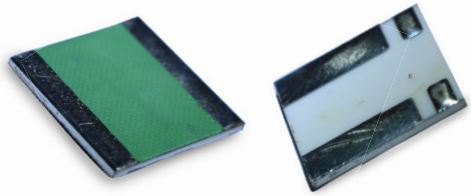
Bulk Metal® Foil Technology High Precision, Current Sensing, Power Surface Mount Resistor with Wrap-Around Terminals

with Rated Power up to 4 W and TCR ±10 ppm/°C

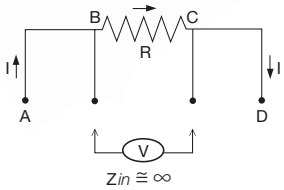
FEATURES

- Temperature coefficient of resistance (TCR): 10 ppm/°C max. (–55°C to +125°C, +25°C ref.)
- Power rating: to 4 W
- Resistance tolerance: to ±0.1%
- Resistance range: 40 mΩ to 400 mΩ
- Load-life stability: to ±0.03% Maximum (70°C, 2000 h at rated power)
- Short-time overload: 0.01% Maximum
- Power coefficient of resistance (PCR), "ΔR due to self heating": 5 ppm/W at rated power
- Electrostatic discharge (ESD): up to 25 kV
- Solderable terminations
- Terminal finish available: lead (Pb)-free, tin/lead alloy
- Quick prototype quantities available; please contact foil@vpgsensors.com



Pb-free Available

RoHS* COMPLIANT



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

INTRODUCTION

Model FRCS3637 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

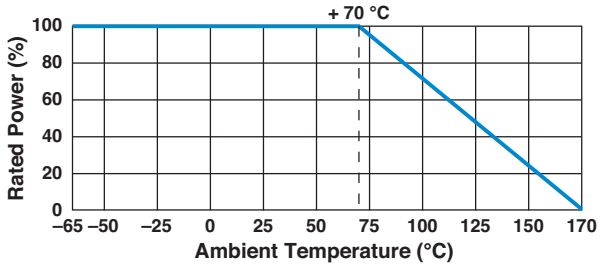


Table 1—Specifications

Parameter	Value
Resistance range	40 mΩ to 400 mΩ
Power rating at 70°C	up to 4 W
Maximum current	$(P / R)^{1/2}$
Tolerance	to±0.1%
Temperature coefficient maximum (–55°C to +125°C, +25°C Ref.)	±10 ppm/°C(2)
Operating temperature range	–65°C to +170°C
Maximum working voltage	$(P \times R)^{1/2}$

Notes
(1) Contact application engineering for values outside this range.
(2) For tighter TCR, please contact application engineering: foil@vpgsensors.com.

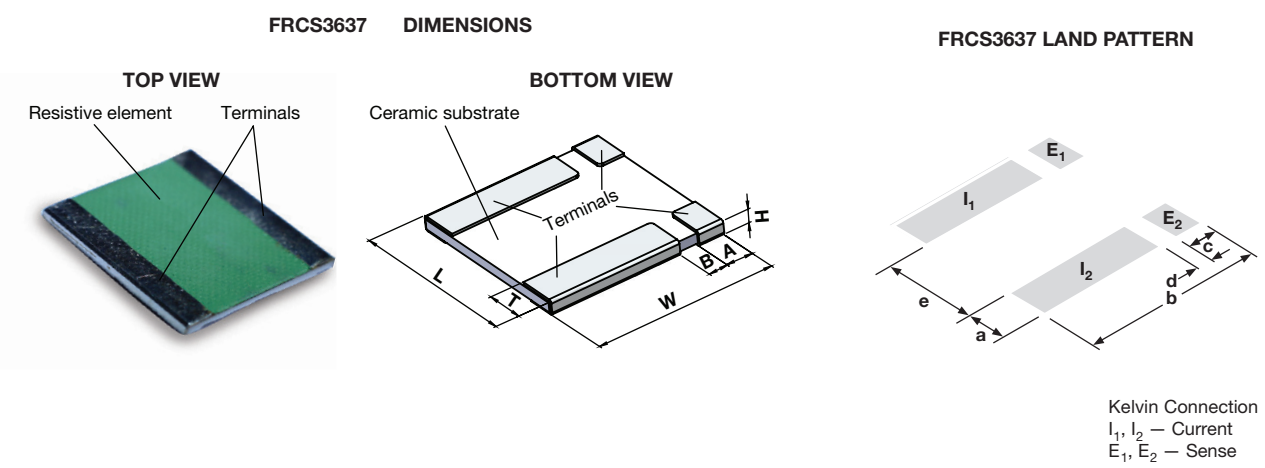
Note
* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS compliant. Please see the information/tables in this datasheet for details.

THE 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)



Note: Recommended stencil thickness 0.2 mm/0.00787 inch minimum

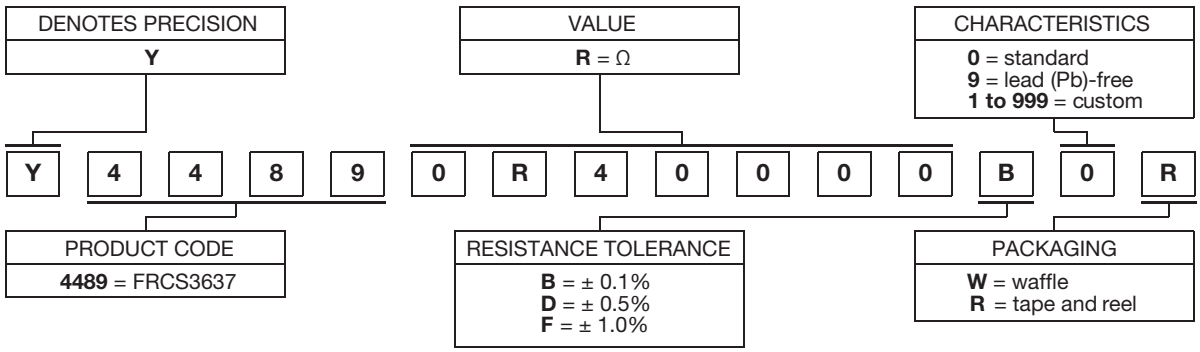
Dimensions—Tolerances ±0.010 (±0.254)					
L	**W**	**H**	**T**	**A**	**B**
0.365 (9.271)	0.370 (9.398)	0.028 (0.711)	0.091 (2.311)	0.058 (1.473)	0.040 (1.016)
Land Pattern Dimensions—Tolerances ±0.003 (±0.076)					
a	**b**	**c**	**d**	**e**	
0.116 (2.95)	0.390 (9.91)	0.066 (1.68)	0.024 (0.610)	0.178 (4.52)	

Table 3—Performance Specifications

Test/Condition	MIL-PRF-49465B ΔR LIMITS	Typical ΔR Limits(1)	Max 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 3 W terminals temperature 150°C	±(1.0% +0.0005R)	0.02%	0.03%
Load-life stability 2000h, +70°C at working power of 4 W terminals temperature 170°C		0.03%	0.05%
Short-time overload 15 W, 5 s 20 W, 5 s	±(0.5% +0.0005R)	0.005% 0.02%	0.01% 0.05%
High temperature exposure 1000 h, 170°C	±(1.0% +0.0005R)	0.02%	0.05%
Moisture resistance MIL-STD-202, method 106, 0 power, 7a and 7b not required	±(0.5% +0.0005R)	0.01%	0.02%
Shock 100 g, 6 ms, 5 pulses	±(0.1% +0.0005R)	0.05%	0.01%
Vibration High Frequency 10-2,000 Hz, 20g Discontinuity 0.1ms	±(0.1% +0.0005R)	0.05%	0.01%
Low Temperature Storage -55°C for 24 h	±(0.5% +0.0005R	0.003%	0.005%
Low Temperature Operation -65°C, 45 min. at 3W	±(0.2% +0.0005R)	0.005%	0.01%

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

Figures 3—Global Part Number Information(1)



FOR EXAMPLE: ABOVE GLOBAL ORDER Y4489 0R40000 B 0 R:
TYPE: FRCS3637
VALUE: 400.0 mΩ
ABSOLUTE TOLERANCE: ± 0.1%
TERMINATION: standard tin/lead
PACKAGING: tape and reel

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

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