

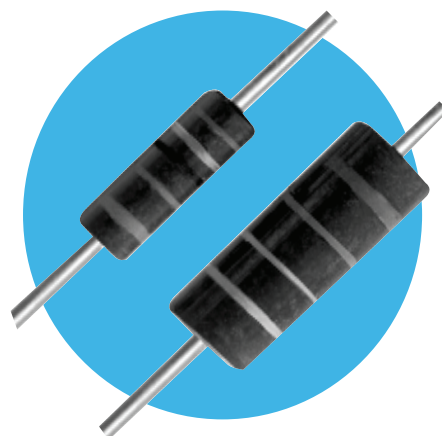
# Resistors

## General-Purpose Failsafe

### Moulded Wirewound Resistors

#### SP20 / SP20F Series

- SP20F UL1412 recognised fusing \*
- 0.1 ohm to 1200 ohms
- F version has flame resistant coating
- 1 watt rated with 1/2 watt dimensions
- Drop-in replacement BW20 / BW20F
- Weldable and solderable magnetic lead
- TCR's as low as  $\pm 150$  ppm/°C standard (custom TC's available)
- Lead free, RoHS compliant construction available



\* UL file number E234469



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

## Electrical Data

| Type                                  |       | SP20                                                                | SP20F                                                    |
|---------------------------------------|-------|---------------------------------------------------------------------|----------------------------------------------------------|
| EIA RS-344 Style                      |       | CRU 1                                                               |                                                          |
| MIL-R-11 Style                        |       | RC20/RC32                                                           |                                                          |
| Resistance Range                      | ohms  | 0R1 to 1k2                                                          | 0R1 to 1k                                                |
| UL Recognised Range                   | ohms  | N/A                                                                 | 4R7 to 470R                                              |
| Tolerance                             | %     | $\pm 5, \pm 10$                                                     |                                                          |
| Power rating                          | watts | 1 at 50°C<br>0.75 at 70°C<br>0.5 at 100°C<br>Derating to 0 at 160°C | 1 at 50°C<br>0.75 at 70°C<br>-<br>Derating to 0 at 160°C |
| Maximum continuous working voltage    |       | $\sqrt{PR}$                                                         |                                                          |
| Minimum insulation resistance         | dry   | 10,000 Meg                                                          |                                                          |
|                                       | wet   | 100 Meg                                                             |                                                          |
| Minimum dielectric withstanding volts | ATM   | 700V                                                                |                                                          |
| Reduced pressure                      | RMS   | 450V                                                                |                                                          |
| Hotspot temperature rise              |       | 120°C at 1 watt                                                     |                                                          |
| Current noise                         |       | Negligible                                                          |                                                          |

## Physical Data

| Dimensions (mm) |                 |                 |                  |                |  |
|-----------------|-----------------|-----------------|------------------|----------------|--|
| Type            | L               | D               | d                | f              |  |
| SP20            | 9.91 $\pm$ 0.25 | 3.56 $\pm$ 0.20 | 0.813 $\pm$ 0.05 | 38.1 $\pm$ 3.2 |  |
| SP20F           | 9.91 $\pm$ 0.25 | 3.56 $\pm$ 0.20 | 0.813 $\pm$ 0.05 | 38.1 $\pm$ 3.2 |  |

### Resistive Element

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

### Termination

The SP20 and SP20F 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.

### Encapsulation

The SP20 and SP20F are encapsulated utilizing a compression molded phenolic plastic material. The SP20F has a flame resistance coating applied over the resistive element to provide flammability protection when destructive overloads may occur.

### Marking

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

#### General Note

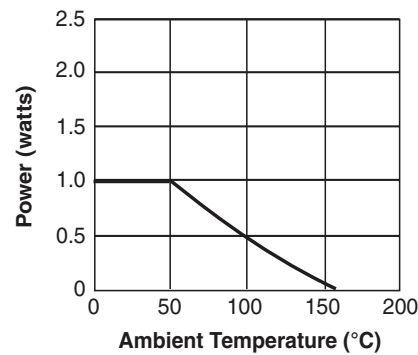
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Performance Data

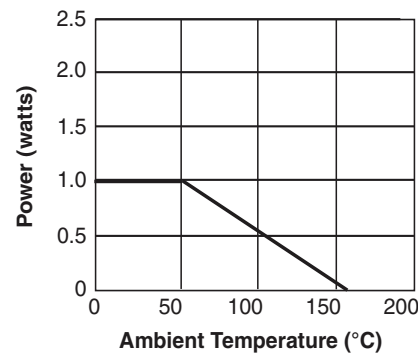
| Test                            |        | SP20                 | SP20F                 |
|---------------------------------|--------|----------------------|-----------------------|
| Temperature coefficient (ppm)   | ppm/°C | <1R ±800<br>≥1R ±150 | <1R ±800*<br>≥1R ±150 |
| Dielectric withstanding voltage | RMS    | 700V                 |                       |
| Momentary overload              | %      | 5                    |                       |
| Low temperature operation       | %      | 5                    |                       |
| Temperature cycle               | %      | 5                    |                       |
| Humidity                        | %      | 5                    |                       |
| Load life                       | %      | 5                    |                       |
| Terminal strength               | %      | 5                    |                       |
| Resistance to solder heat       | %      | 5                    |                       |

\*0.1 ohm SP20F <1000 ppm.

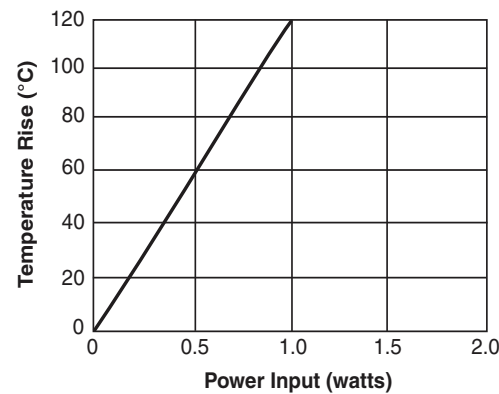
SP-20 Power Derating Curve



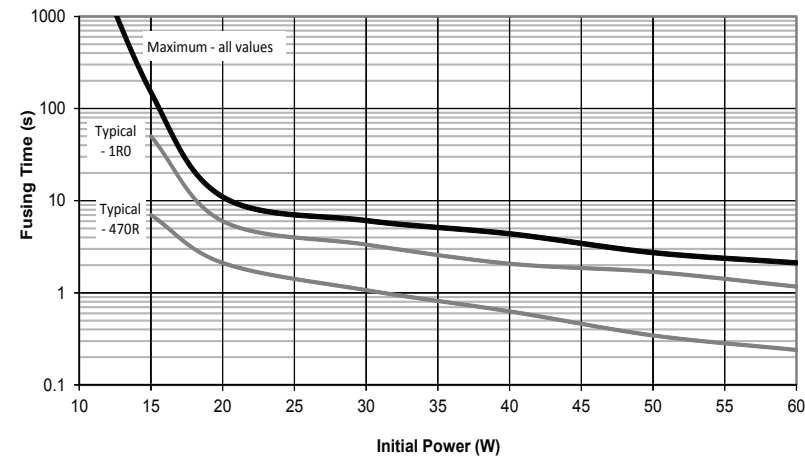
SP-20F Power Derating Curve



SP-20 and SP20F  
Temperature Rise Chart



SP20F Fusing Characteristic  
(Maximum & Typical Fusing Times)



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## Ordering Procedure

This product has two valid part numbers:

**European (Welwyn) Part Number: SP20FUL-180RJI** (SP20F with UL recognition, 180 ohms  $\pm 5\%$ , Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | P | 2 | 0 | F | U | L | - | 1 | 8 | 0 | R | J | I |
| 1 |   |   |   | 2 |   | 3 |   |   | 4 | 5 |   |   |   |

| 1<br>Type | 2<br>UL Status                                                                    | 3<br>Value  | 4<br>Tolerance | 5<br>Packing & Termination Finish |
|-----------|-----------------------------------------------------------------------------------|-------------|----------------|-----------------------------------|
| SP20      | UL = UL recognised<br>(SP20F only, see Electrical<br>Data for applicable values.) | R = ohms    | J = $\pm 5\%$  | I = Standard packing & Pb-free    |
| SP20F     |                                                                                   | K = kilohms | K = $\pm 10\%$ | Tape pack 4000/reel               |

**USA (IRC) Part Number: SP20FUL1800JLF** (SP20F with UL recognition, 180 ohms  $\pm 5\%$ , Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| S | P | 2 | 0 | F | U | L | 1 | 8 | 0 | 0 | J | L | F |  |  |
| 1 |   |   |   |   | 2 |   | 3 |   |   | 4 | 5 |   | 6 |  |  |

| 1<br>Type | 2<br>UL Status                                                                    | 3<br>Value                       | 4<br>Tolerance | 5<br>Packing & Termination Finish   | 6<br>Custom Code |
|-----------|-----------------------------------------------------------------------------------|----------------------------------|----------------|-------------------------------------|------------------|
| SP20      | UL = UL recognised<br>(SP20F only, see Electrical<br>Data for applicable values.) | 3 digits + multiplier            | J = $\pm 5\%$  | Omit for SnPb                       | Optional         |
| SP20F     |                                                                                   | R = ohms for<br>values <100 ohms | K = $\pm 10\%$ | LF = Pb-free<br>Tape pack 4000/reel |                  |

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BI Technologies IRC Welwyn

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