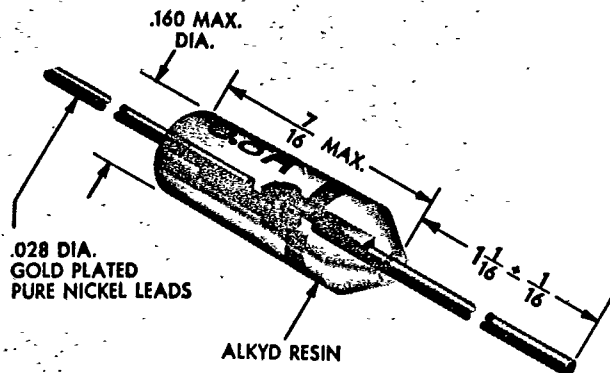




## SZ ZENER DIODES Heavy Duty Type

- Smaller Package.
- Higher Voltages.
- Gold Plated Leads.
- Heavy Tantalum Heat Sinks.
- Banded and Tapered Cathode.
- All Welded and Brazed Assembly.
- Power Rating Increased To 1 Watt.



- Conservative 1 WATT RATING
- Large 10 watt junction in a small package.
- Cool operation. Insulated case.
- Mass-produced for LOW COST.

A mass-produced, large alloyed silicon junction has been placed into a small, rugged package to produce a zener diode with maximum surge capacity and stability. The low dynamic impedance assures superior performance in voltage regulators, clippers, surge protectors, and numerous other applications. An inner epoxy seal, long leakage paths, and high pressure molding permits reliable operation in all environments.

### Characteristics and Maximum Ratings:

Storage temperature: — 65° to 150°C.

Operating temperature: — 65° to 150°C.

Maximum junction temperature: 175°C.

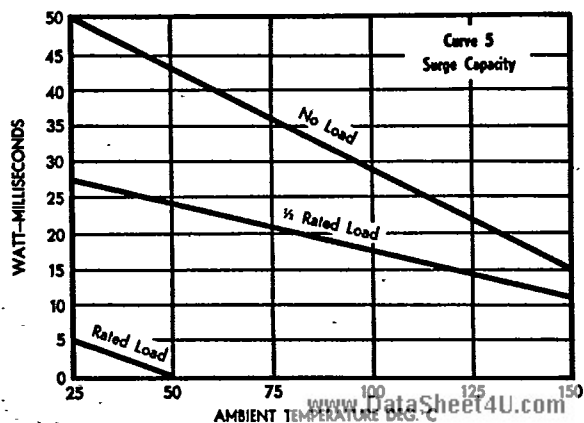
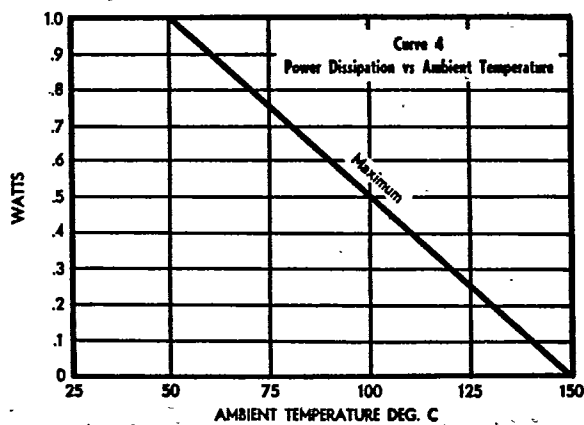
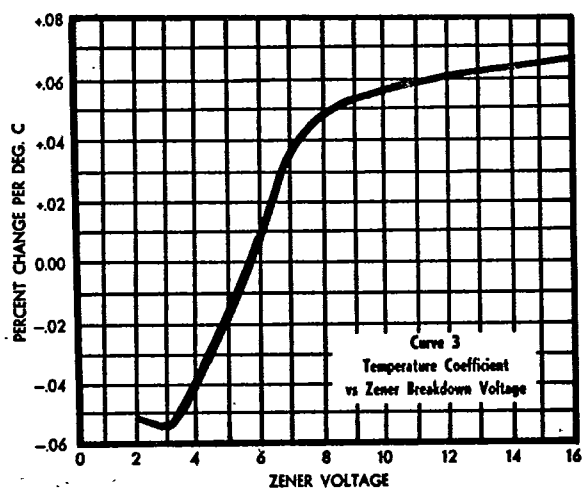
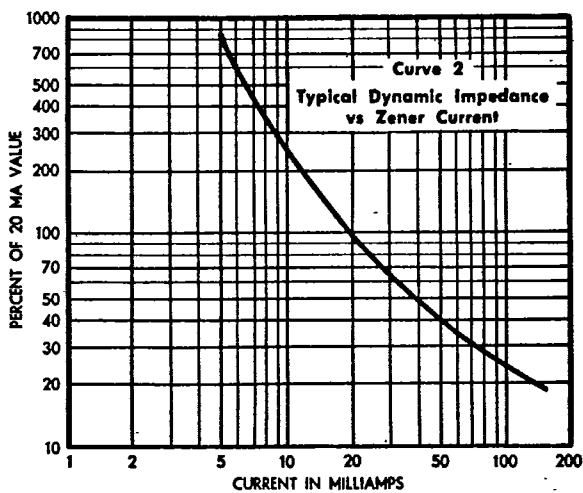
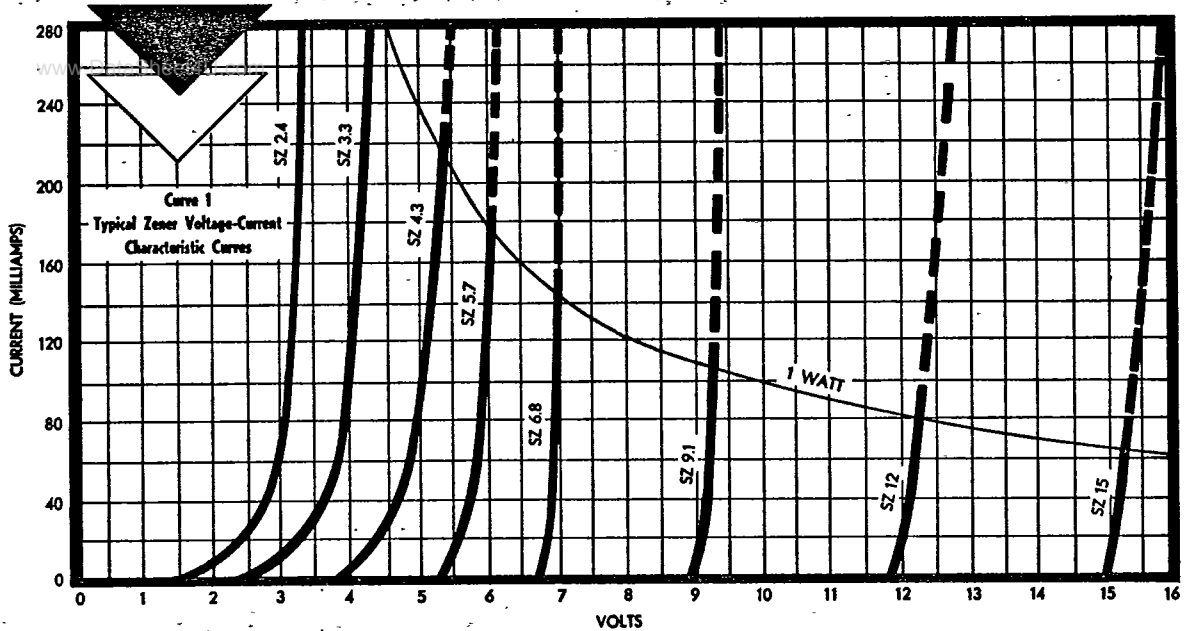
Thermal resistance from junction to ambient: .10°C/mw (still air).

Forward drop at .5 amp.: 1.0V max.

## RATING TABLES

Schauer Type No. 10% Tolerance (Note 1)	Nominal Zener Voltage $I_z/r = 20 \text{ ma}$ $T_A = 25^\circ\text{C.}$	Dynamic Impedance				Maximum Recommended Zener Current	Typical Temperature Coefficient of Voltage (%/°C.)
		Maximum $I_z/r = 20 \text{ ma}$	Typical $I_z/r = 20 \text{ ma}$	Typical $I_z/r = 50 \text{ ma}$	Typical $I_z/r = 100 \text{ ma}$		
SZ 2.4	2.4 volts	27 ohms	14 ohms	6.2 ohms	3.2 ohms	420 ma	—.054
SZ 2.7	2.7	27	16	7.0	3.7	370	—.055
SZ 3.0	3.0	27	17	7.5	3.9	340	—.055
SZ 3.3	3.3	27	17	7.5	3.9	300	—.054
SZ 3.6	3.6	25	17	7.5	3.9	280	—.050
SZ 3.9	3.9	23	17	7.5	3.9	260	—.045
SZ 4.3	4.3	21	17	7.5	3.9	240	—.037
SZ 4.7	4.7	20	12	5.3	2.8	220	—.029
SZ 5.1	5.1	16	10	4.3	2.3	200	—.019
SZ 5.6	5.6	12	6.0	2.6	1.4	180	—.009
SZ 6.2	6.2	6	2.0	0.86	0.5	160	+ .018
SZ 6.8	6.8	4	1.5	0.66	0.4	150	+ .035
SZ 7.5	7.5	4	1.5	0.66	0.4	140	+ .044
SZ 8.2	8.2	5	2.0	0.86	0.5	120	+ .049
SZ 9.1	9.1	6	4.0	1.8	0.9	110	+ .053
SZ 10.0	10.0	6	5.0	2.6	1.4	100	+ .055
SZ 11.0	11.0	8	6.0	3.0	1.6	91	+ .057
SZ 12.0	12.0	8	7.0	3.5	1.8	83	+ .059
SZ 13.0	13.0	10	7.0	3.7	1.9	77	+ .061
SZ 15.0	15.0	10	8.0	4.0	2.1	66	+ .065
SZ 16.0	16.0	10	8.0	4.2	2.3	62	+ .066

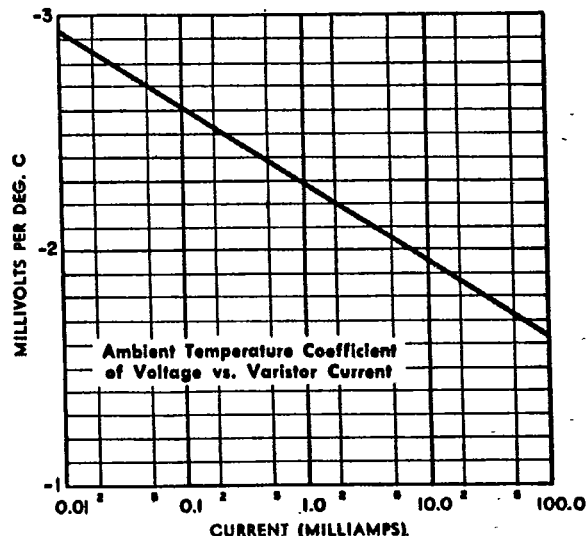
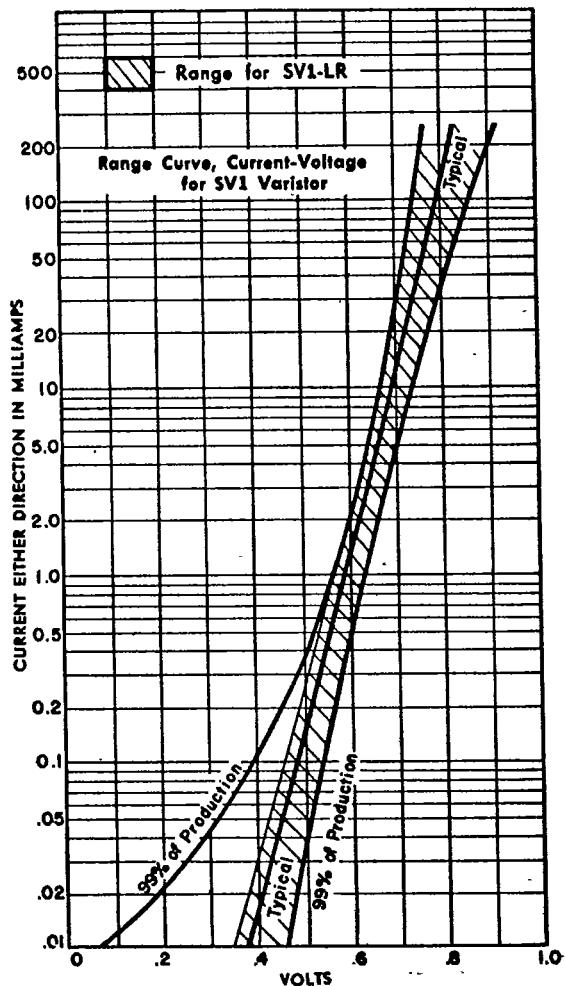
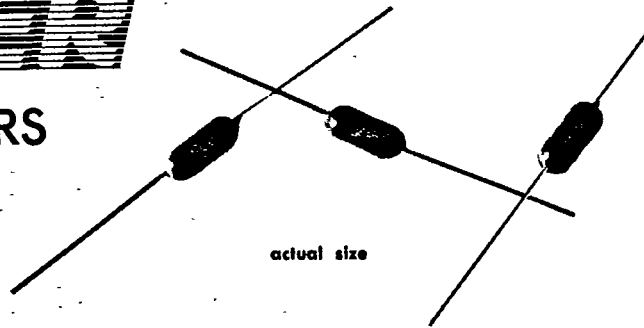
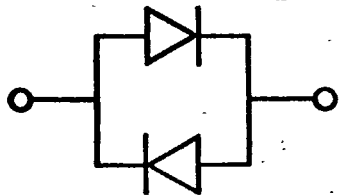
Note 1: Add suffix "A" for 5% tolerance (i.e., SZ 4.7A for  $4.7 \pm 5\%$  volts). 1.0% and 2.0% units available from factory.





# SILICON VARISTORS

U.S. Patent No. 3,134,935



## SV1 VARISTOR

The Schauer SV1 Varistor consists of two matched silicon junctions connected in parallel and oppositely poled. The unit is encapsulated with an alkyd molding compound and has 0.028" dia., welded, axial gold plated nickel leads.

It is designed to replace the Schauer Model A5134 copper oxide varistor in telephone service and for numerous other applications such as fractional voltage regulators, negative temperature coefficient resistors, and meter protectors. They may be placed in series or parallel to yield higher voltages or currents.

The SV1 Varistor directly converts linear AC and DC information into logarithmic information over four decades following the curve  $I \text{ (ma)} = e^{26(E-.59)}$  between the ranges  $I = .02\text{ma}$  to 200 ma. The dynamic impedance at any current may be calculated by  $Z_d \text{ (ohms)} = 1/26I \text{ (amps)}$ .

## SV1-LR VARISTOR

The Schauer SV1-LR Varistor is identical to the SV1 except that the log characteristics have been extended to five decades. This premium unit is designed for critical applications in the microamp range. Varistors with special characteristics and tolerances within the boundaries of the range curves are available from the factory at nominal charge.

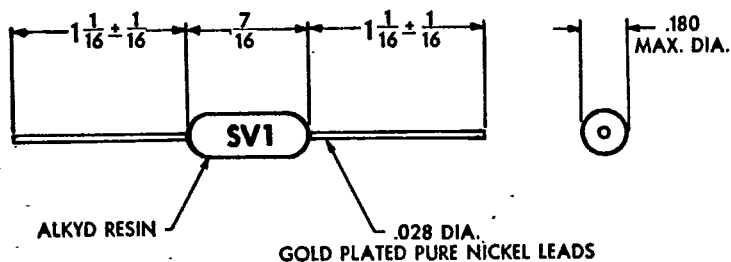
### Electrical Characteristics

Test limits: 10 microamperes max. at .2V DC  
100 milliamperes min. at .9V DC  
10 microamperes max. at .35V DC (SV1-LR only)

Dissipation:  $\frac{3}{4}$  watt at 25°C,  $\frac{1}{4}$  watt at 100°C. Maximum  $\frac{1}{2}$  cycle surge current: 25 amps peak.

### Physical Characteristics

An inner epoxy seal, long leakage paths, and high pressure molding assures reliable performance in all environments.



Semiconductor Division

# SCHAUER MANUFACTURING CORP.

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Cincinnati, Ohio 45242

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Telex 21-4576

## INTRODUCTION

### SCHAUER CLOSE TOLERANCE Z AND SZ SERIES 1 WATT ZENER DIODES

This catalog provides the user with the most efficient method of selecting the correct device for their application without delay for additional device information. If additional device or application information is required, please contact any of our Schauer representatives listed on the last page of this catalog or Schauer Manufacturing Corporation at (513) 791-3030.

Schauer has over 20 year's experience in manufacturing to rigid requirements. All zeners are 100% hand-tested, allowing Schauer to test at variable test currents and tolerances to meet your specs - a unique advantage! Our inventory system categorizes diodes in .1 volt increments, permitting us to offer tight tolerance zener diodes at low competitive pricing.

Schauer maintains a stock of nearly (3) million devices so that any type is available in production quantities. Normal delivery is (1) week after receipt of order.

Schauer's standard close tolerance zener diodes are graded on a two second test with an  $I_{ZT}$  of 20ma and an ambient temperature of 25°C. For types below 4 volts and above 8 volts, the temperature coefficient and the junction loading effects will cause  $V_Z$  to deviate from its specified value at other currents, but for many applications the consistent dynamic impedance and temperature coefficient from one diode to another is all that the circuitry requires. Frequently, expensive potentiometers and variable temperature compensating circuits can be eliminated in close tolerance circuits.

IMPORTANT      IMPORTANT      IMPORTANT

The voltage tables for the SZ and Z series zeners do not list all the available voltages.

Schauer can supply any voltage from 2.4V through 33.0V in .1 volt increments to meet your test current and tolerance requirements! [www.DataSheet4U.com](http://www.DataSheet4U.com)

## Z SERIES 1 WATT ZENER DIODES

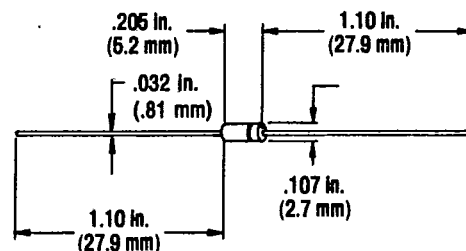
### ELECTRICAL CHARACTERISTICS

$V_F = .95$  Volts Max. @  $I_F = 200$  mA. Data at  $25^\circ\text{C}$  except  $T_C$

ELECTRICALLY SIMILAR TO  
1N4728 SERIES OF ZENERS

Type No.	Nominal Zener Voltage $V_Z @ I_{ZT}$	Test Current $I_{ZT}$ mA	Typical Zener Impedance			Typ $\Delta V_Z$ $I_{ZT}$ to $I_{ZK}$ Volts	Typ. Temperature Coefficient mV / $^\circ\text{C}$ @	
			$Z_{ZT}$ @ $I_{ZT}$ Ohms	$Z_{ZK}$ Ohms	$I_{ZK}$ mA		$I_{ZT}$	$I_{ZK}$
Z2.7	2.7	20	18	219	1.0	.92	-2.1	-1.2
Z3.0	3.0	20	18	243	1.0	.98	-2.1	-1.5
Z3.3	3.3	20	19	261	1.0	1.1	-2.2	-1.8
Z3.6	3.6	20	18	280	1.0	1.1	-2.2	-2.0
Z3.9	3.9	20	15	288	1.0	1.0	-1.9	-1.8
Z4.3	4.3	20	9.5	307	1.0	.90	-1.6	-1.8
Z4.7	4.7	20	4.7	274	1.0	.62	-0.1	-1.7
Z5.1	5.1	20	2.6	211	1.0	.44	+0.7	-1.1
Z5.6	5.6	20	0.7	60	1.0	.09	1.9	+0.9
Z6.2	6.2	20	1.1	14	1.0	.07	2.3	2.3
Z6.8	6.8	20	1.1	10	1.0	.07	2.7	2.7
Z7.5	7.5	20	1.2	10	1.0	.06	4.1	4.1
Z8.2	8.2	20	1.2	11	1.0	.09	4.4	4.4
Z9.1	9.1	20	1.9	12	1.0	.11	6.4	6.4
Z10	10.0	20	2.0	12	1.0	.12	7.0	7.0
Z11	11.0	20	2.9	42	1.0	.21	7.4	7.4
Z12	12.0	20	2.7	44	1.0	.26	8.3	8.3
Z13	13.0	20	2.5	43	1.0	.26	9.8	9.8
Z15	15.0	20	2.4	41	1.0	.26	12.0	12.0
Z16	16.0	20	2.8	36	1.0	.26	12.0	12.0
Z18	18.0	10	4.6	32	1.0	.26	12.4	12.4
Z20	20.0	10	5.3	27	1.0	.20	12.4	12.4
Z22	22.0	10	6.0	29	1.0	.25	17.0	17.0
Z24	24.0	10	6.4	31	1.0	.30	19.0	19.0
Z27	27.0	10	7.0	35	1.0	.32	22.8	22.8
Z30	30.0	10	8.5	40	1.0	.39	23.2	23.2
Z33	33.0	10	11.1	57	1.0	.50	24.0	24.0

- Any voltage from 2.6 to 34.0 in 1, 2, 5, 10% tolerances at any test current.
- Very good avalanche characteristics at low voltages.
- New, smaller DO41 epoxy molded case with tin coated leads.
- Lower prices.
- Higher voltages.
- Mix types for total quantity price break.

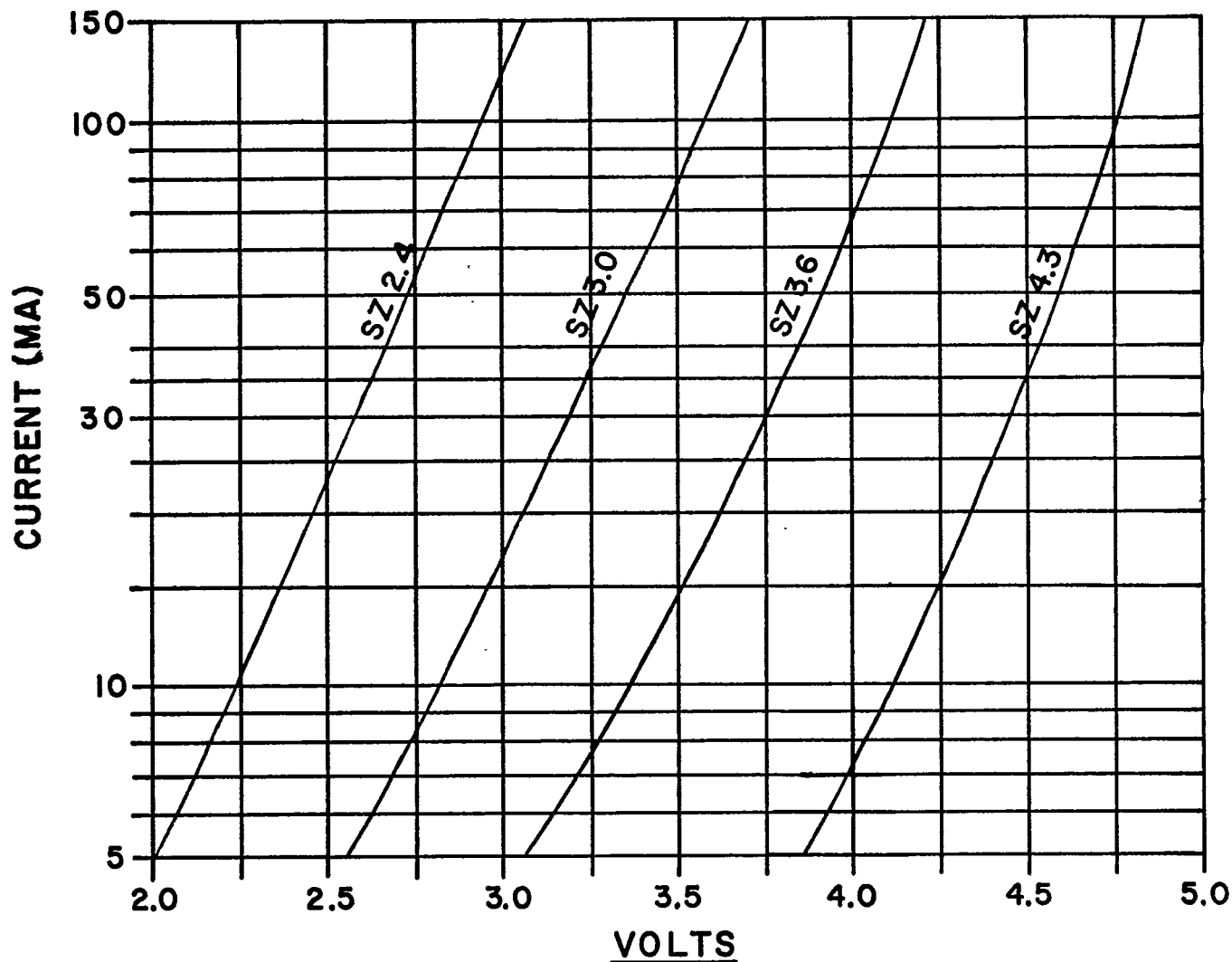


Unlisted voltages are in greater supply.

#### Notes:

1. How to order: use "Z" then voltage, percent, and then test current. Example: Z5.7 2% 1.5mA would be 5.7 volts  $\pm$  2% tolerance tested at 1.5mA.
2. Design for exact application voltage. Unlisted voltages are in greater supply.
3. Close tolerance diodes are measured with a 2 second test duration as standard.
4. Use our engineering staff for further information and same-day samples.

# VOLTAGE-CURRENT CURVES FOR SCHAUER LOW VOLTAGE ZENER DIODES

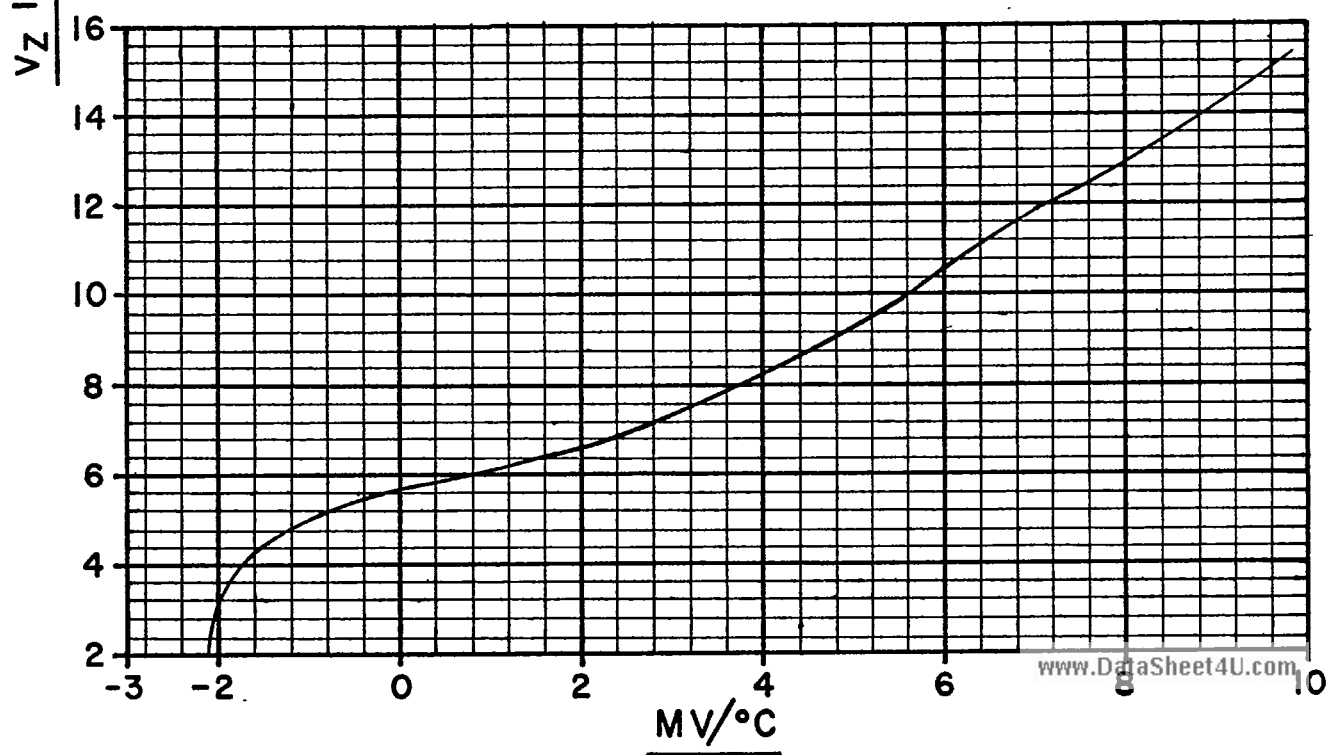
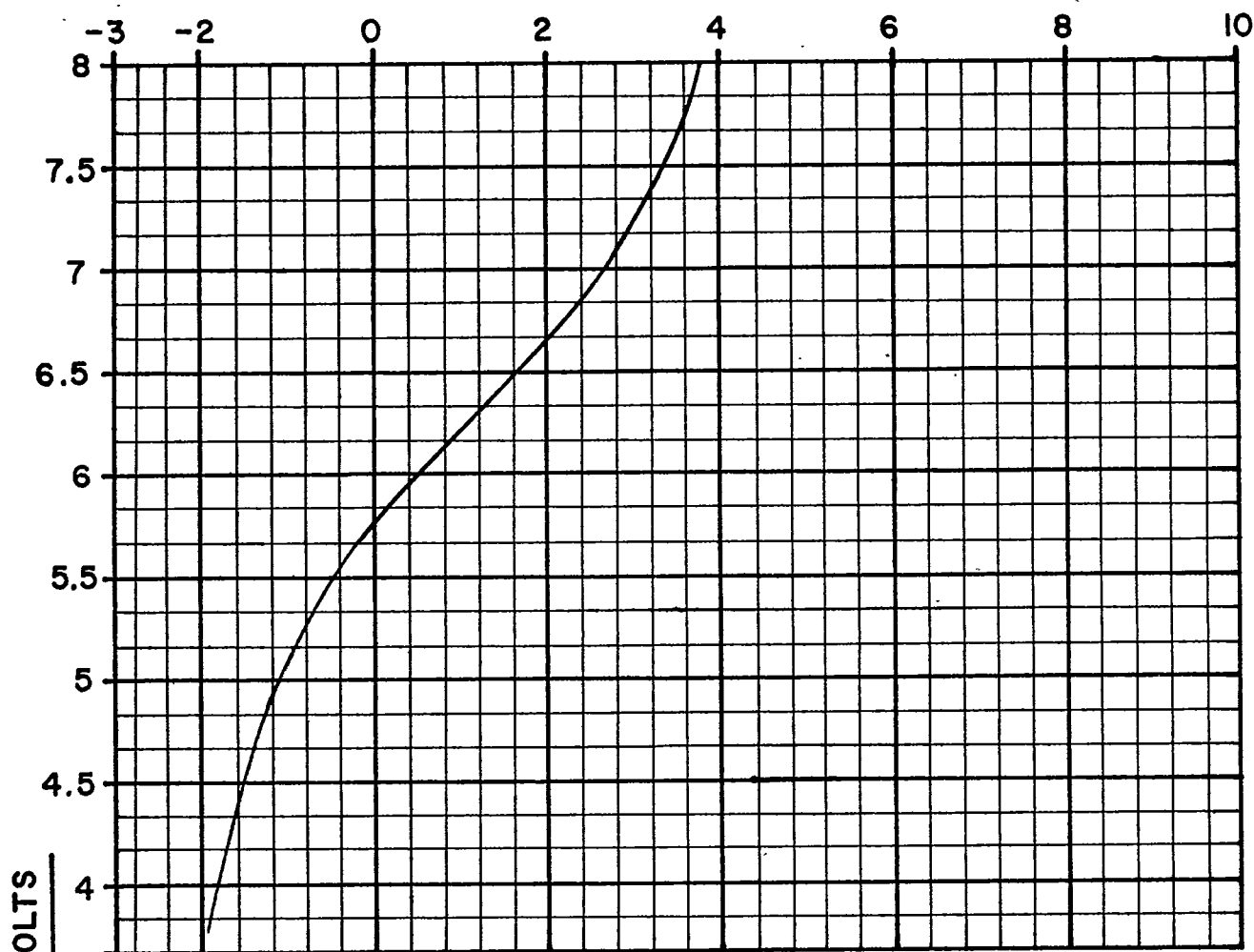


$$Z_D \text{ OHMS} = \frac{.296}{I \text{ (AMPS)}}$$

$$\Delta V_Z \text{ VOLTS} = .296 \int_{I_1}^{I_2} \frac{dI}{I} = .296 \ln \frac{I_2}{I_1}$$

# TEMPERATURE COEFFICIENTS FOR SCHAUER ZENER DIODES

www.DataSheet4U.com



www.DataSheet4U.com