



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 Derating Curves	
Working Peak Reverse Voltage: ½ Amp, 1 Amp, 2 Amp	V_{RWM}	50 100 200 300 400 500 600	V
UTR01, UTR02			
UTR10, UTR11, UTR12			
UTR20, UTR21, UTR22			
UTR30, UTR31, UTR32			
UTR40, UTR41, UTR42			
UTR50, UTR51, UTR52			
UTR60, UTR61, UTR62			
Forward Surge Current (Peak) @ 8.3 ms	I_{FSM}	15 20 25	A
Average Rectified Output Current @ $T_L = +25^\circ\text{C}$	I_{O1}	0.5 1.0 2.0	A
Average Rectified Output-Current @ $T_A = +100^\circ\text{C}$	I_{O2}	0.25 0.5 1.0	A
Solder Temperature @ 10 s	T_{SP}	260	$^\circ\text{C}$



"A" Package

MSC – Lawrence

6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland

Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:

www.microsemi.com

- 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.

The diagram illustrates the structure of the 10(e3) UTR series designation. It shows a horizontal line with a vertical line extending upwards from its center, labeled '10' above it. To the right of this vertical line, there is a horizontal line segment labeled '(e3)' above it. Further to the right, there is a vertical line extending upwards from the horizontal line, labeled 'UTR' above it. To the left of the main horizontal line, there is a label 'Series Designation' with a line pointing to the start of the horizontal line. To the right of the '(e3)' label, there is a label 'RoHS Compliance' with a line pointing to the horizontal line segment, and below it, 'e3 = RoHS compliant' and 'Blank = non-RoHS compliant'. To the right of the 'UTR' label, there is a label 'Series number' with a line pointing to the vertical line, and below it, 'x0 = 1/2 Amp', 'x1 = 1 Amp', and 'x2 = 2 Amp'.

Series Designation

UTR

10

(e3)

RoHS Compliance
e3 = RoHS compliant
Blank = non-RoHS compliant

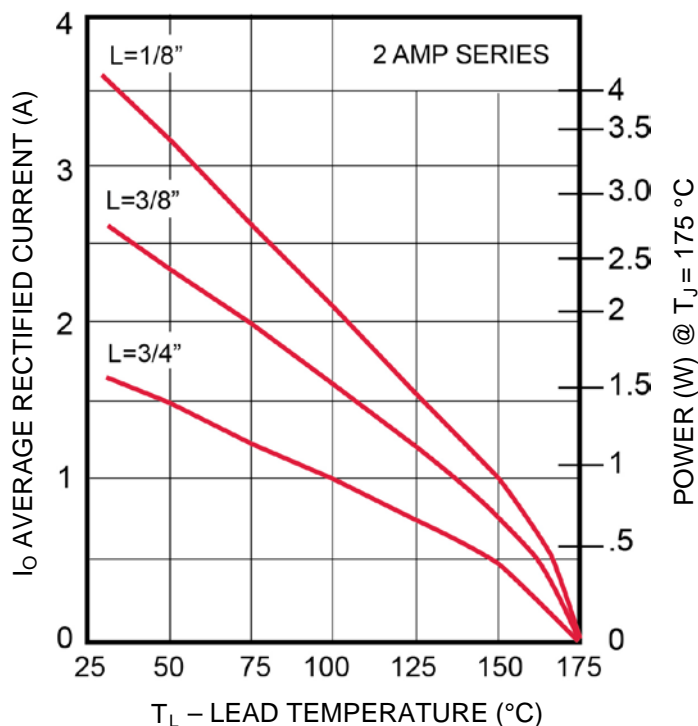
Series number
x0 = 1/2 Amp
x1 = 1 Amp
x2 = 2 Amp

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.

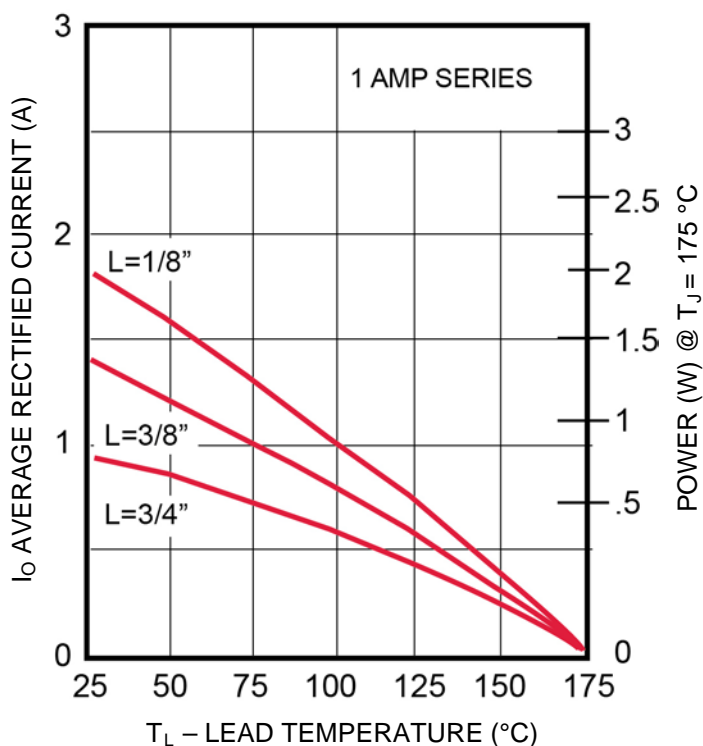
ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise noted

	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	
TYPE	Volts	Volts	μA		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

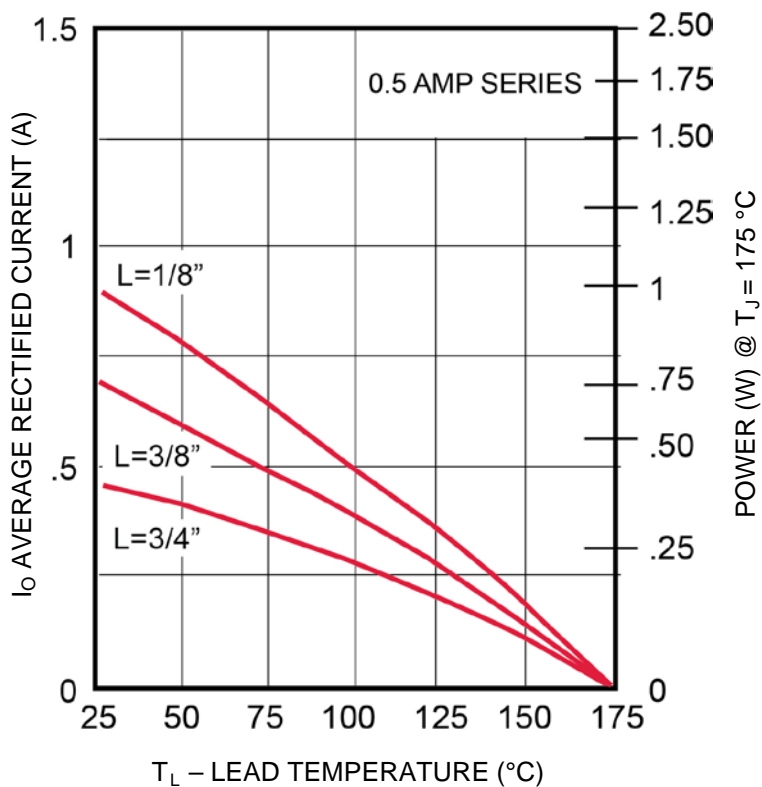
NOTES: 1. Recovery time is measured from 10.0 mA to 10.0 mA recovery to 5.0 mA.

GRAPHS

FIGURE 1

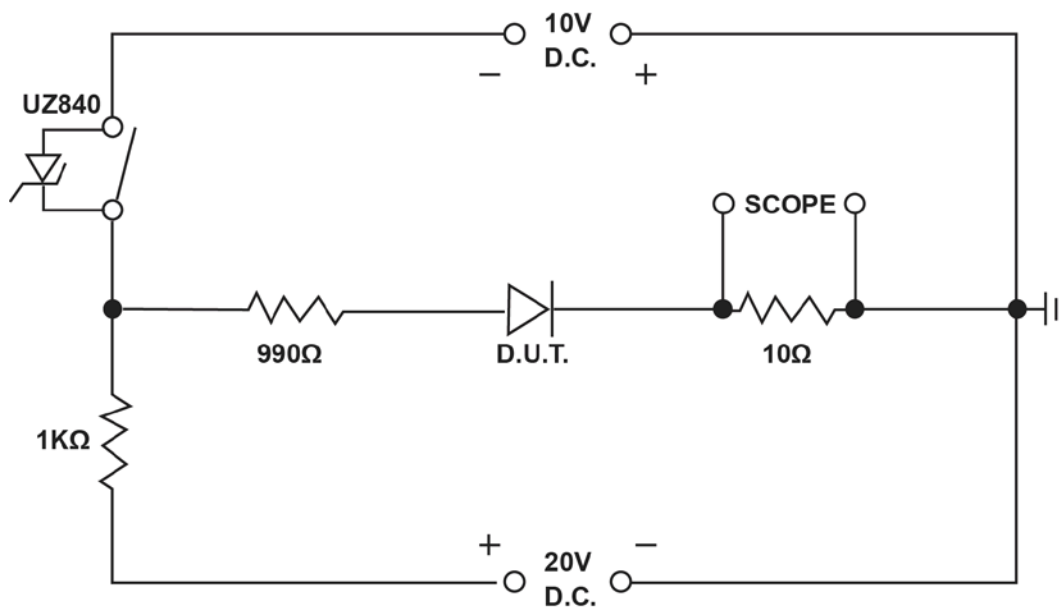
Maximum Current vs Lead Temperature


FIGURE 2

Maximum Current vs Lead Temperature

GRAPHS

FIGURE 3

Maximum Current vs Lead Temperature


FIGURE 4

Reverse-Recovery Circuit

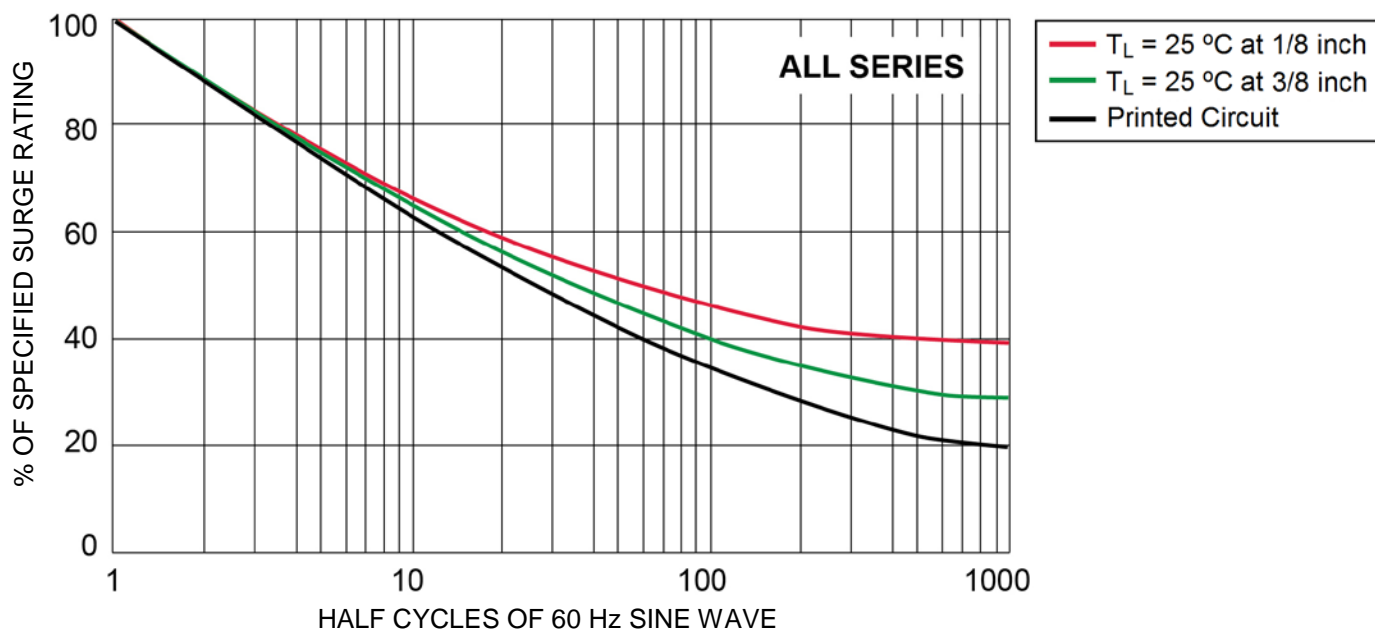
GRAPHS


FIGURE 5
Allowable Forward Surge vs Number of Cycles

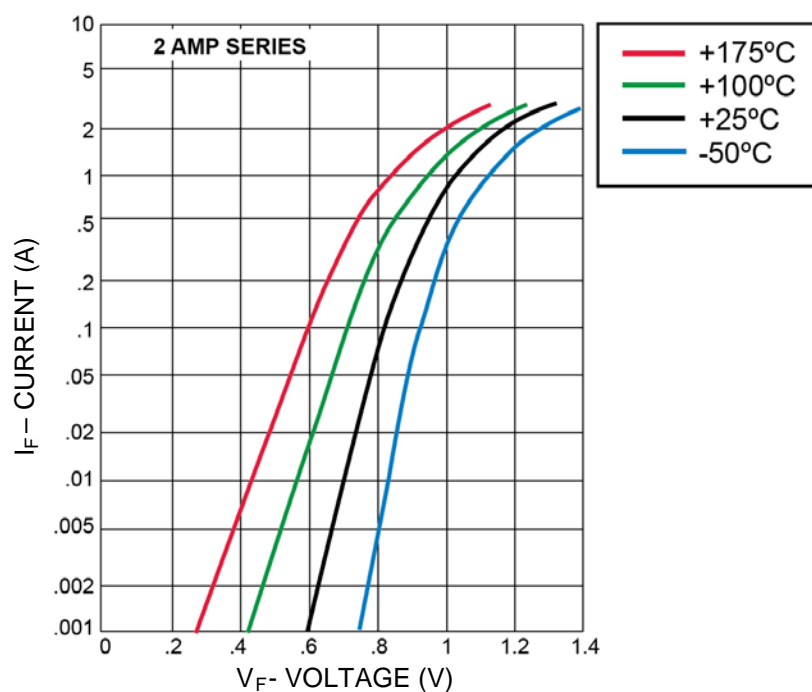


FIGURE 6
Typical Forward Current vs Forward Voltage

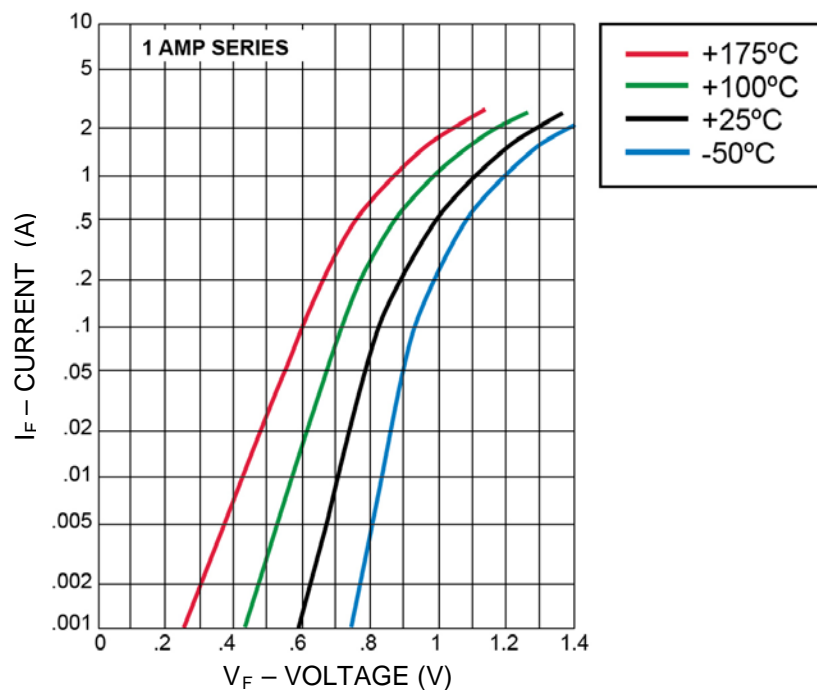
GRAPHS


FIGURE 7
Typical Forward Current vs Forward Voltage

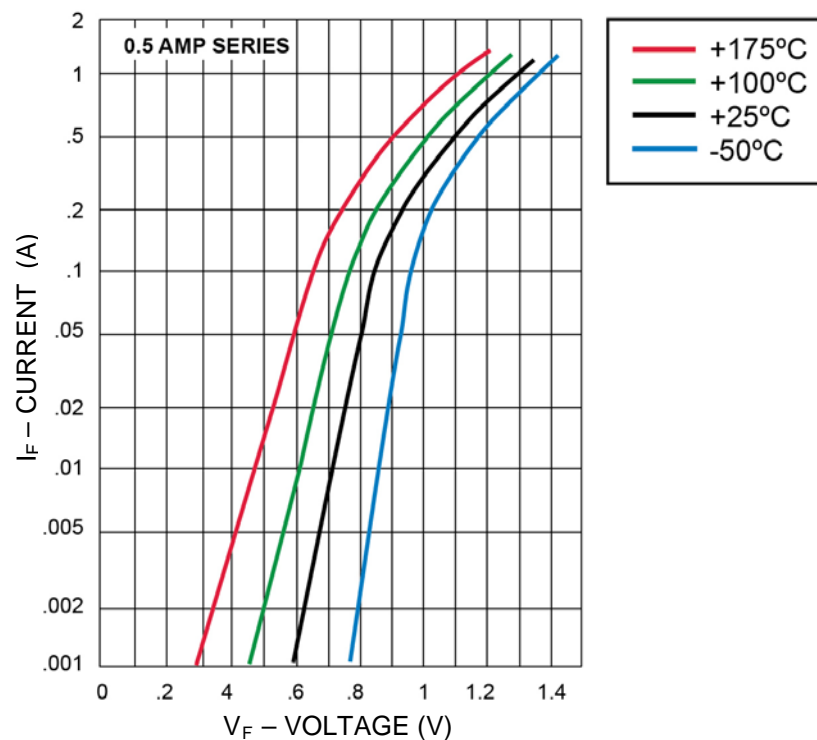
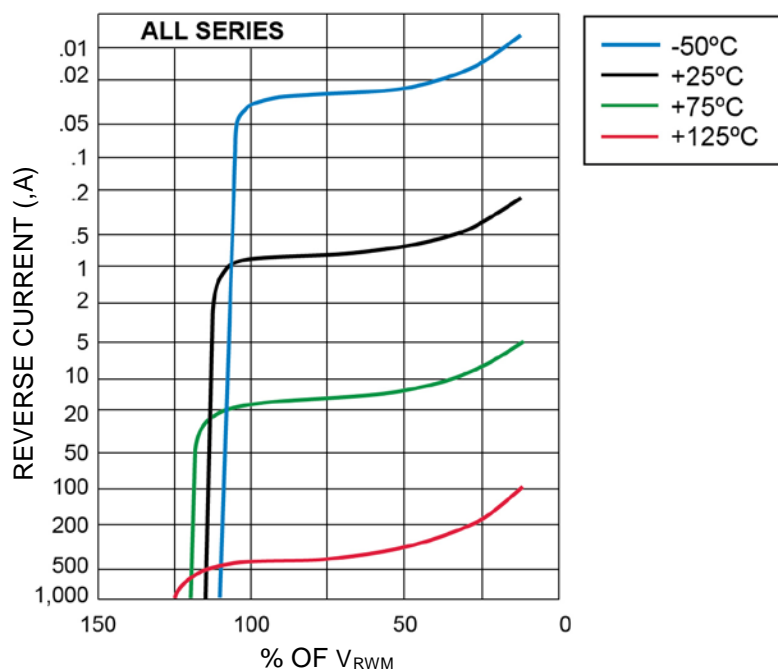
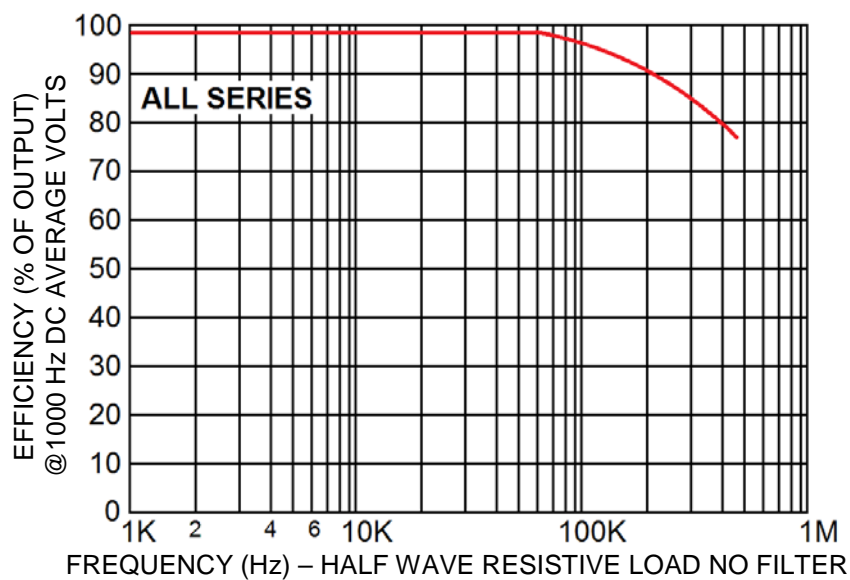


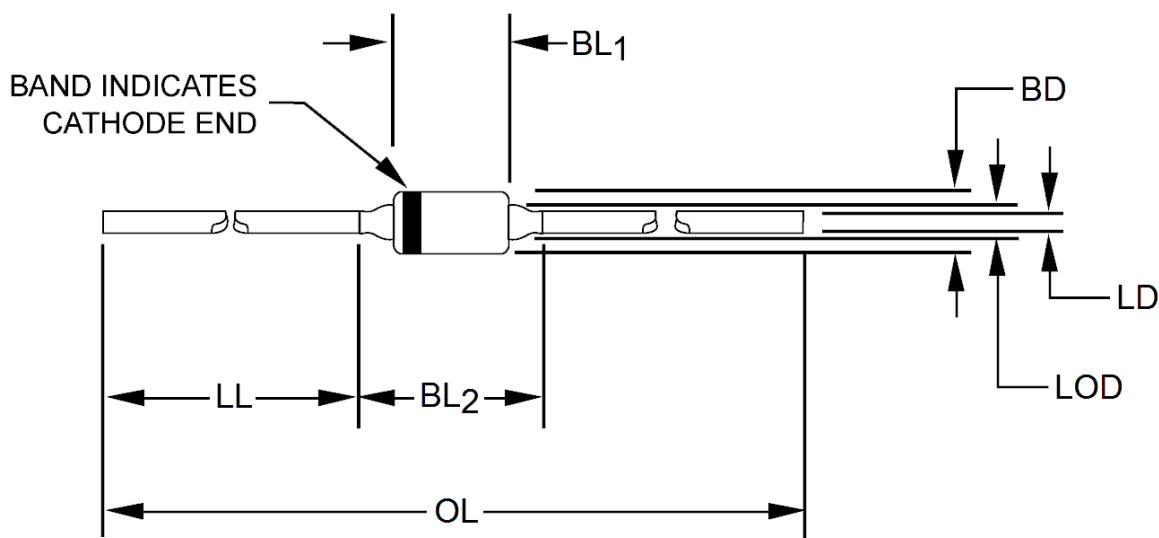
FIGURE 8
Typical Forward Current vs Forward Voltage

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 BL₂ 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 Φ x symbology.

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