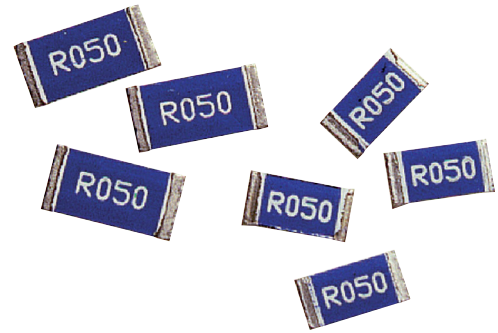


LR Series

Features

- Standard 2512, 2010 and 1206 sizes
- Resistance values down to 0.003 ohms
- Leach resistant solder-plated copper wrap-around termination
- AEC-Q200 Qualified
- RoHS compliant and SnPb variants



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

Electrical

		LR1206	LR2010	LR2512
Power rating at 70°C	watts	0.5	1.0	1.5/2.0*
Resistance range	ohms	0R010 to 1R	0R003 to 1R	0R003 to 1
Dielectric withstanding voltage	volts	200	200	200
Resistance range ¹		±100 (Contact factory for value below 0.050 ohms)		
Resistance tolerance	ppm/°C	≤R005 5%, >R005 1, 2, 5%		
TCR	%	≤R005 5%, >R005 1, 2, 5%		
Dielectric withstanding voltage	°C	40	80	90
Ambient temperature	mm²	30	30	100
Pad and trace area for max power rating @ 70°C				
Values	*2 Watts with total solder pad and trace size of 300 mm²			
Temperature rise at rated power	°C	40	80	90
Pad / trace area ³	mm²	30	100	300

Physical Data

Note 1: Contact factory for value – tolerance combinations outside this range. Note 2: Many values = N x R001 and N x R005 up to N=10 are also available. Note 3: Resistance values are marked on the chip.

Physical

Dimensions (mm)					
Size	L	W	H (max)	D	
LR1206	3.20±0.305	1.63±0.20	0.8	0.48±0.25	
LR2010	5.23±0.38	2.64±0.25	0.84	0.48±0.25	
LR2512	6.50±0.38	3.25±0.25	0.84	0.48±0.25	
LR(F)1206	3.20±0.305	1.63±0.20	0.8	0.6 ±0.25	
LR(F)2010	5.23±0.38	2.64±0.25	0.84	0.6 ±0.25	
LR(F)2512	6.50±0.38	3.25±0.25	0.84	0.6 ±0.25	

Note: LRF construction is identical except that Resistive Element and Protective Overcoat are on the underside of the chip.

Recommended Solder Pad Dimensions (mm)				Marking
	A	B	C	
LR(F)1206	2.0	4.0	1.25	LR parts are marked in white on the upper blue surface, whilst LRF parts are marked in black on the upper white surface. Parts are marked with the value code, where this is up to four characters (e.g. "R025"). For five character value codes the value in milliohms is marked, with "m" indicating decimal position (e.g. "2m5" for value code R0025). Processing For reflow of LRF parts, a solder paste thickness of 100µm is recommended.
LR(F)2010	2.0	6.5	1.5	
LR(F)2512	3.7	7.75	1.5	

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General Note

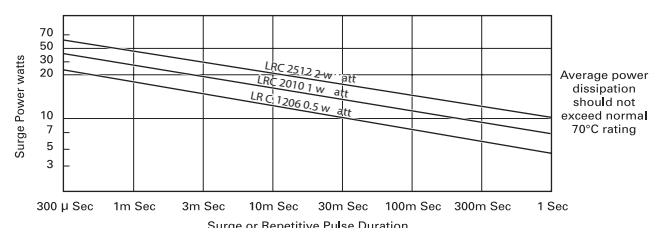
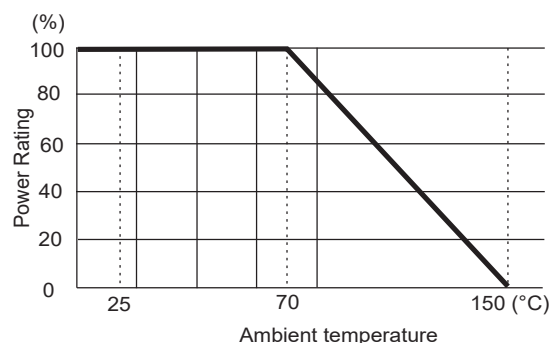
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Performance Data

AEC-Q200 Table 7					
ref	Test	Method	Max. (add R05)	Typ. (@1R0)	
3	High Temp. Exposure	MIL-STD-202 Method 108	$\Delta R\%$ 0.5	0.2	
4	Temperature Cycling	JESD22 Method JA-104	$\Delta R\%$ 0.25	0.1	
6	Moisture Resistance	MIL-STD-202 Method 106	$\Delta R\%$ 0.5	0.2	
7	Biased Humidity	MIL-STD-202 Method 103	$\Delta R\%$ 0.5	0.2	
8	Operational Life (Cyclic Load)	MIL-STD-202 Method 108	$\Delta R\%$ 1	0.5	
14	Vibration	MIL-STD-202 Method 204	$\Delta R\%$ 0.5	0.05	
15	Resistance to Soldering Heat	MIL-STD-202 Method 210	$\Delta R\%$ 0.25	0.05	
16	Thermal Shock	MIL-STD-202 Method 107	$\Delta R\%$ 0.25	0.1	
18	Solderability	J-STD-002	>95% coverage		
21	Board Flex	AEC-Q200-005	$\Delta R\%$ 0.5	0.2	
22	Terminal Strength	AEC-Q200-006	$\Delta R\%$ 0.25	0.1	
	Short Term Overload	6.25 x Pr for 2s	$\Delta R\%$ 0.5		
	Low Temperature Storage	-65°C for 100 hours	$\Delta R\%$ 0.5		
	Leach Resistance	Solder dip at 250°C	90s minimum		



Note:

1. 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.

Full AEC-Q200 qualification applies only to ohmic values $\geq R01$.

Ordering Procedure

This product has two valid part numbers:

European (Welwyn) Part Number: LRF1206-R02FW (1206, 20 milliohms $\pm 1\%$, Pb-free)

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

1 Type	2 Size	3 Value	4 Tolerance	5 Termination & Packing
LR = Conventional orientation (values $\geq R025$)	1206	E24 = 3/4 characters R = ohms	F = $\pm 1\%$	W Pb-free, standard packing
	2010		G = $\pm 2\%$	T1 Pb-free, 1000/reel (non-standard)
LRF = Flip-chip orientation (values $\leq R025$)	2512		J = $\pm 5\%$	PB SnPb finish, standard packing
				T1PB SnPb finish, 1000/reel (non-standard)
				Standard packing is tape & reel
				1206 & 2010 3000/reel
	2512			1800/reel

USA (IRC) Part Number: LRC-LRF1206LF-01-R020-F (1206, 20 milliohms $\pm 1\%$, Pb-free)

L	R	C	-	L	R	F	1	2	0	6	L	F	-	0	1	-	R	0	2	0	-	F	
1				2			3			4				5				6			7		

1 Family	2 Model	3 Size	4 Termination	5 TCR	6 Value	7 Tolerance	Packing		
LRC	LR = Conventional orientation (values $\geq R025$)	1206	Omit for SnPb	01 = standard ($\pm 100\text{ppm}/^\circ\text{C}$ values $\geq R05$)	4 characters R = ohms	F = $\pm 1\%$	Standard packing is tape & reel		
		2010	LF = Pb-free			G = $\pm 2\%$	Pb-free	All sizes	1000/reel
	LRF = Flip-chip orientation (values $\leq R025$)	2512				J = $\pm 5\%$	SnPb	1206 & 2010 2512	3000/reel 1800/reel

General Note

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