Low Value 4W Chip Resistors

LRF4W Series

Provisional

Features:

- 4W in 1225 package
- Resistance range from 3 to 100mΩ
- Tolerances to ±1%
- AEC-Q200 qualified
- Low thermal impedance
- Wide terminations to enhance robustness

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

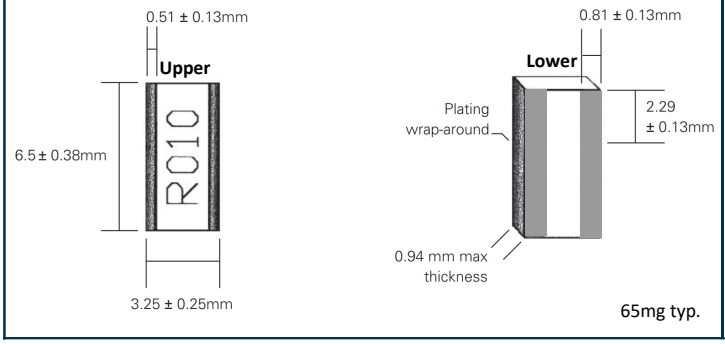
Electrical Data

		LRF4W
Power rating at 70°C	W	4
Resistance range	Ω	R003 to R10
Resistance tolerance	%	<R004: 5, ≥R004: 1, 2, 5
TCR	ppm/°C	<R004: ±550, ≥R004: ±100
Dielectric withstand	V	200
Standard values		E24 and integer multiples of R001 up to R01, of R005 up to R05 and of R01 preferred
Ambient temperature range	°C	-55 to +150
Pad / trace area [1]	mm²	500

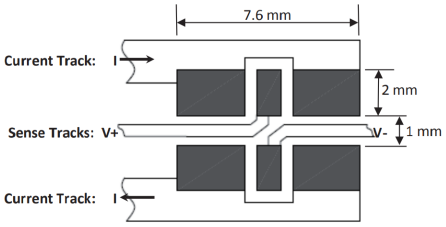
Note 1: Recommended minimum pad & adjacent trace area for each termination for rated dissipation on FR4 PCB

Physical Data

Dimensions and weight



Mounting Pad Dimensions and Example Kelvin Tracking



Construction

Proprietary 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 or tin - lead 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 solder mounting processes.

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.

Processing

LRF4W chips are placed on the termination pads with the actual resistor element mounted face down. For reflow of LRF4W parts, a solder paste thickness of not less than 100µm is recommended.

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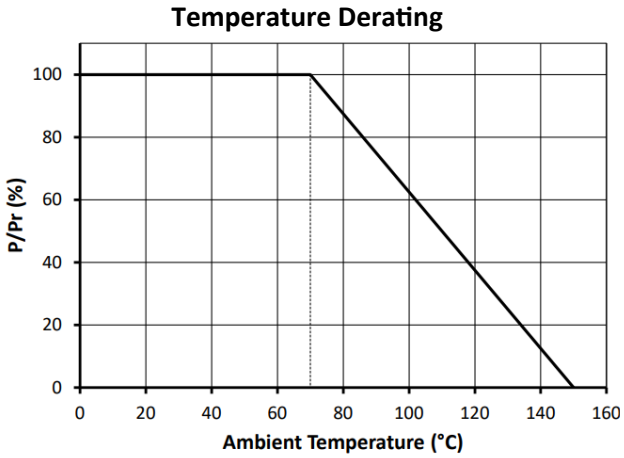
Performance Data

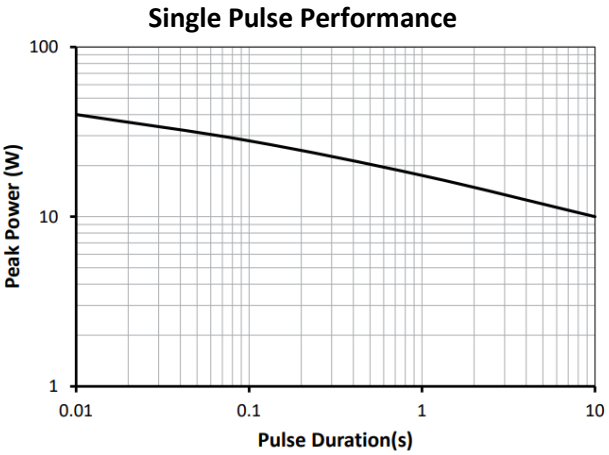
AEC-Q200 Table 7 Reference	Test	Method		Maximum (add R05)	Typical (@R20)
3	High temperature exposure	MIL-STD-202 Method 108	±ΔR%	0.5	0.2
4	Temperature cycling	JESD22 Method JA-104	±ΔR%	0.25	0.1
6	Moisture resistance	MIL-STD-202 Method 106	±ΔR%	0.5	0.2
7	Biased humidity	MIL-STD-202 Method 103	±ΔR%	0.5	0.2
8	Operational life (cyclic load)	MIL-STD-202 Method 108	±ΔR%	3	1
14	Vibration	MIL-STD-202 Method 204	±ΔR%	0.5	0.05
15	Resistance to solder 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%	2	-
	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	

Note: Full AEC-Q200 qualification applies to ohmic values ≥R02

Thermal Data



Pulse Data



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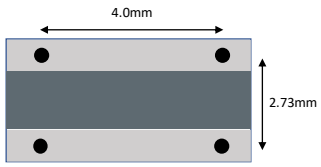
Value Measurement

LRF4W resistors are measured using 4-terminal probes on the lower side of the chip, centred on the chip and at the spacings shown below.



Packaging

LRF4W resistors are supplied taped and reeled as per IEC 286-3. The standard quantity per reel is 1800 parts. For full details of tape and reel dimensions see:
https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Application-Note/PS003-Packing-of-Specialist-Chip-Resistors.pdf

Ordering Procedure

Example: LRF4W-R02FT18 (20mΩ ±1%, Pb-free)

L	R	F	4	W	-	R	0	2			F	T	1	8	
1						2					3	4			

1 Type	2 Value	3 Tolerance	4 Termination & Packing			
LRF4W	E24 =3-5 characters R = ohms	F = ±1%	T18	Pb-free	1800/reel	Standard packing
		G = ±2%	PB	SnPb finish		
		J = ±5%	T1	Pb-free	1000/reel	Non-standard packing
			T1PB	SnPb finish		

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