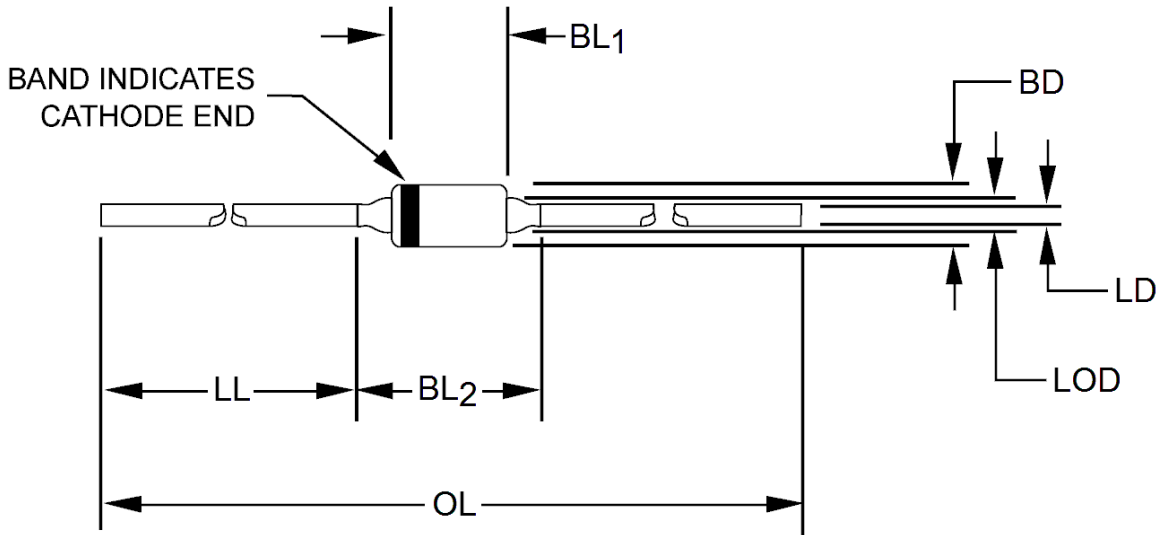
**GRAPHS**


**FIGURE 9**  
Typical Reverse Current vs Working Peak Reverse Voltage



**FIGURE 10**  
Efficiency vs Frequency at Rated Current (Sine Wave)



**PACKAGE DIMENSIONS**

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimension  $BL_2$  shall include the entire body including slugs and sections of the lead over which the diameter is uncontrolled. This uncontrolled area is defined as the zone between the edge of the diode body and extending .050 inch (1.27 mm) onto the leads.
4. Dimension  $BD$  shall be measured at the largest diameter.
5. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.

Ltr	DIMENSIONS				Notes
	INCH		MILLIMETERS		
	Min	Max	Min	Max	
<b>BD</b>	0.065	0.085	1.65	2.16	4
<b>BL<sub>1</sub></b>	0.155 TYP		3.9 TYP		
<b>BL<sub>2</sub></b>	0.125	0.250	3.18	6.35	3
<b>LD</b>	0.027	0.032	0.69	0.81	3
<b>LL</b>	0.700	1.30	17.78	33.02	
<b>LOD</b>	0.055 TYP		1.4 TYP		
<b>OL</b>	1.625	--	41.3	--	