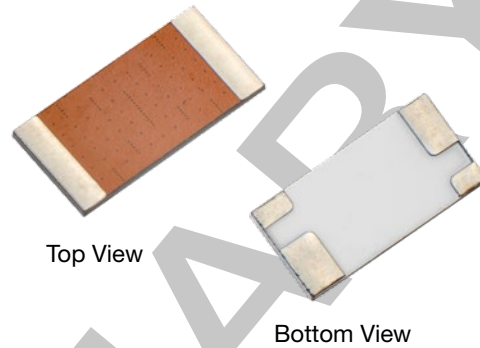


Bulk Metal® Foil Technology High Precision, Current Sensing, Power Surface Mount Resistor with Wrap-Around Terminals with Rated Power up to 1 W and TCR to ± 5 ppm/ $^{\circ}\text{C}$

FEATURES

- Temperature coefficient of resistance (TCR): to ± 5 ppm/ $^{\circ}\text{C}$ max. (-55°C to $+125^{\circ}\text{C}$, $+25^{\circ}\text{C}$ ref.)
- Power rating: 1 W
- Resistance tolerance: to $\pm 0.1\%$
- Resistance range: 50 m Ω to 500 m Ω
- Load-life stability: to $\pm 0.05\%$ 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



RoHS*
COMPLIANT

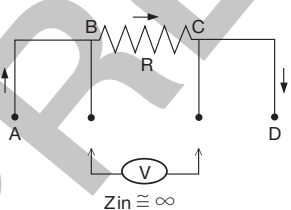
KEY APPLICATIONS

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

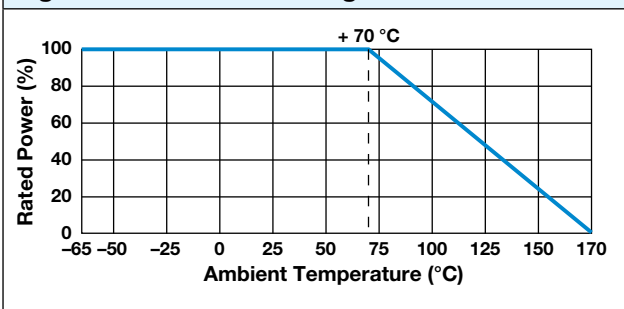
INTRODUCTION

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 pads wrap-around terminals provides high reliability of solder mounting connections.



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

Figure 1 – Power Derating Curve



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.

Table 1 – Specifications	
Parameter	Value
Resistance range	50 mΩ to 500 mΩ ⁽¹⁾
Power rating at 70°C	1 W
Maximum current ⁽²⁾	4.5 A
Tolerance	±0.1%
Temperature coefficient maximum (-55°C to +125°C, +25°C Ref.)	±10 ppm/°C ⁽³⁾ , R <200 mΩ; ±5 ppm/°C R ≥200 mΩ
Operating temperature range	-65°C to +170°C
Maximum working voltage	(P x R) ^{1/2}
Notes	
⁽¹⁾ Contact application engineering for values outside this range.	
⁽²⁾ Maximum current for a given resistance value is calculated using $I = \sqrt{P/R}$.	
⁽³⁾ For tighter TCR, please contact application engineering: foil@vpgsensors.com.	

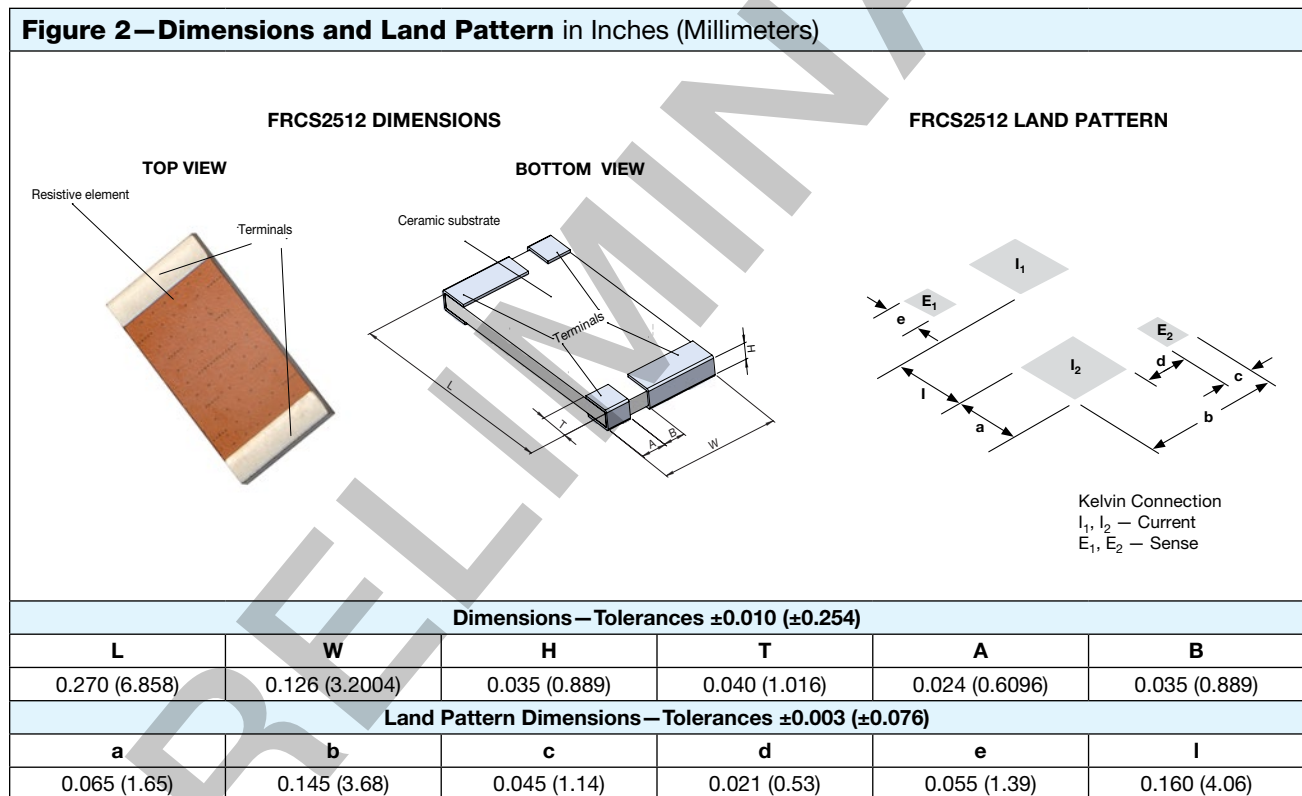
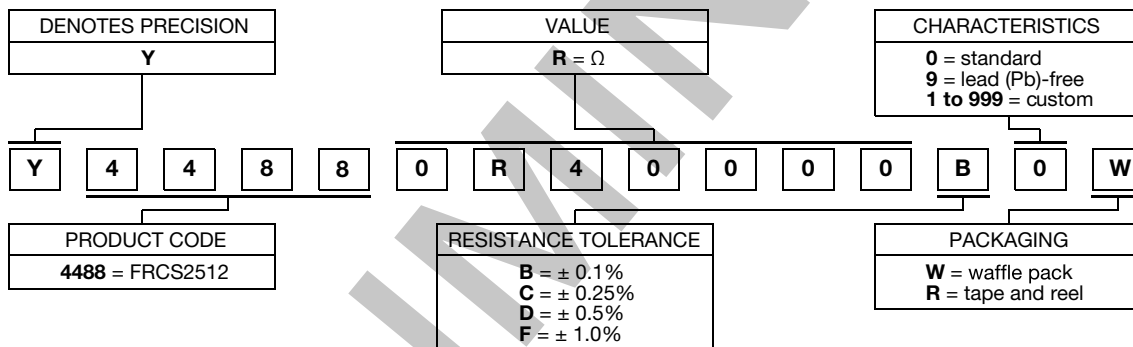


Table 2—Performance Specifications			
Test/Condition	MIL-PRF-49465B ΔR LIMITS	Resistance Value	Typical ΔR Limits ⁽¹⁾
Thermal shock -65°C to +150°C, 5 cycles, 15 min at each extreme	$\pm(0.5\% + 0.0005R)$	50 m Ω to 500 m Ω	0.005%
Thermal shock -65°C to +150°C, 100 cycles, 15 min at each extreme	$\pm(0.05\% + 0.0005R)$	50 m Ω to 500 m Ω	0.05%
Load-life stability 2000 h, +70°C at rated power	$\pm(1.0\% + 0.0005R)$	50 m Ω to 500 m Ω	0.05%
Load-life stability 2000 h, +70°C at 2 W	$\pm(1.0\% + 0.0005R)$	50 m Ω to 500 m Ω	0.1%
Short-time overload 5 x rated power, 5 s	$\pm(0.5\% + 0.0005R)$	50 m Ω to 500 m Ω	0.005%
High temperature exposure 1000 h, 170°C	$\pm(1.0\% + 0.0005R)$	50 m Ω to 500 m Ω	0.1%
Note ⁽¹⁾ Measurement error allowed for ΔR limits: 0.0005 Ω .			

Figure 3—Global Part Number Information⁽¹⁾



FOR EXAMPLE: ABOVE GLOBAL ORDER Y4488 0R40000 B 0 W:

TYPE: FRCS2512

VALUE: 400.0 m Ω

ABSOLUTE TOLERANCE: $\pm 0.1\%$

TERMINATION: standard tin/lead

PACKAGING: waffle pack

Note

⁽¹⁾ For non-standard requests, please contact application engineering



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