High Current Jumper Chip

LRZ Series

Features:

- High current zero-ohm link
- Thick film copper technology
- Current rating to 35A
- Typical resistance 1.5mΩ
- Inductance below 0.2nH
- AEC-Q200 qualified

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

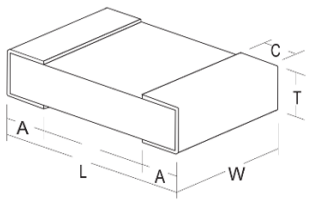
Electrical Data

		0603	0805	1206	2010	2512
Current rating at 70°C	A (dc or RMS)	6	15	20	30	35
Overload current, 2 seconds at 25°C	A (dc or RMS)	12	30	40	60	70
Residual resistance	mΩ	Maximum: 3, Typical: 1.5				
Ambient temperature range	°C	-55 to 150				
Dielectric withstand voltage	V	200				
Temperature rise at rated current	°C	15	30	40	80	90
Pad / trace area for rated current[1]	mm^2	40	40	50	100	300

Note 1: Recommended minimum pad & adjacent trace area for each termination for rated current on FR4 PCB. See Application Notes.

Physical Data

Dimensions in mm and weight in mg						
	L	**W**	**T**	**A**	**C**	**Wt.** nom.
0603	1.6 ±0.3	0.8 ± 0.2	0.5 ± 0.1	0.3 ± 0.15	0.25 ± 0.15	3
0805	2 ± 0.3	1.25 ± 0.2	0.61 ± 0.1		0.3 ± 0.15	9
1206	3.2 ± 0.31	1.63 ± 0.2		0.48 ± 0.25	0.48 ± 0.25	20
2010	5.23 ± 0.38	2.64 ± 0.25	0.74 ± 0.1			36
2512	6.5 ± 0.38	3.25 ± 0.25				55



Construction

A thick film copper conductive element and organic protection are screen printed on a 96% alumina substrate.

Terminations

The wrap-around copper 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 30 seconds and are suitable for reflow or wave solder mounting processes.

Marking

The body protection is resistant to all normal cleaning solvents suitable for printed circuits. 1206 and larger size chips are marked R000. 0603 and 0805 sizes are not marked.

Processing

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

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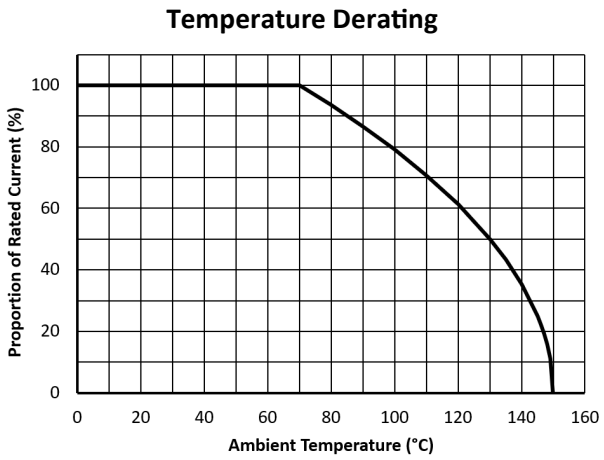
Performance Data

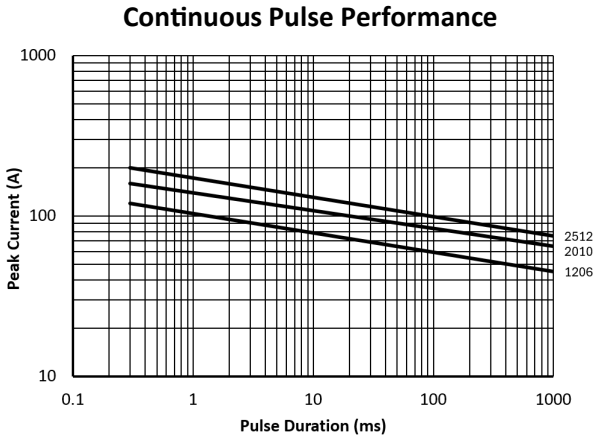
AEC-Q200 Table 7 Reference	Test	Method	Result
3	High temperature exposure	MIL-STD-202 Method 108	Pass [1]
4	Temperature cycling	JESD22 Method JA-104	Pass [1]
6	Moisture resistance	MIL-STD-202 Method 106	Pass [1]
7	Biased humidity	MIL-STD-202 Method 103	Pass [1]
8	Operational life (cyclic load)	MIL-STD-202 Method 108	Pass [1]
14	Vibration	MIL-STD-202 Method 204	Pass [1]
15	Resistance to solder heat	MIL-STD-202 Method 210	Pass [1]
16	Thermal shock	MIL-STD-202 Method 107	Pass [1]
18	Solderability	J-STD-002	>95% coverage
21	Board flex	AEC-Q200-005	Pass [1]
22	Terminal strength	AEC-Q200-006	Pass [1]
	Leach resistance	Solder dip at 250°C	90s minimum

Note 1: AEC-Q200 qualification based on testing of structurally similar LRF Series low value chip resistors, of which LRZ is the zero-ohm version. ΔR measurements are not applicable to the zero-ohm version.
Note 2: Although 2010 and 2512 sizes have passed temperature cycling and thermal shock, it is in general not recommended that ceramic chips this large be used on FR4 in a severe temperature cycle environment due to the possibility of solder joint fatigue.
Note 3: Full AEC-Q200 qualification applies to sizes 0603, 1206, 2010 and 2512

Thermal Data



Pulse Data



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Application Notes

Conventional thick film zero-ohm jumper chips typically have up to 50mΩ resistance values and 1 to 2A current ratings. LRZ jumper chips offer a solution for currents over an order of magnitude greater by combining lower resistance values with better thermal conductivity.

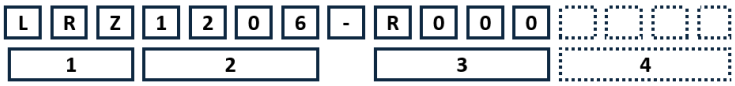
Care should be taken when designing the associated printed circuit board tracks to ensure that they can carry the required current without excessive heating, for example by using multiple layers thermally linked with many vias. Any temperature rise caused by power dissipated in the PCB tracks themselves should be allowed for when calculating the ambient temperature in order to determine whether current de-rating should be applied.

The minimum recommended pad and trace areas close to the chip which are stated under Electrical Data should be provided at each terminal. Pad and trace area close to the resistor is defined as being the total copper area within two squares of the edge of the solder pad, plus the solder pad area. For multi-layer PCBs, this minimum area requirement should be met by surface layers rather than buried layers. The actual solder pad area follows the normal design rules for chip resistors.

LRZ jumper chips themselves can operate at a maximum temperature of 150°C. For conventionally soldered jumper chips, the joint temperature should not exceed 110°C. This condition is met when the stated current levels at 70°C are used.

Ordering Procedure

Global Part Number Example: LRZ1206-R000 (1206, Pb-free)

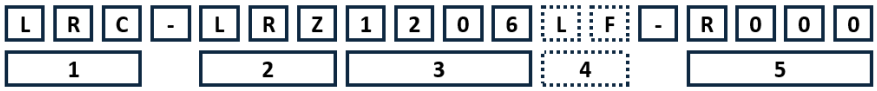


1 Type	2 Size	3 Value	4 Termination & Packing	
LRZ	0603	R000	Omit for Pb-free, standard packing	
	0805		T1	Pb-free, 1000/reel (non-standard)
	1206		PB	SnPb finish, standard packing
	2010		T1PB	SnPb finish, 1000/reel (non-standard)
	2512		Standard packing is tape & reel	
			0603	5000/reel
			0805, 1206 & 2010	3000/reel
			2512	1800/reel

Legacy Part Numbers

This product has a legacy part number format for size 1206 and larger. This is still available for ordering, but for new designs use of the Global Part Number is recommended.

Legacy Part Number Example: LRC-LRZ1206LF-R000 (1206, Pb-free)



1 Family [2]	2 Model	3 Size [1]	4 Termination	5 Value	Packing	
LRC	LRZ	1206	Omit for SnPb	R000	Standard packing is tape & reel	
		2010	LF = Pb-free		1206 & 2010	3000/reel
		2512			2512	1800/reel

Note 1: Sizes 0603 & 0805 are only available under global part numbering.
Note 2: It is always advisable to include the family prefix in the legacy part number, and it is essential to do so when ordering SnPb termination parts, otherwise the part number is indistinguishable from the global part number for Pb-free standard packed parts.