

General-Purpose Failsafe Moulded Wirewound Resistors

SP20 / SP20F Series

NOT RECOMMENDED FOR NEW DESIGNS

Features

- 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 ± 150 ppm/ $^{\circ}\text{C}$ 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)

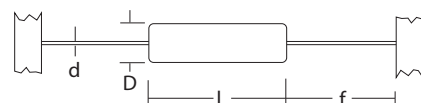
Electrical Data

| 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 ¹ | watts | 1 at 50 $^{\circ}\text{C}$ 0.75 at 70 $^{\circ}\text{C}$ 0.5 at 100 $^{\circ}\text{C}$ Derating to 0 at 160 $^{\circ}\text{C}$ | 1 at 50 $^{\circ}\text{C}$ 0.75 at 70 $^{\circ}\text{C}$ - Derating to 0 at 160 $^{\circ}\text{C}$ |
| Maximum continuous working voltage | | $\sqrt{\text{PR}}$ | |
| Minimum insulation resistance | dry | 10,000 Meg | |
| | wet | 100 Meg | |
| Minimum dielectric withstanding volts | ATM | 700V | |
| Reduced pressure | RMS | 450V | |
| Hotspot temperature rise | | 120 $^{\circ}\text{C}$ at 1 watt | |
| Ambient Temperature Range | | -65 to 160 $^{\circ}\text{C}$ | |

Note 1: To dissipate full rated power forced air cooling must be provided to restrict the maximum body temperature to 180 $^{\circ}\text{C}$.

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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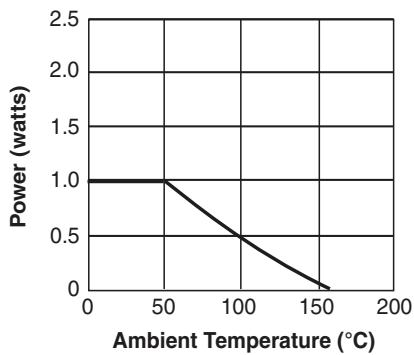
SP20/SP20F Series **NOT RECOMMENDED FOR NEW DESIGNS**

Performance Data

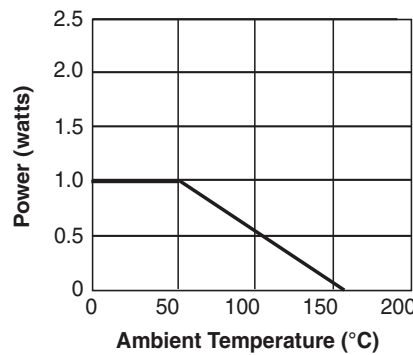
| Test | | SP20 | SP20F |
|---------------------------------|--------|----------------------|-----------------------|
| Temperature coefficient (ppm) | ppm/°C | <1R ±800 ≥1R ±150 | <1R ±800* ≥1R ±150 |
| Dielectric withstanding voltage | RMS | 700V | |
| Momentary overload | % | 5 | |
| Low temperature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

*0.1 ohm SP20F <1000 ppm.

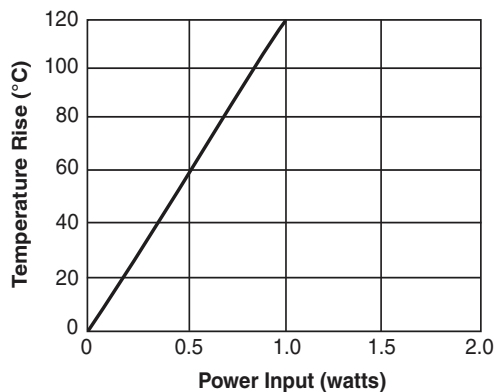
SP-20 Power Derating Curve



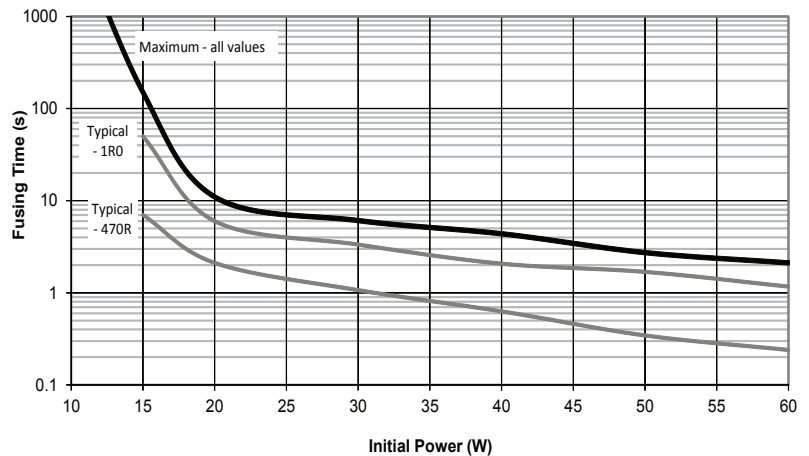
SP-20F Power Derating Curve



SP-20 and SP20F Temperature Rise Chart



SP20F Fusing Characteristic (Maximum & Typical Fusing Times)



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BI Technologies IRC Welwyn

www.ttelectronics.com/resistors

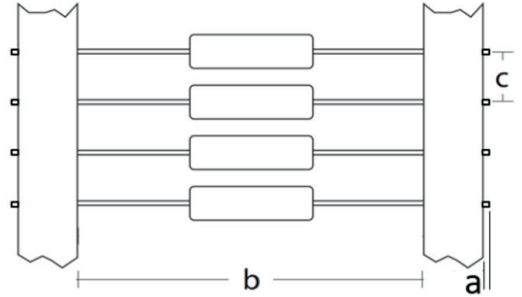
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Packaging

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 |
| SP20, SP20F | 0.43 (10.9) | 2.062±0.062 (52.4±1.6) | 0.2±0.015 (5.1±0.4) |



Ordering Procedure

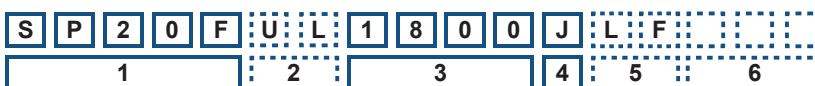
This product has two valid part numbers:

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



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

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



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

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