Ultra High Precision Z-Foil Power Current Sensing Resistor with Absolute TCR of ± 0.05 ppm/°C and Load Life Stability to ± 0.005%



Product may not be to scale

Any value at any tolerance available with resistance range

THROUGH HOLE

INTRODUCTION

VCS232Z is the industry's first device to prove high rated power, excellent load life stability along with low TCR and all in one resistor.

The New Z-Foil Technology provides a significant reduction of the resistive components sensitivity to ambient temperature variations (TCR) and applied power changes (PCR).

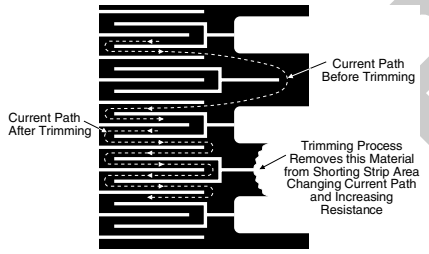
The latest development in Foil resistors technology have reduced the temperature coefficient of Resistance (TCR), to below ± 0.2 ppm/°C (part per million per degree centigrade). ± 0.05 ppm/°C Absolute TCR removes error due to temperature gradients.

By taking advantage of the overall stability and reliability of Vishay Bulk Metal® Z-Foil resistors, designers can significantly reduce circuit errors and greatly improve overall circuit performances.

Model VCS232Z is a 4 lead kelvin connected device.

Our Application Engineering Department is available to advise and make recommendations for non-standard technical requirements and special applications. Please contact us.

FIGURE 1 - TRIMMING TO VALUES (CONCEPTUAL ILLUSTRATION)



NOTE: Foil shown in black, etched spaces in white

FEATURES

- Temperature Coefficient of Resistance (TCR): ± 0.05 ppm/°C (Industrial range) ± 0.2 ppm/°C (MIL range)
- Resistance Range: 0.25Ω to 500Ω
- Power Coefficient "ΔR due to self heating": 4 ppm/W typical
- Load Life stability: < ± 0.005% 2W at 25°C for 2000 hours
- Power rating @ + 25°C: 2 Watts
- Tolerance: to ± 0.02%
- Electrostatic Discharge (ESD) above 25 000 Volts
- Short Time overload ≤ ± 0.005%
- Non hot spot design
- Thermal EMF: 0.05µV/°C
- Rise time: 1ns without ringing
- Current Noise < - 40dB
- Non Inductive/Capacitive design
- Voltage Coefficient < 0.1 ppm/V
- Thermal Finishes available Lead (Pb)-free, Tin/Lead Alloy
- Maximum current: 3 Amps
- For better performances please contact us

Pb-free Available

RoHS* COMPLIANT

APPLICATIONS

- Automatic Test Equipment (ATE)
- High Precision Instrumentation
- Electron Beam application
- Current Sensing applications
- Pulse applications
- Military
- Power amplifier
- Power supplies

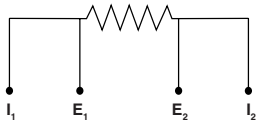
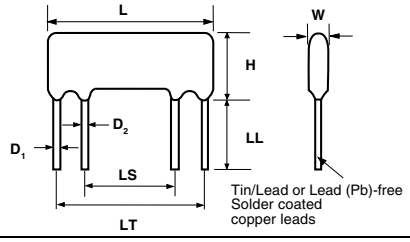


FIGURE 2 - DIMENSIONS in inches (millimeters)



Dimensions - Maximum Inches (mm) - unless otherwise noted

MODEL	L	H	W	LL (Minimum)	LS ± 0.20 (± 0.5)	LT ± 0.20 (± 0.5)	D_1 (Nominal)	D_2 (Nominal)
VCS232Z	1.240 (32.0)	0.512 (13.0)	0.177 (4.50)	0.500 (12.7)	0.688 (17.5)	1.083 (27.5)	0.040 (1.00)	0.032 (0.80)

* Pb containing terminations are not RoHS compliant, exemptions may apply

NEW PRODUCT

SALES
• AMERICAS: foilsales.usa@vishay.com • ASIA/JAPAN: foilsales.asia@vishay.com • UK/HOLLAND/SCANDINAVIA: foilsales.eunorth@vishay.com
• GERMANY/CZECH REPUBLIC/AUSTRIA: foilsales.eucentral@vishay.com • FRANCE/SWITZERLAND/SOUTHERN EUROPE: foilsales.eusouth@vishay.com • ISRAEL: foilsales.israel@vishay.com

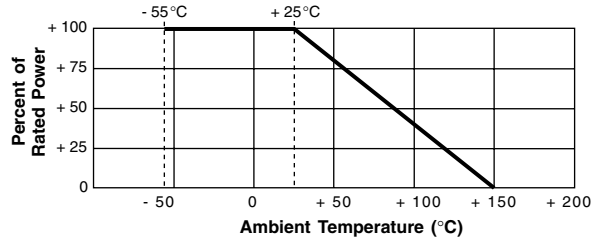
Ultra High Precision Z-Foil Power Current Sensing Resistor with Absolute TCR of ± 0.05 ppm/°C and Load Life Stability to ± 0.005%

TABLE 1 - PERFORMANCES*

TEST OR CONDITION	TYPICAL ΔR	MAXIMUM ΔR
Low temperature storage 24 hours @ - 55°C	± 0.002% (20 ppm)	± 0.005% (50 ppm)
Short time overload 6.25 x rated power	± 0.002% (20 ppm)	± 0.005% (50 ppm)
DWV	± 0.002% (20 ppm)	± 0.005% (50 ppm)
Moisture resistance	± 0.01% (100 ppm)	± 0.02% (200 ppm)
Terminal Strength	± 0.002% (20 ppm)	± 0.005% (50 ppm)
Load life (2 Watt, + 25°C, 2000 hours)	± 0.005% (50 ppm)	± 0.01% (100 ppm)
High temperature exposure 2000 hours @ + 150°C	± 0.01% (100 ppm)	± 0.02% (200 ppm)

* Measurement error 0.0005R

FIGURE 3 - POWER DERATING CURVE



(Further Derating Not Necessary)

FIGURE 4 - TYPICAL TCR CURVE Z-FOIL

(for more details see table 2)

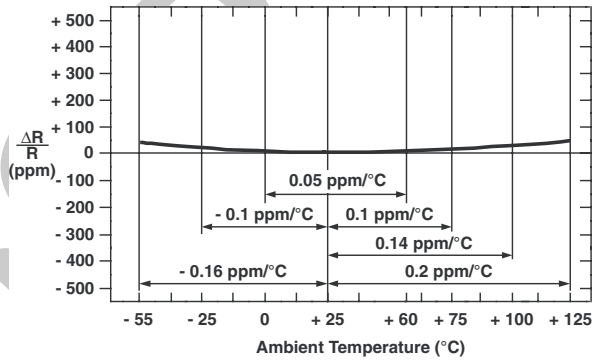


TABLE 2 - VCS232Z

RESISTANCE RANGE (Ω)	TIGHTEST RESISTANCE TOLERANCE	TYPICAL TCR AND MAX. SPREAD (ppm/°C)*
0.25 to < 10	± 0.05%	± 0.2 ppm/°C ± 2.8 ppm/°C
10 to 500	± 0.02%	± 0.2 ppm/°C ± 1.8 ppm/°C

Weight = 1.2 gms Maximum

* MIL-Range (- 55°C to + 125°C, + 25°C Ref.)

Contact Applications Engineering for other available values

TABLE 3 - ORDERING INFORMATION

MODEL	RESISTANCE VALUE			TERMINATION	ABSOLUTE TCR	ABSOLUTE TOLERANCE	PACKAGING
	RESISTANCE RANGE	LETTER DESIGNATOR	MULTIPLIER FACTOR				
VCS232Z	0.25Ω to < 500Ω	R	X 1.0	T = Lead (Pb)-free none = Tin/Lead Alloy	TCR0.2	Q = 0.02% A = 0.05% B = 0.1% C = 0.25% D = 0.5% F = 1%	B = Bulk
	Example: 249R00 = 249Ω						

* Specify the resistance value for each resistor of the network - even if all values are the same.

Example:
VCS232ZT1R0000TCR0.2AB
Model: VCS232Z (Z-Foil)
Value: R1 = 1Ω
Termination: Lead (Pb)-free
TCR0.2: 0.2 ppm/°C typical refers to any value in the resistance range
Tolerance: Absolute = 0.05%
Packaging: Bulk Pack

NEW PRODUCT

SALES

• AMERICAS: foilsales.usa@vishay.com • ASIA/JAPAN: foilsales.asia@vishay.com • UK/HOLLAND/SCANDINAVIA: foilsales.eunorth@vishay.com
• GERMANY/CZECH REPUBLIC/AUSTRIA: foilsales.eucentral@vishay.com • FRANCE/SWITZERLAND/SOUTHERN EUROPE: foilsales.eusouth@vishay.com • ISRAEL: foilsales.israel@vishay.com

Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.