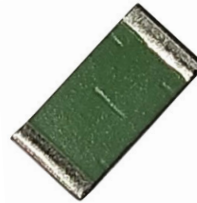


Bulk Metal® Foil Technology High Precision, Current Sensing, Power Surface Mount Resistor with Wrap-Around Terminals with Working Power up to 2.5 W and TCR to ± 5 ppm/°C

FEATURES

- Temperature coefficient of resistance (TCR): to ± 5 ppm/°C max. (-55°C to $+125^{\circ}\text{C}$, $+25^{\circ}\text{C}$ ref.)
- Power rating at 70°C : 1 W
- Working power at 70°C : to 2.5 W
- Resistance tolerance: to $\pm 0.1\%$
- Resistance range: 100 m Ω to 1 Ω
- Load-life stability: to $\pm 0.01\%$ typical (70°C , 2000 h at rated power)
- Short-time overload: 0.005% typical
- Solderable terminations
- Terminal finish available: lead (Pb)-free, tin/lead alloy
- Quick prototype quantities available; please contact foil@vpgsensors.com



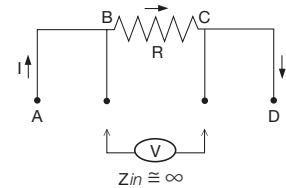
Top View



Bottom View



RoHS*
COMPLIANT



Four terminal (Kelvin) design:
allows for precise and accurate measurements.

INTRODUCTION

Model FRCS2512 is a surface mount chip resistor designed with 4 pads for Kelvin connection. Utilizing Bulk Metal® Foil as the resistance element, it provides enhanced characteristic capabilities resulting in superior performance when compared with other resistor technologies. The unique combination of Z Foil technology along with the designed 4-pad-wrap-around terminals provides high reliability of solder mounting connections.

Figure 1 – Power Derating Curve

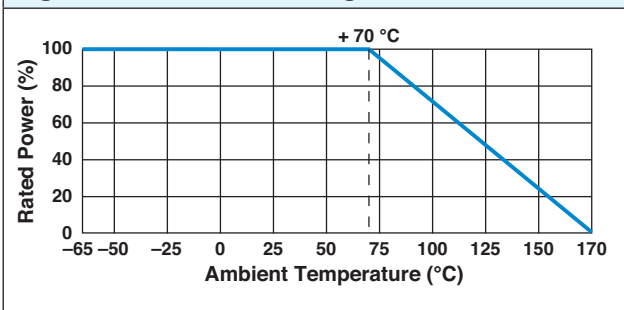


Table 1 – Specifications

Parameter	Value
Resistance range	100 m Ω to 1 Ω ⁽¹⁾
Power rating at 70°C	1 W
Maximum current ⁽²⁾	3.16 A
Tolerance	$\pm 0.1\%$
Temperature coefficient maximum (-55°C to $+125^{\circ}\text{C}$, $+25^{\circ}\text{C}$ Ref.)	± 5 ppm/°C
Operating temperature range	-65°C to $+170^{\circ}\text{C}$
Maximum working voltage	$(P \times R)^{1/2}$
Notes	
⁽¹⁾ Contact application engineering for values outside this range.	
⁽²⁾ Maximum current for a given resistance value is calculated using $I = \sqrt{P/R}$.	

Note

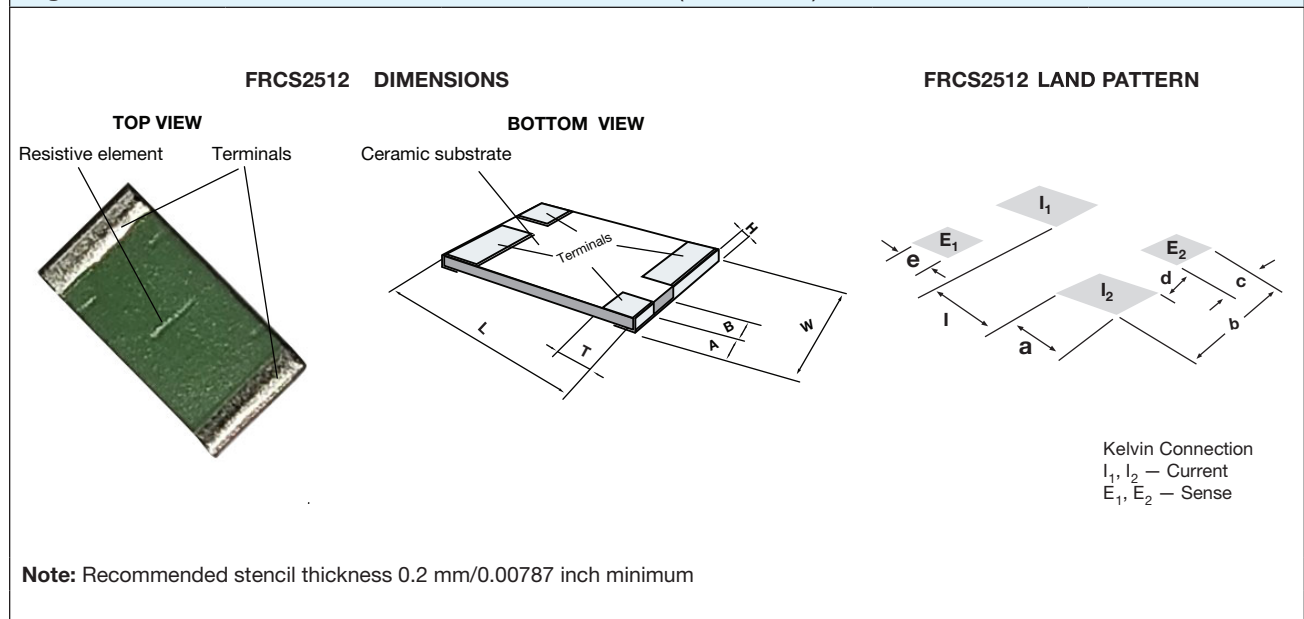
* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS compliant. Please see the information/tables in this datasheet for details.

KEY APPLICATIONS

Applications requiring accuracy and repeatability under stress conditions such as the following:

- Switching and linear power supplies
- Precision current-sensing
- Power management systems
- Feedback circuits
- Power amplifiers
- Measurement instrumentation
- Battery Management
- Medical and automatic test equipment
- Satellites and aerospace systems
- Commercial and Military avionics
- Test and measurement equipment
- Electronic scales

Figure 2—Dimensions and Land Pattern in Inches (Millimeters)



Dimensions – Tolerances ± 0.010 (± 0.254)					
L	W	H	T	A	B
0.270 (6.858)	0.126 (3.2004)	0.035 (0.889)	0.040 (1.016)	0.024 (0.6096)	0.035 (0.889)
Land Pattern Dimensions – Tolerances ± 0.003 (± 0.076)					
a	b	c	d	e	l
0.065 (1.65)	0.145 (3.68)	0.045 (1.14)	0.021 (0.53)	0.055 (1.39)	0.160 (4.06)

Table 2—Performance Specifications

Test/Condition	MIL-PRF-49465B ΔR LIMITS	Typical ΔR Limits ⁽¹⁾	Maximum ΔR Limits ⁽¹⁾
Thermal shock -65°C to +150°C, 5 cycles, 15 min at each extreme	±(0.5%+0.0005R)	0.01%	0.02%
Load-life stability 2000h, +70°C at rated power of 1 W terminals temperature 110°C	±(1%+0.0005R)	0.01%	0.03%
Load-life stability 2000h, +70°C at working power of 1.5 W terminals temperature 130°C	±(1%+0.0005R)	0.02%	0.04%
Load-life stability 2000h, +70°C at working power of 2 W terminals temperature 150°C	±(1%+0.0005R)	0.03%	0.05%
Load-life stability 2000h, +70°C at working power of 2.5 W terminals temperature 170°C	±(1%+0.0005R)	0.05%	0.1%
Short-time overload 5 x rated power (1 W), 5 s	±(0.5%+0.0005R)	0.005%	0.01%
Short-time overload 5 x working power (1.5 W), 5 s	±(0.5%+0.0005R)	0.02%	0.05%
High temperature exposure 1000 h, +170°C	±(1.0%+0.0005R)	0.02%	0.05%
Low temperature storage -65°C for 24 h	±(0.5%+0.0005R)	0.003%	0.005%
Low temperature operation -65°C 45 min at Rated Power	±(0.2%+0.0005R)	0.003%	0.005%
Moisture resistance MIL-STD-202, method 106, 0 power	±(0.5%+0.0005R)	0.005%	0.01%
Shock 100 g, 6 ms, 5 pulses	±(0.1%+0.0005R)	0.002%	0.005%
Vibration (10 Hz to 2000 Hz) 20 g, Discontinuity 0.1ms	±(0.1%+0.0005R)	0.002%	0.005%
Resistance to soldering heat Per MIL-PRF-55342 para. 4.8.8.1	±(0.25%+0.0005R)	0.03%	0.05%

Note
⁽¹⁾ Measurement error allowed for ΔR limits: 0.0005 Ω.

Figures 3—Global Part Number Information⁽¹⁾

