





## ABOUT OUR COMPANY

LartronicS, Inc. has been satisfying the precision wirewound resistor needs of the San Francisco Bay area since 1970. We have built our company on the philosophy that only quality workmanship utilizing proven materials and procedures will ensure a consistently reliable and stable product.

Upon its inception, LartronicS, Inc. developed two techniques which were unique to the wirewound resistor community. Each was designed to produce a high quality product with a fast turnaround time.

To maintain this quality, LartronicS, Inc. carries on an intensive quality control program. Each resistor is checked for quality numerous times throughout the production process on highly sophisticated, advanced technological measuring systems. With this program, LartronicS, Inc. has experienced an extremely low reject rate. This assures you of the most reliable and stable product possible.

Research and development has gone hand in hand with our quality control program. Extensive testing of our resistors has kept us abreast of any areas that needed improvement, or pointed to possible trouble spots before they developed into major problems for our customers. Each test has further confirmed our dedication to quality.

So when your specifications call for a high quality resistor, with excellent accuracy, reliability, and precision, call LartronicS, Inc.



## ORDERING INFORMATION

When ordering, please indicate your needs as follows:

- Resistor part number
  - Resistance value
  - Resistance tolerance
- Where applicable, also indicate:
- Temperature coefficient required
  - Wattage or applied voltage
  - Special dimensions

*Example:* LR 10, 10K,  $\pm .01\%$   
or LR P5, 200 $\Omega$ ,  $\pm 5\%$

**Phone (408) 379-6454 • FAX (408) 379-6576**

## SURFACE MOUNT WIREWOUND RESISTORS

	Lartronics Type	Comm. Watt	A Max.	B Max.	C Max.	Lead D		Stand-Off		F ±.010"
						TK ±.003"	W± .020"	E (Diam.)	HT	
	LS.5	0.50	.210	.130	.110	.006	.060	.100	.005	.040
	LS1	1.00	.275	.150	.130	.006	.070	.120	.005	.070
	LS2	2.00	.475	.250	.180	.006	.120	.190	.005	.100
	LS4	4.00	.820	.295	.280	.006	.150	.245	.005	.190
	LL1	1.00	.275	.150	.100	.006	.070	.120	.005	.070
	LL2	2.00	.475	.250	.100	.006	.120	.190	.005	.100

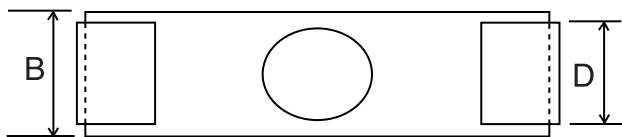
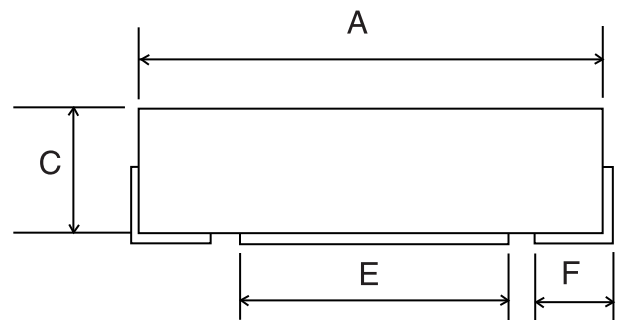
- Molded construction
- All welded terminations
- Dielectric withstanding voltage, 500 volts AC, minimum
- Non-inductive winding available
- Tape and reel per EIA 481-3 available

### Resistance Range:

LS.5—.1 ohm to 400 ohm  
 LS1—.1 ohm to 1K ohm  
 LS2—.1 ohm to 10K ohm (Consult factory for other resistance values).

### Temperature Coefficients:

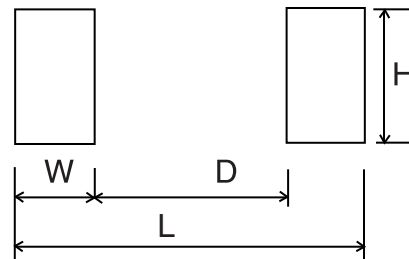
0.1 ohm – 0.99 ohm = ± 90 ppm/°C  
 1 ohm – 9.9 ohm = ± 50 ppm/°C  
 10 ohm + UP = ± 20 ppm/°C



## ENVIRONMENTAL SPECIFICATIONS

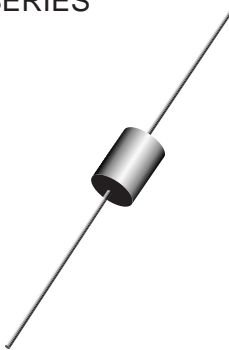
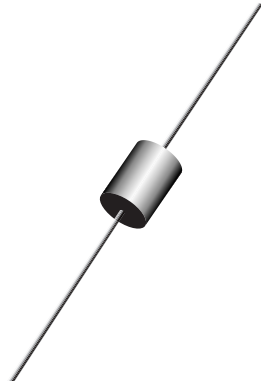
Per MIL – STD-202	Maximum ΔR
Load life at rated wattage	= 1%
Moisture resistance	= 1%
Method 106	
Load/No load	
Temperature cycle	= .5%
–40°C to +125°C	
Method 107D	
Test condition B	
Short time overload	= .5%
5 × rated wattage, 5 seconds	
Low temperature storage	= .5%
MIL-R-26	
Solder heat	= .25%
Shock	= .5%
Method 213	
Vibration	= .5%
Method 204	

### Foot Print – Grid Pattern



## PRECISION WIREWOUND RESISTORS

### AXIAL SERIES


AXIAL SUBMINIATURE SERIES 	Lartronics Type	Comm. Watt	Max. Volt.	Max. Resis.	Min. ± Tol	Diam. ± .005"	Leng. ± .025"	Lead AWG*	Diam. MM	Leng. MM
	LR0	.060	75	50K	.100%	.100	.210	24	2.5	5.3
	LR00	.100	100	150K	.050%	.125	.260	24	3.2	6.6
	LR02	.100	100	250K	.050%	.125	.375	24	3.2	9.5
	LR03	.100	100	250K	.050%	.156	.312	24	4.0	7.9
	LR04	.125	150	400K	.010%	.187	.250	22	4.7	6.3
	LR06	.150	150	500K	.010%	.187	.295	22	4.7	7.5
	LR01	.175	200	750K	.005%	.187	.375	22	4.7	9.5
	LR07	.200	200	750K	.005%	.187	.450	22	4.7	11.4
	LR08	.250	250	1.0M	.005%	.210	.465	22	5.3	11.8
AXIAL MINIATURE SERIES 	Lartronics Type	Comm. Watt	Max. Volt.	Max. Resis.	Min. ± Tol	Diam. ± .025"	Leng. ± .025"	Lead AWG*	Diam. MM	Leng. MM
	LR09	.25	200	800K	.005%	.250	.375	20/22	6.3	9.5
	LR10	.33	300	1.2 M	.005%	.250	.500	20/22	6.3	12.7
	LR15	.50	400	2.5 M	.005%	.250	.750	20/22	6.3	19.1
	LR16	.50	300	3.0 M	.005%	.375	.500	20	9.5	12.7
	LR17	.50	400	6.0 M	.005%	.375	.750	20	9.5	19.1
	LR18	.50	400	7.5 M	.005%	.375	.885	20	9.5	22.4
	LR19	.50	400	7.0 M	.005%	.500	.500	20	12.7	12.7
	LR21	.75	400	7.0 M	.005%	.500	.625	20	12.7	15.9
	LR20	1.00	600	10.0 M	.005%	.375	1.000	20	9.5	25.4
	LR30	1.00	800	12.0 M	.005%	.500	1.000	20	12.7	25.4
	LR35	1.50	900	15.0 M	.005%	.500	1.500	20	12.7	38.1
LR40	2.00	1000	25.0 M	.005%	.500	2.000	20	12.7	50.8	

\* Lead Diameter AWG/(DEC.): 20/(.032"); 22/(.025"); 24/(.020").

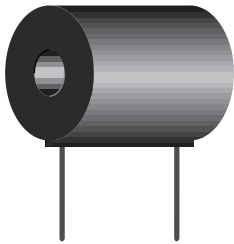
Consult factory for additional sizes and information.

## PRECISION WIREWOUND RESISTORS

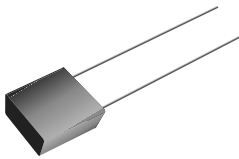
### PRINTED CIRCUIT SERIES

	Lartronics Type	Comm. Watt	Max. Volt.	Max. Res.	Min. ± Tol	Diam. ± .005"	Leng. ± .025"	Lead Diam.	Lead Spacing ± .010"
	LPC1	.125	150	500K	.010%	.250	.312	AWG 22	.150
	LPC2	.125	150	500K	.010%	.250	.312	AWG 22	.200
	LPC09	.250	150	500K	.010%	.250	.375	AWG 22	.150
	LPC10	.330	150	600K	.005%	.250	.500	AWG 22	.150
	LPC16	.500	300	800K	.005%	.375	.500	AWG 20	.200
	LPC19	.500	400	1.0M	.005%	.500	.500	AWG 22	.300

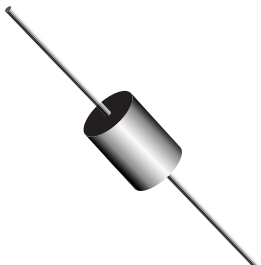
### RADIAL LEAD AND LUG

	Lartronics Type	Comm. Watt	Max. Volt.	Max. Res.	Min. ± Tol	Diam. .025"	Leng. ± .025"	Type Term.	Term. Spac.	Mount Hole
	L05RL	.125	100	500K	.010%	.250	.250	AWG 22	.200	None
	L10RL	.330	150	750K	.005%	.250	.500	AWG 22	.400	None
	L17RL	.500	300	1.0M	.005%	.375	.750	AWG 20	.600	#6 Screw
	L19RL	.500	400	4.0M	.005%	.500	.500	AWG 20	.400	#6 Screw
	L30RL	1.000	800	8.0M	.005%	.500	1.000	AWG 20	.850	#6 Screw
	L19L	.500	400	4.0M	.005%	.500	.500	LUG	.325	#6 Screw

### RECTANGULAR SERIES

	Lartronics Type	Comm. Watt	Max. Resis.	Dimensions ± .010" ± .010" ± .025"	Max. Volt.	Lead Spac. ± .010"	Lead Diam. AWG*/(DEC.)
	LRS 11	.125	500K	.140 × .250 × .250	150	.125	#20/(.032)
	LRS 12	.250	750K	.140 × .250 × .500	150	.250	#20/(.032)
	LRS 13	.125	500K	.110 × .300 × .320	150	.150	#22/(.025)

### FAST RISE SERIES

	Lartronics Type	Comm. Watt	Max. Volt.	Max. Resis.	Min. ± Tol	Diam. ± .025"	Leng. ± .025"	Lead AWG*	Diam. MM	Leng. MM
	FLR01	.175	200	500K	.01%	.187	.375	22	4.7	9.5
	FLR10	.330	300	1.0M	.01%	.250	.500	20	6.3	12.7
	FLR15	.500	400	1.25M	.01%	.250	.750	20	6.3	19.1
	FLR17	.500	400	5.0M	.01%	.375	.750	20	9.5	19.1
	FLR30	1.000	800	10.0M	.01%	.500	1.000	20	12.7	25.4

\* Lead Diameter AWG/(DEC.): 20/(.032"); 22/(.025").

Consult factory for additional sizes and information.

## PRECISION WIREWOUND RESISTORS

### STANDARD FEATURES

#### **Bobbins:**

All epoxy bobbins and shells are made from turned epoxy rod or are transfer molded from equivalent granular epoxies. These materials are compatible with encapsulation materials.

#### **Leads:**

60/40 tinned copper leads for low thermal E.M.F. are standard unless otherwise specified.

#### **Resistance Wire:**

Each resistor is wound from a single strand of wire with NO welded or soldered splices. Nickel-chromium wire such as Evanohm<sup>®</sup>, Manganin<sup>®</sup>, Moleculoy<sup>®</sup>, or C/O/J<sup>®</sup> is used exclusively.

#### **Windings:**

All windings are non-inductive wound, on reversed pi, segmented bobbins. All windings are relieved of stresses by extensive aging before calibration and termination operations. Controlled minimum tension is maintained for all windings.

#### **Encapsulation:**

Two encapsulation methods are used: transfer molding and epoxy impregnation. Both methods use high temperature epoxies compatible with bobbin material.

#### **Standard Color:**

Black

#### **Body Markings:**

All body markings are made from epoxy inks baked to full hardness to ensure that it is impervious to most solvents.

### OPTIONAL FEATURES\*

#### **Size:**

Additional sizes are available upon special request.

#### **Matched Resistor Pairs:**

Matched pairs can be ratio matched to .005% tolerance with an absolute tolerance of .01%.

#### **Special T.C.'s:**

Available from  $\pm 2\text{ppm}/^\circ\text{C}$  to  $+ 6000\text{ppm}/^\circ\text{C}$

#### **Tracking:**

Resistance tracking can be achieved within your specific temperature requirements.

#### **Temperature Sensing Resistors:**

Fast rise, low reactance.

\* Available in most temperature coefficients from  $+10\text{ppm}/^\circ\text{C}$  to  $+6000\text{ppm}/^\circ\text{C}$

### GENERAL SPECIFICATIONS

#### **Temperature Range, Working:**

$-65^\circ\text{C}$  to  $+145^\circ\text{C}$

#### **Temperature Range, Storage:**

$-65^\circ\text{C}$  to  $+175^\circ\text{C}$

#### **Temperature Coefficient:**

$\pm 10\text{ppm}/^\circ\text{C}$  (Lower ohmic values require slightly higher TC)

#### **Wattage Ratings:**

Based on  $125^\circ\text{C}$  ambient temperature

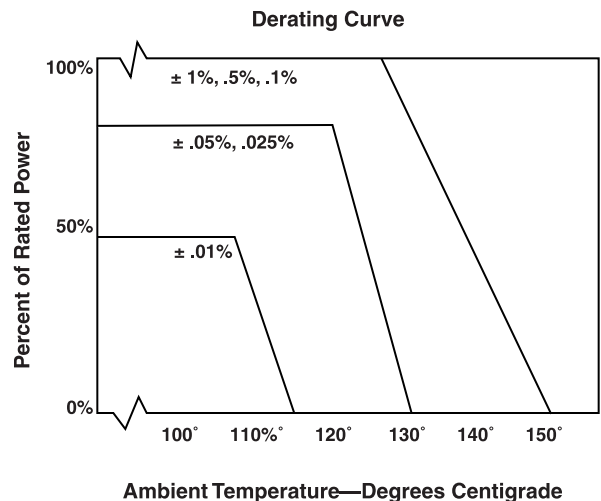
#### **Standard Tolerances:**

1%, .5%, .25%, .1%, .05%, .025%, .01%, .005%. (Other tolerances available on special request)

#### **Lead Length:**

Axial: 2 inches minimum

PC: 1 inch minimum



## POWER WIREWOUND RESISTORS



### POWER, PRECISION SILICONE COATED, WIREWOUND RESISTORS

Lartronics Type	MIL-R-26 MIL-R-39007	Wattage Rating		Maximum Resis. Lartronics MIL-R-26		Dimensions		Lead Dia. ± .002" AWG* C	Millimeters		Lead Dia. C mm
						Length A ± .062"	Dia. B ± .031"		Length A ± 1.6mm	Dia. B ± .8mm	
		U	V	Max.	Max.						
LRP-½A		.40	.50	2.5K		.220	.078	22/24	5.6	2.0	.58/.5
LRP-½		.75	.90	7.5K		.330	.078	24	8.4	2.0	.50
LRP-1	RW-70	1.00	1.25	10K	3.16K	.406	.094	22/24	10.3	2.4	.58/.5
LRP-2A	RW-69	2.50	3.00	22K	2.00K	.500	.187	20	12.7	4.8	.8
LRP-2		1.50	2.00	12K		.350	.156	22/20	9.1	3.9	.58/.8
LRP-3	RW-79	3.00	3.75	22K	10.5K	.560	.187	20	14.2	4.8	.8
LRP-3C		3.90	4.00	40K		.500	.250	20/18	12.7	6.3	.8/1.0
LRP-4		4.00	5.50	45K		.625	.250	20/18	15.8	6.3	.8/1.0
LRP-5	RW-74/RWR-74	5.00	6.50	91K	38.3K	.875	.312	18	22.2	8.0	1.0
LRP-5A		5.00	6.50	65K		.970	.203	20/18	24.2	5.1	1.0
LRP-7	RW-67	5.00	6.50	95K	8.20K	1±.094	.312	18	25.4	8.0	1.0
LRP-7A		7.00	9.00	150K		1.375	.375	18	35.0	9.5	1.0
LRP-10	RW-78/RWR-78	10.0	13.00	260K	90.90K	1.78	.375	18	45.2	9.5	1.0

### BERYLLIUM OXIDE CORES

Lartronics Type	MIL-R-26 MIL-R-39007	Wattage Rating		Maximum Resis. Lartronics MIL-R-26		Dimensions		Lead Dia. ± .002" AWG* C	Millimeters		Lead Dia. C mm
						Length A ± .062"	Dia. B ± .031"		Length A ± 1.6mm	Dia. B ± .8mm	
		U	V	Max.	Max.						
LR-B1	RW-81/RWR-81	1.0	1.5	3.4K	1.0K	.250	.085	24	6.4	2.2	.5
LR-B2	RWR-82	1.5	2.0	7.5K		.312	.078	24	7.9	2.0	.5
LR-B3	RW-80/RWR-80	2.0	3.0	10K	3.16K	.406	.094	20	10.3	2.4	.5
LR-B5	RWR-89	4.0	5.0	25K		.562	.188	20	14.3	4.8	.8
LR-B5C		5.0	7.0	32K		.500	.218	18	12.7	5.5	1.0
LR-B6		6.0	8.0	50K		.625	.250	18	15.9	6.4	1.0
LR-B10	RWR-84	7.0	10.0	95K		.875	.312	18	22.2	7.9	1.0
LR-B12		10.0	12.0	150K		1.200	.312	18	31.0	7.9	1.0
LR-B15		15.0	18.0	260K		1.780	.375	18	45.2	9.5	1.0

\* Lead Diameter AWG/(DEC.): 18/(.040"); 20/(.032"); 22/(.025"); 24/(.020").



## SPECIFICATIONS—POWER WIREWOUND RESISTORS

### POWER, PRECISION SILICONE COATED, WIREWOUND RESISTORS

**Power Ratings:**

.4 through 15 watts depending on style; 275°C maximum hot spot at 25°C at ambient. Conforms to characteristic “U” of MIL-R-26.

1.0 through 18 watts depending upon style; 350°C maximum hot spot at 25°C at ambient. Conforms to characteristic “V” of MIL-R-26.

**Temperature Range:**

Characteristic “U”: -55°C to +275°C

Characteristic “V”: -55°C to +350°C

**Resistance Values:**

From .01Ω through 260K

**Standard Temperature Coefficients:**

<1 ohm = Slightly higher TC's

≥1 ohm ≤ 10 ohms ± 50 ppm/°C

≥10 ohms ± 20 ppm/°C

**Construction:**

Controlled tensionless windings on centerless ground Steatite, Alumina, Beryllium Oxide cores. All-welded terminations with high-temperature silicone coating over whole assembly.

**Leads:**

Copper weld, tinned, 1.5” minimum length. Other leads available on request. Leads are solderable and weldable. Radial leads are available upon request. Consult factory for dimensions.

**Standard Tolerance:**

5% Tolerances to ± .01% available.

**Standard Marking:**

Lartronic Style No.

Resistance Value and Tolerance

Special Markings available

**Standard Encapsulation:**

Special high-temperature silicone conformal coating or injection molded. Our special coatings will withstand chlorethanes and other degreasing chemicals.

**Ordering Information:**

Type: LRP-3

Resistance: 500Ω

Tolerance: 1%

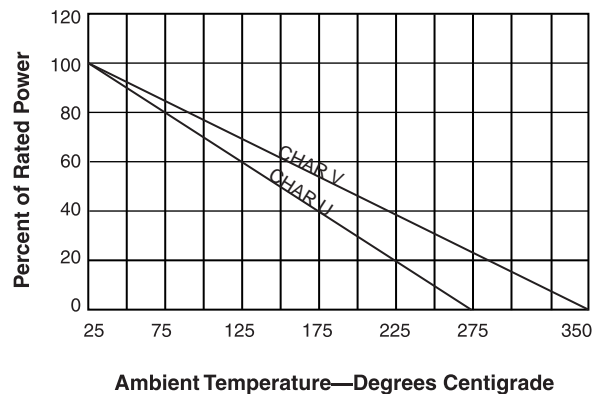
**Power Ratings:**

Lartronic “LRP” Series has two power ratings, depending on operating temperature and stability requirements.

Characteristic “U” + 275°C maximum hot spot temperature

Characteristic “V” + 350°C maximum hot spot temperature

OPERATING: Lartronic “LRP” resistors have an operating temperature range of -55°C to +275°C (characteristic “U”) or to +350°C (characteristic “V”)



**NOTE:** For Noninductive windings, insert letter "N"  
 Example: LRP-10N  
 1. Divide max. res. by two  
 2. Multiply max. working voltage by .707  
 3. For radial leads insert the letter "R"

## TYPE LH CHASSIS MOUNT ALUMINUM-FINNED HEAT SINK

### PRECISION POWER RESISTORS—5 THROUGH 250 WATTS

Chassis Mount, Type LH units are designed for maximum heat dissipation by mounting solidly to metal chassis surface for maximum heat transfer. They are outstanding for their high power dissipation with precision tolerances in minimum physical sizes.

#### Electrical Specifications

1. Resistance Range: .05 ohms to 275K ohms.
2. Tolerance: 5%, 3%, 1%, .5%, .25%, .1%, .05%.
3. Temperature Coefficient:  $\pm 20$  ppm to 90 ppm.

#### General Specifications

1. Lower hot spot ratings due to exclusive complete encapsulation of element within anodized aluminum body.
2. Welded construction throughout assures long stable load life.
3. Heavy spade lug type leads on 5 through 70 watt sizes, threaded heavy stud terminals on 100 through 250 watts.
4. 1000 VAC minimum dielectric strength on LH5 and LH10; 2500 VAC on LH25, LH50 and LH100; 5500 VAC on all others.
5. Temperature Range:  $-55^{\circ}\text{C}$  to  $+275^{\circ}\text{C}$ .
6. Eight standard sizes.

#### Derating Curves

Temperature of  $-55^{\circ}\text{C}$  to  $+275^{\circ}\text{C}$ . Derating is required for reduced chassis mounting area and high ambient temperature.

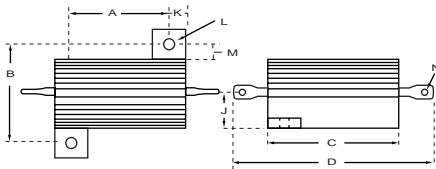
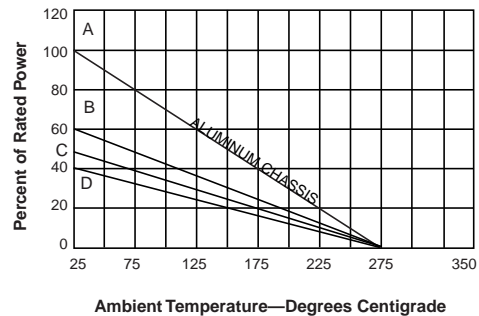
Curves: A—When mounted on proper aluminum chassis:

- $4 \times 6 \times 2 \times .040$  aluminum chassis = LH5 & LH10
- $5 \times 7 \times 2 \times .040$  aluminum chassis = LH25
- $12 \times 12 \times .059$  aluminum panel = LH50 & LH100
- $12 \times 12 \times .125$  aluminum panel = LH110, LH180 and LH250

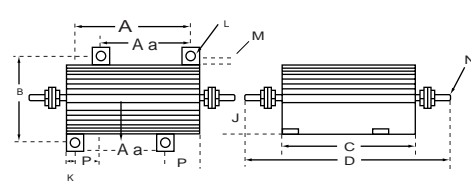
B—Unmounted LH5, LH10

C—Unmounted LH25, LH100 and LH110

D—Unmounted LH50, LH180 and LH250



LH5, LH10, LH25, LH50, LH100



LH110, LH180, LH250

### DIMENSIONS TABLE

LH Type	Mil-R 18546	Com. Watts	Max. Res.	A	Aa	B	C	D	E	F	G	H	J	K	L	M	N	P	No. Mtg. Screw Size
LH5	RE60	5	20K	.444	—	.490	.600	1.125	.334	.646	.317	.075	.145	.078	.093	.078	.050		2-#2
LH10	RE65	10	30K	.562	—	.625	.750	1.375	.438	.812	.406	.100	.203	.093	.093	.094	.086		2-#2
LH25	RE70	25	75K	.719	—	.781	1.062	1.938	.500	1.094	.563	.094	.250	.171	.125	.125	.086		2-#2
LH50	RE75	50	200K	1.563	—	.844	1.968	2.781	.625	1.156	.625	.094	.281	.196	.125	.125	.086		2-#4
LH100	—	70	275K	2.625	—	.844	2.968	3.781	.625	1.156	.625	.094	.281	.196	.125	.125	.086		2-#4
TOL.	—	—	—	$\pm .005$	—	$\pm .005$	$\pm .031$	$\pm .063$	$\pm .031$	$\pm .031$	$\pm .031$	$\pm .016$	$\pm .016$	$\pm .01$	$\pm .005$	$\pm .016$	$\pm .005$	—	—
LH110	RE77	100	50K	2.750	—	2.250	3.500	5.478	1.800	2.813	1.750	.188	.800	.375	.188	.250	$\frac{12}{24}$ <sup>thd</sup>		2-#8
LH180	—	180	50K	2.770	—	2.500	3.500	5.478	2.125	3.000	2.188	.250	.950	.375	.188	.200	$\frac{12}{24}$ <sup>thd</sup>		2-#8
LH250	RE80	250	45K	3.875	3.00	2.500	4.500	7.000	2.125	3.000	2.188	.250	1.000	.312	.188	.200	$\frac{1}{4}$ <sup>thd</sup> / $\frac{20}$	.875	4-#8
TOL.	—	—	—	$\pm .010$	$\pm .010$	$\pm .010$	$\pm .094$	$\pm .094$	REF.	$\pm .031$	$\pm .031$	$\pm .016$	REF.	$\pm .031$	$\pm .010$	REF.	—	$\pm .010$	—

\*\* For Non-Inductive Winding add Suffix "N" to Callout.



## CROSS REFERENCE PRECISION WIREWOUND RESISTORS\*

Lartronic Type		Dale		IRC			OHMITE		
LS.5		WSC-½							
LS1		WSC-1		MSM-1			W1R5/W1S5		
LS2		WSC-2		MSM-2			W2R5		
Lartronic Type	MIL-R-93/ MIL-R-39005	Dale	RCL	Kelvin	Imperial	Ultronix	RCD	Riedon	PRC
LR0			7001		MO-2	123A		SM2	
LR00			7005	301-P	MO-3	122A	MA202	SM3	118AP
LR02		WWA-13		EP-01	MO-4			SM4	122AP
LR04					MO-5			SM5	
LR06					MO-6			SM6	130AP
LR08					MO-7			SM7	
LR07					MO-12	185A	MA207	SM12	
LR03					MO-13	103A		SM13	
LR01			7007	EP-20	MO-15	184A	MA206	SM15	134AP
LR09	RB-56/RBR-56	WWA-23	7009	417-P	A00	202A	SA100	100	152AP
LR10	RB-55/RBR-55	WWA-24	7010	467-P	A01	205A	SA101	101	156AP
LR15	RB-54/RBR-54	WWA-26	7020	812-P	A02	207A	SA102	102	164AP
LR18				EP-24	A03	308A		103	
LR19		WWA-44	7044	EP-25	A04	505A	SA108	104	176AP
LR21		WWA-45	7045	EP-26	A05			105	180AP
LR30	RB-57/RBR-57	WWA-48	7050	EP-27	A06	510A	SA109	106	188AP
LR35	RB-58/RBR-58	WWA-412	7060	EP-28	A07	515A	SA110	107	192AP
LR40	RB-59/RBR-59	WWA-416	7070	EP-29	A08	520A	SA111	108	
LR16				334-P	A20	305A		120	172AP
LR17	RB-53/RBR-53	WWA-36	7030	815-P	A21	307A	SA104	121	168AP
LR20	RB-52/RBR-52	WWA-38	7040	254-P	A29	310A	SA105	129	184AP
LPC09			4061	178-P	A00PC		PC402	131PC	512PC
LPC10				471-P	A01PC	204PA		101PC	
LPC19					A04PC	505PA		104PC	
LPC16	RB-70		4065	179-P	A20PC	305PA	PC406	120PC	
LPC1				176-P	A30PC	203PC		130PC	
LPC2	RB-71/RBR-71	WWP-225	4060	991-P	A31PC	203PA	PC401	131PC	500PC

\* This cross reference between Lartronic resistors and those of other manufacturers may have some minor differences. See catalog or consult the factory for more detailed information. The MIL type designation is shown as a reference only and does not imply qualification or approval to QPL.



## CROSS REFERENCE POWER WIREWOUND RESISTORS\*

Lartronics Type	MIL-R-26/ MIL-R-39007	Cal-R	Dale	RCD	Kelvin	OMI	Riedon	PRC	RCL	IRC/ TRW	Ultronics
LRP½A		SA-01	RS-¼	110	KM-025	T-½A	UT-½A		T-½A		CS-05
LRP½		SA-05	RS-½	115	KM-050	T-½	UT-½	05A	T-½	AS-½	CS-1
LRP1	RW-70	SA-15	RS-1A	125	KM-100	T-1A	UT-1A	15A	T-1A	AS-1	CS-2
LRP2				133		T-2	UT-2		T-2		CS-35
LRP2A	RW-69	SA-30	RS-2C	135	KM-250	T-2A	UT-2A	N-1A	T-2A	AS-2	CS-3
LRP3	RW-79/RWR-89	SA-31	RS-2B	140	KM-300	T-2B	UT-2B	1-A	T-2B	AS-2B	CS-4
LRP3C				150		T-2C	UT-2C	2-A			CS-43
LRP4		SA-35	RS-2	155	KM-350	T-3	UT-3	3-A	T-3	AS-3	CS-46
LRP5A							UT-5A				
LRP5	RW-74/RWR-74	SA-50	RS-5-69	160	KM-500	T-5	UT-5	5-A	T-5-74	AS-5	CS-6
LRP7	RW-67	SA-55	RS-5	165		T-6	UT-6	7-A	T-6-67		CS-7
LRP7A		SA-95			KM-700	T-7A	UT-7A		T-7A	AS-7	CS-8
LRP10	RW-78/RWR-78	SA-100	RS-10	175	KM-1000	T-10-20	UT-10	10-A	T-10	AS-10	CS-10
LRB1	RW-80/RWR-81	SA-02	G-1	110Be0	KMB-100	F-1	UB-1	B-1	B-1		CS-05B
LRB2	RWR-82		G-2			F-2	UB-2	B-2	B-2		CS-1B
LRB3	RW-80/RWR-80	SA-15	G-3	125Be0	KMB-225	F-3	UB-3	B-3	B-3		CS-2B
LRB5			G-5		KMB-400	F-5	UB-5	B-5	B-5		CS-4B
LRB5C			G-5C			F-5C	UB-5C	B-5C	B-5C		CS-43B
LRB6			G-6			F-6	UB-6	B-6	B-6		CS-46B
LRB10	RWR-84	SA-50	G-10		KSB-700	F-10	UB-10	B-10	B-10		
LRB12			G-12			F-12	UB-12	B-12	B-12		
LRB15			G-15		KSB-1500	F-15	UB-15	B-15	B-15		
	<b>MIL-R-18546D/ MIL-R-39009</b>										
LH5	RE-60/RER-60	MC-80	RH-5	605	KC-500	HF-5	UALB-5	5-CH	AL-5		
LH10	RE-65/RER-65	MC-100	RH-10	610	KC-1000	HF-10	UALB-10	10-CH	AL-10		
LH25	RE-70/RER-70	MC-250	RH-25	620	KC-2500	HF-25	UALB-25	25-CH	AL-25		
LH50	RE-75/RER-75	MC-500	RH-50	630	KC-5000	HF-50	UALB-50	50-CH	AL-50		
B5LH			HG-5			HT-5		B5-CH	ALB-5		
B10LH			HG-10			HT-10		B10-CH	ALB-10		
B25LH			HG-25			HT-25		B25-CH	ALB-25		
B50LH			HG-50			HT-50		B50-CH	ALB-50		

\* This cross reference between Lartronics resistors and that of other manufacturers may have some minor differences. Consult factory for Ohmite cross references. See catalog or consult the factory for more detailed information. The MIL type designation is shown as a reference only and does not imply qualification or approval to QPL.

## LTO STYLE THICK FILM HEAT SINK DEVICE

### FEATURES

LTO style package  
Miniature size  
Maximum power: size ratio  
High stability  
Optimum heat dissipation  
High temperature molding  
Noninductive

### VARIATIONS

Tolerance to 0.05%  
Special TC  
Lead length

### MECHANICAL

**Terminal Strength:**

5 lb. pull test

**Solderability:**

Meets requirements of MIL-STD-202

**Solvent Resistance:**

Meets requirements of MIL-STD-202

### MATERIAL

**Heat Sink:**

Plated copper

**Element:**

High stability thick film

**Leads:**

Tinned copper

**Molding:**

High temperature thermoset



### TYPE LTO 20

**Temperature Coefficient:**

Less than 10 ohms, 100 ppm  
Above 10 ohms, 50 ppm

## TELECOMMUNICATIONS LINE FEED PROTECTOR

### FEATURES

Continuous full power operation (2 watts)  
Radial lead  
High stability  
Flameproof construction  
Withstands lightning surges  
Fuses open safely under overpower conditions



### GENERAL SPECIFICATIONS

**Standard Tolerances:**

0.05% to 5%

**Dielectric Strength:**

1000 VAC

**Insulation Resistance:**

1000 megohms minimum

**Temperature Coefficients:**

10 ohms and above:  $\pm 20$  ppm

1 ohm to 9.9 ohms:  $\pm 50$  ppm

**Short Time Overload:**

$(5x \text{ rated power for 10 sec}) \leq 2\% \Delta R$

**Terminal Strength:**

10 lb. pull test

**Load Life:**

$(1000 \text{ hrs.}) \leq 2\% \Delta R$

**Temperature Cycling:**

$\leq 5\% \Delta R$

### VARIATIONS

Tolerances to .05%  
Matching and binning available  
Special temperature or fusing  
Characteristics available

### CONSTRUCTION

The Line Feed Protector consists of a wirewound resistor and a temperature activated thermal cutoff.

### DIMENSIONS—INCHES

In usage, leads 1 and 2 should be connected to each other externally. Use leads 3 and 4 in actual circuitry. Current flow should be from lead 3 to lead 4.

## TELECOMMUNICATIONS LINE FEED PROTECTOR

### FEATURES

Continuous full power operation (2 watts)  
Radial lead  
High stability  
Flameproof construction  
Withstands lightning surges  
Fuses open safely under overpower conditions  
Space-saving vertical mount



### GENERAL SPECIFICATIONS

**Standard Tolerances:**

0.05% to 5%

**Dielectric Strength:**

1000 VAC

**Insulation Resistance:**

1000 megohms minimum

**Temperature Coefficients:**

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**Terminal Strength:**

10 lb. pull test

**Load Life:**

(1000 hrs.)  $\leq 2\% \Delta R$

**Temperature Cycling:**

$\leq 5\% \Delta R$

### VARIATIONS

Tolerances to .05%

Matching and binning available

Special temperature or fusing

Characteristics available

### CONSTRUCTION

The Line Feed Protector consists of a wirewound resistor and a temperature activated thermal cutoff.

### DIMENSIONS—INCHES





WIREWOUND RESISTORS  
POWER RESISTORS  
PRECISION RESISTORS

548 Division Street

Campbell, CA 95008

(408) 379-6454

FAX (408) 379-6576

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In addition to our custom wirewounds, Lartronic's, Inc. also offers a variety of resistors such as metal film, carbon film, carbon composition, metal oxide, chip resistors, and resistor networks available through our distributor program.

**STOCKED LOCALLY**