

# General-Purpose Failsafe Moulded Wirewound Resistors

SPH/SPF Series **NOT RECOMMENDED FOR NEW DESIGNS**

## Features

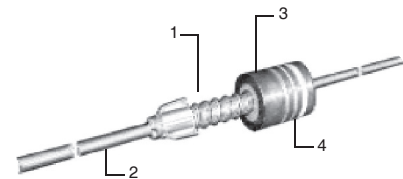
- Drop-in replacement for BWH/BWF
- 2 watt rated with 1 watt dimensions
- $\pm 5\%$ ,  $\pm 10\%$  tolerance
- 0.1 ohm to 2400 ohms
- TCR's as low as  $\pm 150$  ppm/ $^{\circ}\text{C}$  standard (custom TC's available)
- Weldable and solderable leads



 All Pb-free parts comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

## Electrical Data

Type		SPH	SPF
EIA RS-344 Style		CRU2	CRU2
MIL-R-11 Style		RC32/RC42	RC32/RC42
Resistance - Std.		0.1 $\Omega$ to 2400 $\Omega$	0.1 $\Omega$ to 1000 $\Omega$
Tolerance - Std.		$\pm 5\%$ , $\pm 10\%$	$\pm 5\%$ , $\pm 10\%$
Power Rating		2 watt @ 70 $^{\circ}\text{C}$ 1 watt @ 115 $^{\circ}\text{C}$ Derating to 0 @ 160 $^{\circ}\text{C}$	2 watt @ 70 $^{\circ}\text{C}$ 1 watt @ 115 $^{\circ}\text{C}$ Derating to 0 @ 160 $^{\circ}\text{C}$
Max. Continuous Working Voltage		$\sqrt{PR}$	$\sqrt{PR}$
Min. Insulation Resistance	Dry Wet	10,000 Meg 100 Meg	10,000 Meg 100 Meg
Min. Dielectric Withstanding Volts (RMS)	ATM Reduced Pressure	1000V 625V	1000V 625V
Hotspot Temperature Rise		145 $^{\circ}\text{C}$ @ 2 watts	145 $^{\circ}\text{C}$ @ 2 watts
Ambient Temperature Range		-65 to 160 $^{\circ}\text{C}$	-65 to 160 $^{\circ}\text{C}$
Current Noise		Negligible	Negligible



(See notes below)

### 1. Resistive Element

All resistor types have resistance alloy winding on a braided fiberglass substrate. Intermediate silicone coatings are used to enhance processibility and to provide protection to the resistive element.

### 2. Termination

The SPH and SPF resistors are terminated using an alloy coated copper flashed steel lead welded to a cap of the same material. This termination assembly is mechanically crimped, utilizing an improved crimp design, to the resistive element.

### 3. Encapsulation

The SPH and the SPF are encapsulated utilizing a compression molded phenolic plastic material. The SPF has a flame resistance coating applied over the resistive element to provide flammability protection when destructive overloads may occur.

### 4. Marking

All products are marked utilizing heat and solvent resistant color code bands consistent with EIA/MIL requirements. The first band is double width to designate wirewound construction. A fifth band, blue in color, is used for flameproof identification.

## General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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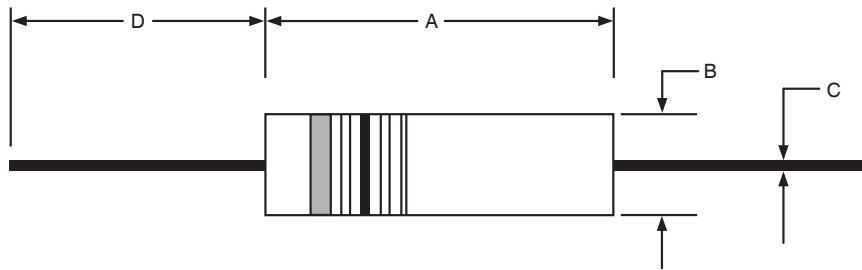
SPH/SPF Series

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## Environmental Data

Test	SPH	SPF
Temperature Coefficient (ppm/°C)	0.1Ω - 0.16Ω ± 1000 0.18Ω - 0.68Ω ± 800 0.75Ω - 2400Ω ± 400	0.10Ω ± 1700 0.11Ω - 0.16Ω ± 1000 0.18Ω - 0.68Ω ± 800 0.75Ω - 1000Ω ± 400
Dielectric Withstanding Voltage (RMS)	1000V	1000V
Momentary Overload	5%	5%
Low Temperature Operation	5%	5%
Temperature Cycle	5%	5%
Humidity	5%	5%
Load Life	5%	5%
Terminal Strength	5%	5%
Resistance to Solder Heat	5%	5%
Solderability	No Failures	No Failures

## Physical Data



Dimensions (Inches and (mm))

Type	A	B	C	D
SPH	0.562 ± 0.010 (14.3 ± 0.25)	0.225 ± 0.008 (5.72 ± 0.20)	0.032 ± 0.002 (0.813 ± 0.05)	1.50 ± 0.126 (38.1 ± 3.2)
SPF	0.562 ± 0.010 (14.3 ± 0.25)	0.225 ± 0.008 (5.72 ± 0.20)	0.032 ± 0.002 (0.813 ± 0.05)	1.50 ± 0.126 (38.1 ± 3.2)

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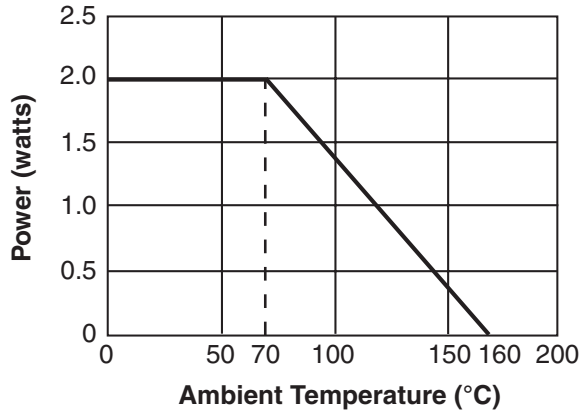
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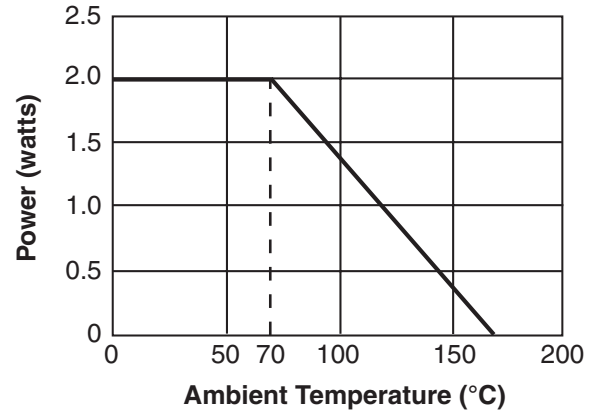
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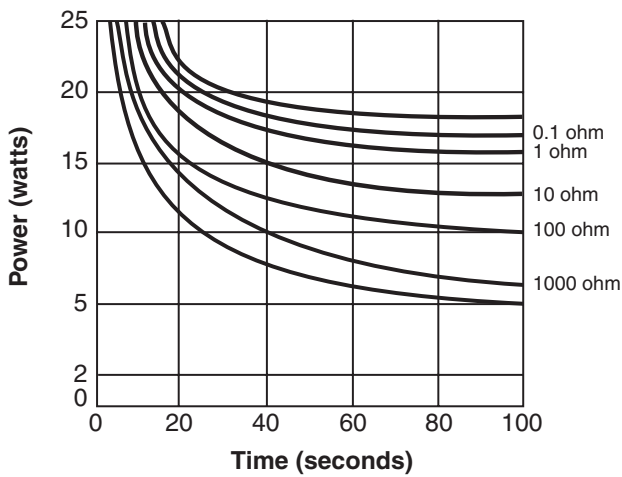
### SPH Power Derating Curve



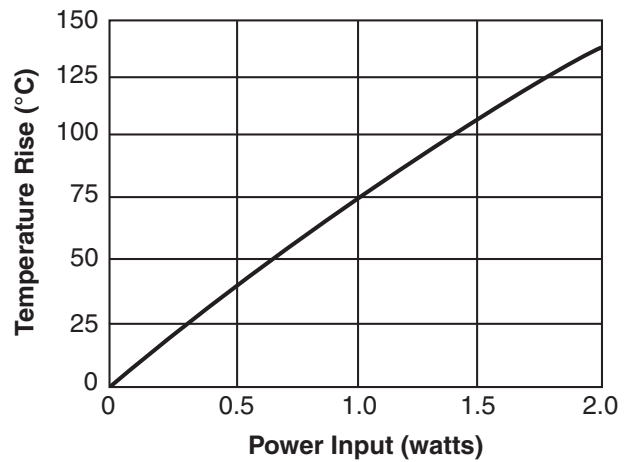
### SPF Power Derating Curve



### SPF Typical Fusing



### SPH and SPF Temperature Rise Chart



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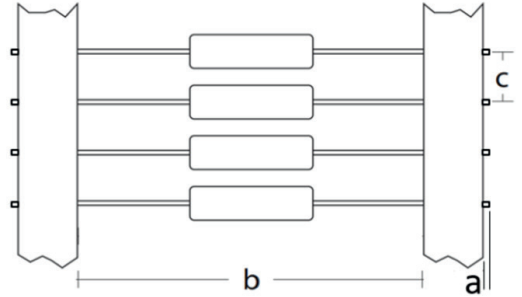
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## Packaging

Resistors are supplied taped and reeled (see Ordering Procedure for reel quantities.) The taping dimensions are shown below.

Taping dimensions, inches (mm)			
Type	a max	b	c
SPH, SPF	0.11 (2.8)	2.875±0.062 (73±1.6)	0.375±0.015 (9.5±0.4)



## Ordering Procedure

This product has two valid part numbers:

**European (Welwyn) Part Number: SPH-150RJI** (SPH, 150 ohms ±5%, Pb-free)

S	P	H	-	1	5	0	R	J	I
1		2		3		4			

1	2	3	4
Type	Value	Tolerance	Packing & Termination Finish
SPH	R = ohms	J = ±5%	I = Standard packing & Pb-free
SPF	K = kilohms	K = ±10%	Tape pack 1250/reel

**USA (IRC) Part Number: SPH1500JLF** (SPH, 150 ohms ±5%, Pb-free)

S	P	H	1	5	0	0	J	L	F
1		2		3		4			

1	2	3	4	Standard Packing
Type	Value	Tolerance	Termination Finish	
SPH	3 digits + multiplier	J = ±5%	Omit for SnPb	1250/reel
SPF	R = ohms for values <100 ohms	K = ±10%	LF = Pb-free	

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