

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

Top

Weight 0.065g typ.

Bottom (Board Side)

Recommended Solder Pad Dimensions with example Kelvin PCB traces

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability.

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Construction

Patented non-noble copper based thick film material, overglaze 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:

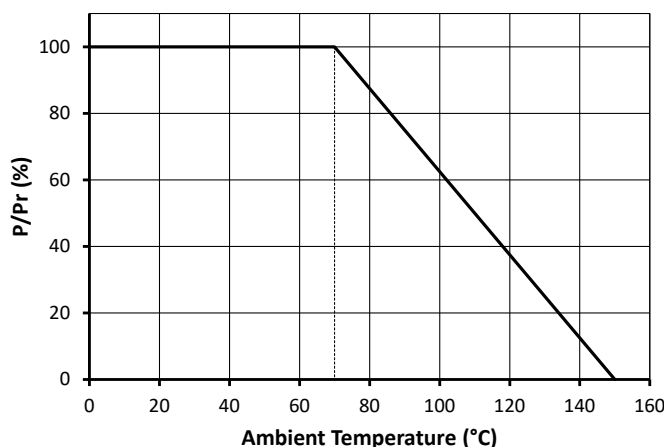
- 1. Full AEC-Q200 qualification applies to ohmic values ≥R02.

Packaging

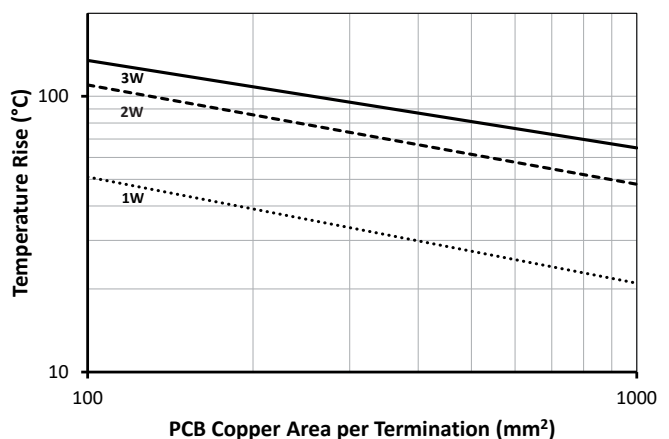
LRF3W Resistors are supplied taped and reeled as per IEC 286-3. The standard quantity per reel is 1800 parts.

Thermal Data

Temperature Derating



Temperature Rise

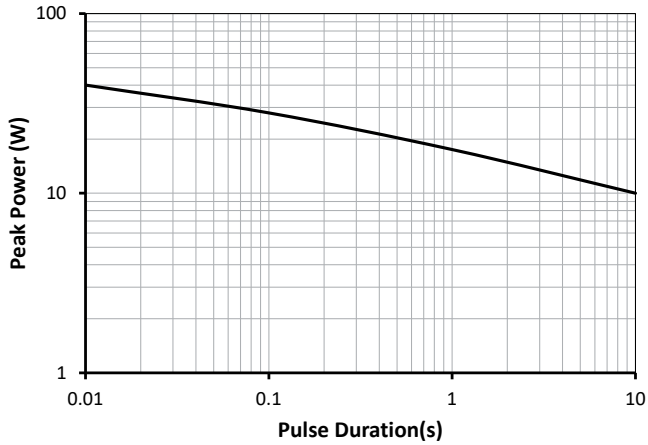


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Pulse Power Data



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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