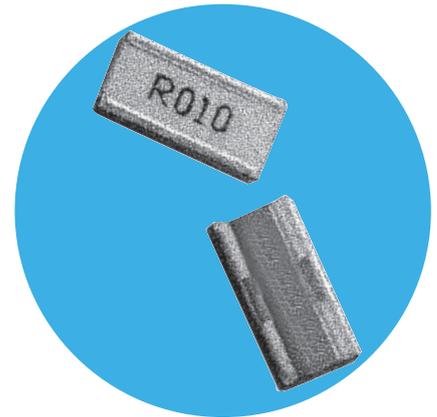


Low Value 3W Chip Resistors

LRF3W Series

- 3W in 1225 package
- Resistance range from 0.003 to 0.1Ω
- Tolerances to ±1%
- AEC-Q200 Qualified
- Low thermal impedance
- Wide terminations enhance robustness
- RoHS compliant and SnPb variants



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

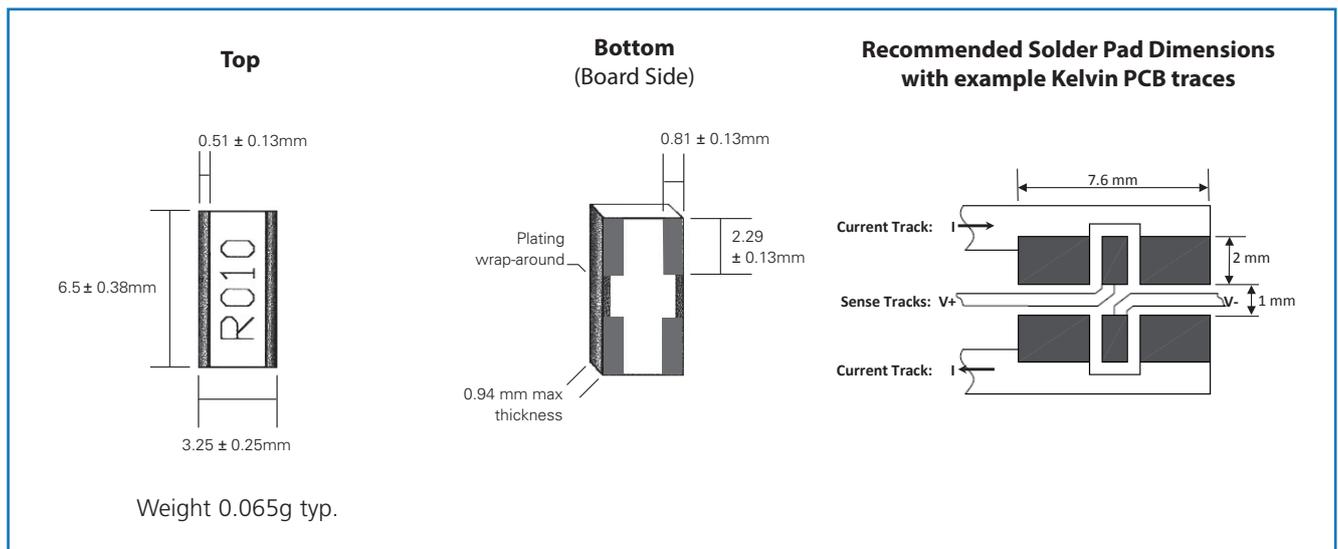
Electrical Data

| | | LRF3W |
|-------------------------------|-----------------|----------------------------|
| Power rating @70°C | watts | 3 |
| Resistance range ¹ | ohms | R003 to R10 |
| Resistance tolerance | % | <R004: 5, ≥R004: 1, 2, 5 |
| TCR | ppm/°C | <R004: ±550, ≥R004: ±100 |
| Dielectric withstand | volts | 200 |
| Ambient temperature range | °C | -55 to +150 |
| Values | | E24 preferred ² |
| Pad / trace area ³ | mm ² | 500 |

Note 1: Contact factory for values outside this range. Note 2: Many values = N x R001 and N x R005 up to N=10 are also available.

Note 3: Recommended minimum pad & adjacent trace area for each termination for rated dissipation on FR4 PCB

Physical Data



General Note

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LRF3W Series

Construction

Patented non-noble copper based thick film material and organic protection are screen printed on a 96% alumina substrate. The components are laser trimmed to achieve the required resistance tolerance.

Terminations

The wrap-around terminations have an electroplated nickel barrier and matte tin finish, this ensures excellent 'leach' resistance properties and solderability.

Chips can withstand immersion in solder at 250°C for 90 seconds and are suitable for reflow or wave soldering mounting applications.

Marking

The body protection and marking are resistant to all normal industrial cleaning solvents suitable for printed circuits. Chips are packed and mounted with marking side up. The LRF3W Chips are mounted with the actual resistor element mounted face down on its termination pads.

Performance Data

| AEC-Q200 Table 7 | | Method | Max. (add R05) | | Typ. (@R20) |
|------------------|--------------------------------|-------------------------|----------------|---------------|-------------|
| ref | Test | | | | |
| 3 | High Temp. Exposure | MIL-STD-202 Method 108 | ΔR% | 0.5 | 0.2 |
| 4 | Temperature Cycling | JESD22 Method JA-104 | ΔR% | 0.25 | 0.1 |
| 6 | Moisture Resistance | MIL-STD-202 Method 106 | ΔR% | 0.5 | 0.2 |
| 7 | Biased Humidity | MIL-STD-202 Method 103 | ΔR% | 0.5 | 0.2 |
| 8 | Operational Life (Cyclic Load) | MIL-STD-202 Method 108 | ΔR% | 1 | 0.5 |
| 14 | Vibration | MIL-STD-202 Method 204 | ΔR% | 0.5 | 0.05 |
| 15 | Resistance to Soldering Heat | MIL-STD-202 Method 210 | ΔR% | 0.25 | 0.05 |
| 16 | Thermal Shock | MIL-STD-202 Method 107 | ΔR% | 0.25 | 0.1 |
| 18 | Solderability | J-STD-002 | | >95% coverage | |
| 21 | Board Flex | AEC-Q200-005 | ΔR% | 0.5 | 0.2 |
| 22 | Terminal Strength | AEC-Q200-006 | ΔR% | 0.25 | 0.1 |
| | Short Term Overload | 6.25 x Pr for 2s | ΔR% | 0.5 | |
| | Low Temperature Storage | -65°C for 100 hours | ΔR% | 0.5 | |
| | Shelf Life Test | Room temp for 12 months | ΔR% | 0.1 | |
| | Leach Resistance | Solder dip at 250°C | | 90s minimum | |

Notes:

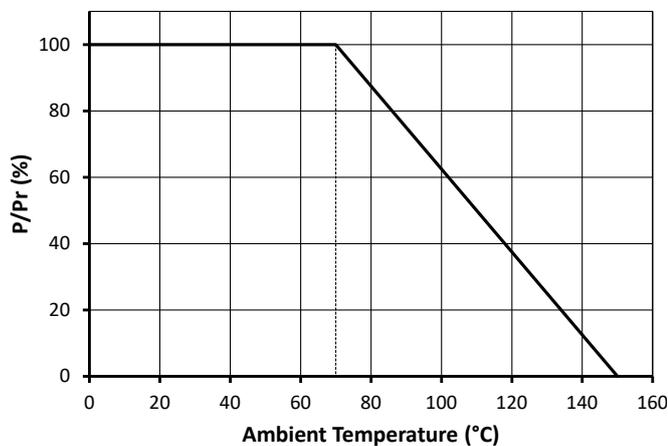
- 1. Full AEC-Q200 qualification applies to ohmic values $\square \geq R02$.

Packaging

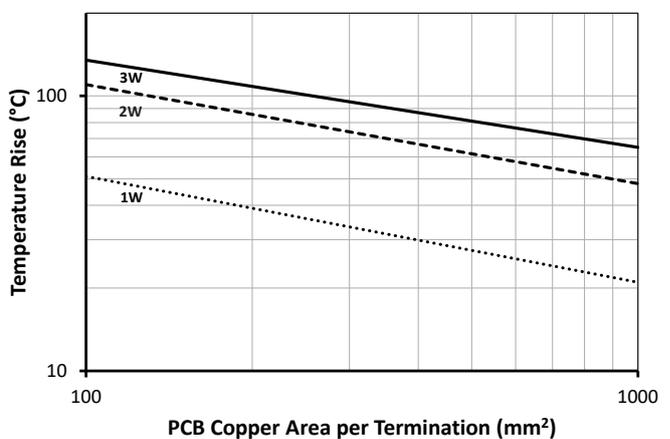
LRF3W Resistors are supplied taped and reeled as per IEC 286-3. The standard quantity per reel is 1800 parts.

Thermal Data

Temperature Derating



Temperature Rise

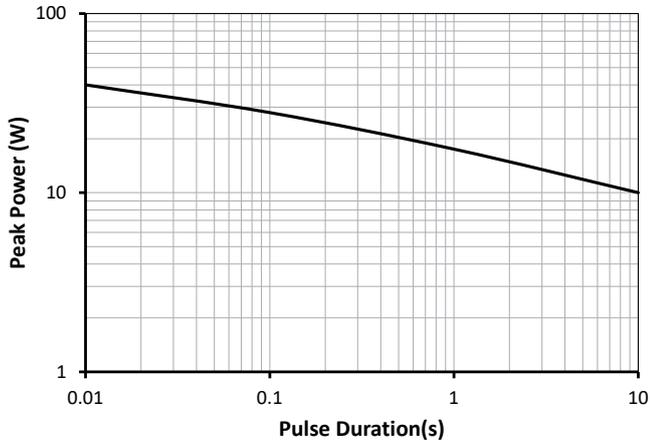


General Note

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LRF3W Series

Pulse Power Data



Ordering Procedure

This product has two valid part numbers:

European (Welwyn) Part Number: LRF3W-R02FW (20 milliohms $\pm 1\%$, Pb-free)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L | R | F | 3 | W | - | R | 0 | 2 | F | W |
| 1 | | | | 2 | | 3 | | 4 | | |

| 1 | 2 | 3 | 4 | |
|-------|----------------------------------|---------------|--|-------------------------------|
| Type | Value | Tolerance | Termination & Packing | |
| LRF3W | E24 = 3/4 characters R = ohms | F = $\pm 1\%$ | W | Pb-free, standard packing |
| | | G = $\pm 2\%$ | PB | SnPb finish, standard packing |
| | | J = $\pm 5\%$ | Standard packing is tape & reel, 1800/reel | |

USA (IRC) Part Number: LRC-LRF3WLF-01-R020-F (20 milliohms $\pm 1\%$, Pb-free)

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | R | C | - | L | R | F | 3 | W | L | F | - | 0 | 1 | - | R | 0 | 2 | 0 | - | F |
| 1 | | 2 | | | | 3 | | 4 | | 5 | | | | 6 | | | | | | |

| 1 | 2 | 3 | 4 | 5 | 6 |
|--------|-------|---------------|----------------------------------|--------------------------|---------------|
| Family | Model | Termination | TCR | Value | Tolerance |
| LRC | LRF3W | Omit for SnPb | 01 = ± 100 ppm/ $^{\circ}$ C | 4 characters R = ohms | F = $\pm 1\%$ |
| | | LF = Pb-free | | | G = $\pm 2\%$ |
| | | | | | J = $\pm 5\%$ |

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