

SECTION 4700 eem File System **ELECTRA 1969**

Datasheet Provided by 33Audio.com

See 1970 Electra Specs for wattage change

EKC logo uses T-0 for 100ppM/degC

E logo uses D for 100ppM/degC

METAL FILM PRECISION RESISTORS

CHARACTERISTIC CODE: Characteristic D (0 ±100 PPM/°C)
 Characteristic C & F (0 ±50 PPM/°C)
 Characteristic E (0 ±25 PPM/°C)
 MIL-R-22684 (0 ±150 PPM/°C)

ELECTRA/MIDLAND TYPES & DIMENSIONS			POWER RATING (WATTS) @		CHARACTERISTIC & T.C. of R (PPM/°C)	RESISTANCE RANGE (See Notes)	TOLERANCE(5)	MIL EQUIV
MOLDED		CONFORMALLY COATED	125°C	70°C				
MIL LINE		TRIM LINE						
	MF3C A = .130/.170 B = .050/.080 AWG = #26		1/20		D = ±100 C = ±50 E = ±25	10 ohm-100K 30.1 ohm-100K 30.1 ohm-100K	F F F	RN50
MF4 A = .250/.270 B = .115/.135 AWG = #22	MF4C A = .219/.281 B = .083/.103 AWG = #22		1/10	1/8	D = ±100 C = ±50 E = ±25	10 ohm-301K 30.1 ohm-301K 30.1 ohm-200K	F,D B,C,D,F B,C,D,F	RN55
MF5 A = .385/.415 B = .125/.145 AWG = #22	MF52C A = .375/.430 B = .130/.160 AWG = #22	MF5C A = .281/.343 B = .083/.103 AWG = #22	1/8	1/4	D = ±100 C = ±50 E = ±25	10 ohm-1 Meg.(1) 30.1 ohm-499K 30.1 ohm-499K	F,D B,C,D,F B,C,D,F	RN60
MF6 A = .580/.610 B = .205/.225 AWG = #22	MF62C A = .600/.656 B = .157/.177 AWG = #22	MF6C A = .375/.560 B = .130/.160 AWG = #22	1/4	1/2	D = ±100 C = ±50 E = ±25 F = ±50	10 ohm-2 Meg.(2) 49.9 ohm-1 Meg. 49.9 ohm-1 Meg. 49.9 ohm-1 Meg.	F,D B,C,D,F B,C,D,F B,C,D,F	RN65
MF7 A = .745/.765 B = .245/.275 AWG = #20	MF72C A = .688/.765 B = .220/.320 AWG = #20	MF7C A = .600/.656 B = .150/.180 AWG = #20	1/2	3/4	D = ±100 C = ±50 E = ±25 F = ±50	10 ohm-2.49 Meg.(3) 49.9 ohm-1 Meg. 49.9 ohm-1 Meg. 49.9 ohm-1 Meg.	F,D B,C,D,F B,C,D,F B,C,D,F	RN70
MF8 A = 1.100/1.120 B = .390/.410 AWG = #20		MF8C A = .960/1.020 B = .280/.320 AWG = #20	1	blank	D = 100 C = 50 E = 25	10 ohm-5.11 Meg.(4) 49.9 ohm-2 Meg. 49.9 ohm-2 Meg.	F,D B,C,D,F B,C,D,F	RN75
MF9 A = 2.215/2.265 B = .375/.415 AWG = #20		MF9C A = 2.025/2.165 B = .280/.320 AWG = #20	2	blank	D = 100 C = 50 E = 25	100 ohm-10 Meg. 100 ohm-10 Meg. 249 ohm-5.11 Meg.	F,D B,C,D,F B,C,D,F	RN80
	MF07C A = .219/.281 B = .082/.098 AWG = #22		1/8	1/4	±150	51 ohm-150K 10 ohm-301K (extended range-commercial only)	G,J	RL07
	MF20C A = .384/.416 B = .130/.160 AWG = #20		1/4	1/2	±150	51 ohm-470K 15 ohm-499K (extended range-commercial only)	G,J	RL20

TO ORDER, SPECIFY (TYP.): MF52C - E - 1001 - F
 (Add lead options, packing data if needed.)

NOTES: Carbon Film will be supplied in the following values with T.C. of R to -500 PPM/°C:

- (1) 10 Ω to 14.9 Ω and 500K to 1 Meg.
- (2) 10 Ω to 14.9 Ω and 1.02 Meg. to 2.0 Meg.
- (3) 10 Ω to 14.9 Ω and 1.51 Meg. to 2.49 Meg.
- (4) 10 Ω to 48.7 Ω and 2.01 Meg. to 5.11 Meg.
- (5) Tolerance Code: B = 0.10%, C = 0.25%, D = 0.50%, F = 1.0%, G=2%, J=5%
- (6) MF35 Maximum Value 100K

E ELECTRA/MIDLAND CORPORATION
 ELECTRA DIV.
 Box 760, Mineral Wells, Texas 76067

A SUBSIDIARY OF TRANSITRON Electronic Corporation

Electra 1970 from EEM70

Compare with 1969 page for wattage change

Datasheet Provided by 33Audio.com

METAL FILM PRECISION RESISTORS



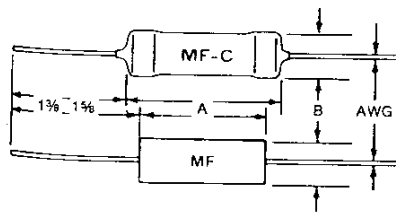
CHARACTERISTIC CODE: Characteristic D (0 ± 100 PPM/ $^{\circ}$ C)
 Use watt ratings from 1969. Characteristic C & F (0 ± 50 PPM/ $^{\circ}$ C)
 The increased 70deg ratings are evidently a mistake. 1985 Characteristic E (0 ± 25 PPM/ $^{\circ}$ C)
 datasheet ratings are the same as 1969. MIL-R-22684 ($0 \pm 100^{\circ}$ PPM/ $^{\circ}$ C)

ELECTRA/MIDLAND TYPES & DIMENSIONS			POWER RATING (WATTS) @		CHARACTERISTIC & T.C. of R (PPM/ $^{\circ}$ C)	RESISTANCE RANGE (See Notes)	TOLERANCE(3)	MIL EQUIV.
MOLDED	CONFORMALLY COATED		125 $^{\circ}$ C	70 $^{\circ}$ C				
	MIL LINE	TRIM LINE						
		MF3C A = .130/.170 B = .050/.080 AWG = #26	1/20	1/10	D = ± 100 C = ± 50 E = ± 25	10 ohm-100K 30.1 ohm-100K 30.1 ohm-100K	F,D F,D F,D	RN50
MF4 A = .250/.270 B = .115/.135 AWG = #22		MF4C A = .219/.281 B = .083/.110 AWG = #22	1/10	1/4	D = ± 100 C = ± 50 E = ± 25	10 ohm-499K 30.1 ohm-499K 30.1 ohm-499K	F,D B,C,D,F B,C,D,F	RN55
MF5 A = .385/.415 B = .125/.145 AWG = #22	MF52C A = .375/.430 B = .130/.160 AWG = #22	MF5C A = .281/.343 B = .083/.110 AWG = #22	1/8	1/2	D = ± 100 C = ± 50 E = ± 25	10 ohm-1 Meg.(1) 30.1 ohm-1 Meg. 30.1 ohm-1 Meg.	F,D B,C,D,F B,C,D,F	RN60
MF6 A = .580/.610 B = .210/.230 AWG = #22	MF62C A = .600/.656 B = .157/.177 AWG = #22	MF6C A = .500/.560 B = .130/.160 AWG = #22	1/4	1	D = ± 100 C = ± 50 E = ± 25 F = ± 50	10 ohm-2 Meg.(1) 49.9 ohm-2 Meg. 49.9 ohm-2 Meg. 49.9 ohm-2 Meg.	F,D B,C,D,F B,C,D,F B,C,D,F	RN65
MF7 A = .745/.765 B = .245/.275 AWG = #20	MF72C A = .688/.765 B = .220/.260 AWG = #20	MF7C A = .600/.656 B = .150/.180 AWG = #20	1/2	1	D = ± 100 C = ± 50 E = ± 25 F = ± 50	10 ohm-2.49 Meg.(1) 49.9 ohm-2.49 Meg. 49.9 ohm-2.49 Meg. 49.9 ohm-2.49 Meg.	F,D B,C,D,F B,C,D,F B,C,D,F	RN70
MF8 A = 1.100/1.120 B = .390/.410 AWG = #20		MF8C A = .960/1.020 B = .280/.320 AWG = #20	1	2	D = ± 100 C = ± 50 E = ± 25	10 ohm-5.11 Meg.(2) 49.9 ohm-3 Meg. 49.9 ohm-3 Meg.	F,D B,C,D,F B,C,D,F	RN75
MF9 A = 2.215/2.265 B = .375/.415 AWG = #20		MF9C A = 2.025/2.165 B = .280/.320 AWG = #20	2	3	D = ± 100 C = ± 50 E = ± 25	100 ohm-10 Meg. 100 ohm-10 Meg. 249 ohm-5.11 Meg.	F,D B,C,D,F B,C,D,F	RN80
	MF07C A = .219/.281 B = .082/.098 AWG = #22		1/8	1/4	± 100	51 ohm-150K 10 ohm-301K (extended range-commercial only)	G,J	RL07
	MF20C A = .384/.416 B = .130/.160 AWG = #20		1/4	1/2	± 100	51 ohm-470K 15 ohm-499K (extended range-commercial only)	G,J	RL20

TO ORDER, SPECIFY (TYPE) - MF52C - E - 1001 - F
 (Add lead options, packing data if needed.)

NOTES: Carbon Film may be supplied in the following values with T.C. of R = -200 to -500 PPM/ $^{\circ}$ C:

- (1) 10 Ω to 14.9 Ω
- (2) 10 Ω to 14.9 Ω and 3.01 to 5.11 Meg.
- (3) Tolerance Code: B = 0.10%. C = 0.25%. D = 0.50%. F = 1.0%. G = 2.0%. J = 5.0%



ELECTRA/MIDLAND CORPORATION

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A TRANSISTRON COMPANY

1970

See YELLOW SECTION for Local Offices, Phones

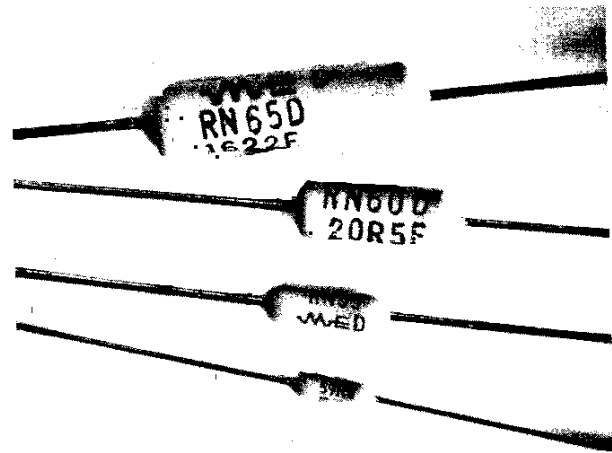
1985-1986 Mepco/Electra

MIL STYLE RN

Standard Military Resistors

Conformal-Coated (MIL-R-10509 Qualified)

±0.1%, 0.25%, 0.5%, and 1% Tolerance
 Characteristics C (±50PPM), D (±100PPM),
 and E (±25PPM)



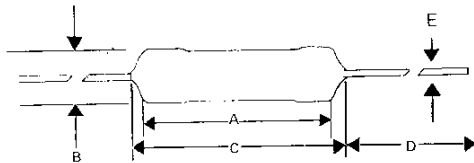
DESCRIPTION

This Series encompasses an unusually broad selection of tolerances, temperature characteristics, and power ratings, in all their combinations, with full MIL-R-10509 performance. In almost every instance, the MIL requirements are exceeded to a substantial degree. These resistors feature the low noise, high stability, and wide operating frequency range characterizing the Mepco/Electra metal-film design, in minimum size for their power ratings.

DESIGN FEATURES

- **Excellent Initial Accuracy and Long-Term Stabilities**, approaching wirewound resistor performance.
- **Lowest Voltage and Power Coefficients** ever attained in a metal-film resistor.
- **Low Temperature Coefficients**. Characteristic E equals the performance of conventional wirewound designs.
- **Excellent Matching and Tracking**. Tolerances of 0.1%, 0.25%, 0.5% and 1% are standard. Ratio sets track closely over wide temperature ranges, long term.
- **Very Low Reactance**—low series L, low shunt C; reactance error is generally less than tolerance up to 10MHz, for most resistance values.

DIMENSIONS



Fixed Resistors

SPECIFICATIONS & NOMENCLATURE

MIL Type	Mepco-Electra P/N	Power Rating* (Watts)		Temperature Coefficient of Resistance (PPM/C°)	Qualified Resistance Range (ohms)	Mepco/Electra Resistance Range (ohms)†	Resistance Tolerance (±%)	Max Voltage	Dimensions—See Diagram Inches (mm)				
		MIL-R-10509	70°C						A	B	C**	D	E
RN50	5023R	1/10	D = ±100	***	10 Ω - 499K	D = .5, F = 1	200	.150 ± .020 (3.81 ± 0.51)	.070 ± .010 (1.79 ± 0.23)	200 (5.08)	1.5 (38.1)	.016" (.41) (#26)	
													1/20
			E = ±25	30.1 Ω - 100K	30.1 Ω - 200K								
RN55	5033R	1/8	D = ±100	10 Ω - 301K	1 Ω - 2M	D = .5, F = 1	250	.261 ± .020 (6.63 ± 0.51)	.093 ± .005 (2.36 ± 0.13)	.300 (7.62)	1.5 (38.1)	.025" (.63) (#22)	
		1/10	C = ±50 E = ±25	49.9 Ω - 100K	49.9 Ω - 2M 49.9 Ω - 1M	B = .1, D = .5 C = .25, F = 1	200						
RN60	5043R	1/4	D = ±100	10 Ω - 1M	10 Ω - 2M	D = .5, F = 1	300	.390 ± .020 (9.91 ± 0.51)	.152 ± .009 (3.86 ± 0.23)	.430 (10.92)	1.5 (38.1)	.025" (.63) (#22)	
		1/8	C = ±50 E = ±25	49.9 Ω - 499K	30.1 Ω - 2M 30.1 Ω - 1M	B = .1 C = .25 D = .5 F = 1	250						
RN65	5053R	1/2	D = ±100	10 Ω - 2M	10 Ω - 4M	D = .5, F = 1	350	.620 ± .020 (15.75 ± 0.51)	.167 ± .010 (4.24 ± 0.26)	.650 (16.51)	1.5 (38.1)	.025" (.63) (#22)	
													1/4
			E = ±25	49.9 Ω - 1M	49.9 Ω - 2M	D = .5, F = 1							

* Because of efficient design, the Mepco/Electra RN series will safely support a 70°C power rating of 2x the Mil-R-10509 rating.

** Clean lead to clean lead. *** Mil-R-10509 does not include a D characteristic RN50.

† Within the resistance ranges shown, resistance values indicated in the MIL 10 to 100 decade table of values (see table page 524), and their decade multiples, are available as standard. Other values are available on special order.

Mepco/Electra 1985-1986

Datasheet from 33Audio.com

Standard Military Resistors Conformal-Coated (MIL-R-10509) **MIL STYLE RN**

PERFORMANCE CHARACTERISTICS

As a guide to the performance that can be expected of RN Series resistors, the following chart indicates typical results of tests performed in accordance with MIL-R-10509.

Test	Max. % Change in Resistance	
	MIL-R-10509 (Characteristics C & E) Requirements	MEPCO/ ELECTRA RN - Series Average
Temperature Cycling, -65 to +150°C	.25%	.05%
Low temperature operation, -65*	.25%	.02%
Short time overload	.25%	.02%
Terminal strength, 5 lb load	.2%	.02%
Dielectric withstanding Voltage	.25%	.01%
Resistance to soldering heat, 350°C	.10%	.01%
Moisture resistance	.50%	.05%
Life (1,000 hours)	.50%	.10%
Shock, medium impact, 50G, 11ms.	.25%	.01%
Vibration, High frequency 10-2000Hz	.25%	.01%

MARKING

Standard military RN Series resistors are marked with the MIL style, characteristic, resistance, and tolerance, as specified in MIL-R-10509. (See JAN Marking)

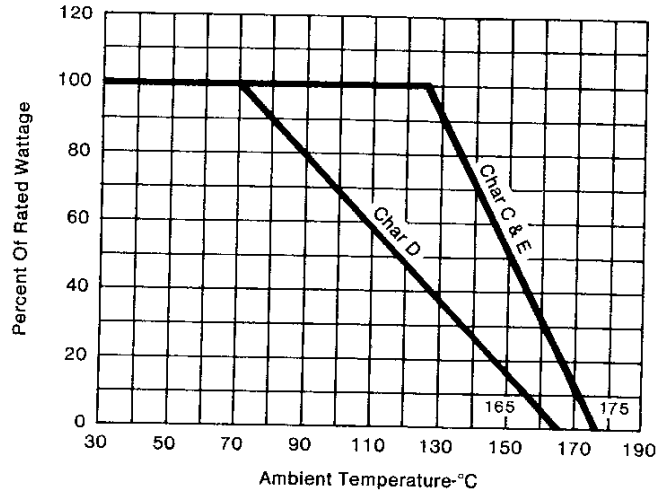
LEAD MATERIAL

Type C, Mil-Std-1276

See table below for typical capacitance values.

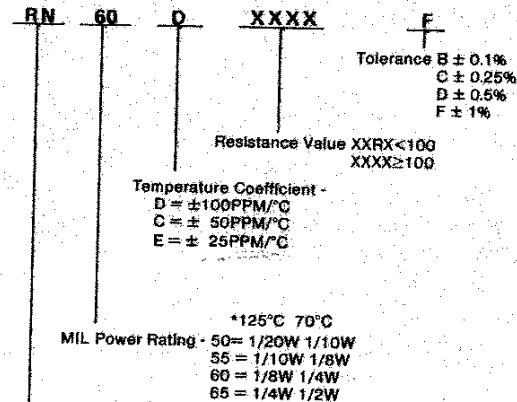
M/E Style	5023R	5033R	5043R	5053R
C (pF) ±25%	0.18	0.18	0.21	0.33
Voltage Coefficient PPM/Volt) ±25%	6	5	3	2
Power Coefficient °C/Watt) ±10%	220	130	93	75

DERATING CURVE



HOW TO SPECIFY

MIL STYLE RN Resistors can be completely specified using the following designation.



MIL Designation MIL-R-10509 Resistor
*Power Rating Dependent T.C. - See Specifications And Nomenclature

MIL-R-10509

"J" OR "JAN" MARKING

The Defense Electronics Supply Center (D.E.S.C.) has stated that all Mil-R-10509 qualified products, manufactured after January 4, 1982 must be marked with the "J" or "JAN" marking, to prevent the sale of non-qualified product as qualified product. In order to permit usage of stock manufactured prior to January 4, 1982, parts manufactured (without the JAN marking) may be supplied until October 7, 1983.

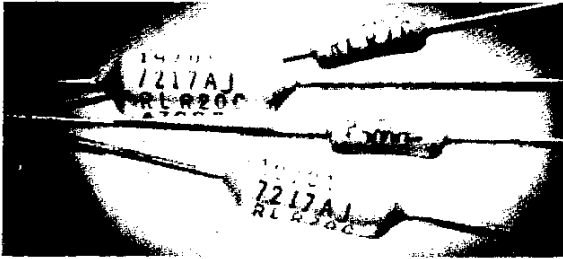
Mil-R-10509 has limited resistance ranges (compared to Mil-R-55182). Mepco/Electra's policy is to supply products qualified to Mil-R-10509 with the JAN marking. Resistance values above or below those specified in Mil-R-10509, where Mepco/Electra testing demonstrates the capability of meeting the performance requirement of Mil-R-10509, will be marked in accordance with Mil-R-10509 but without the JAN marking.

Mepco/Electra 1985-1986

Datasheet from 33Audio.com

Film Resistors

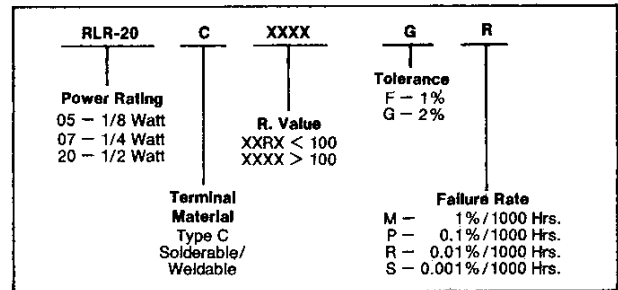
Military Style RLR (Conformal Coat)



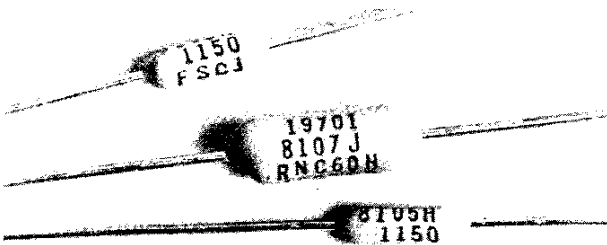
- Lowest Voltage and Power Coefficients
- Low Noise
- Wide Resistance Range
- Excellent Immunity to Environmental Stress
- Very Low Reactance

MIL Type	Mepco/Electra P/N	MIL Power Rating (70°C)	Temperature Coeff. of Resistance (PPM/°C)	Resistance Range* (ohms)	Resistance Tolerance (±%)
RLR05	5033U	1/8W	±100	10Ω-301K	G = 2% F = 1%
RLR07	5043U	1/4W	±100	10Ω-1.33Meg	G = 2% F = 1%
RLR20	5053U	1/2W	±100	4.3Ω-1 Meg	G = 2% F = 1%

HOW TO SPECIFY



Military Style RNC/RNR (Non-Hermetic)



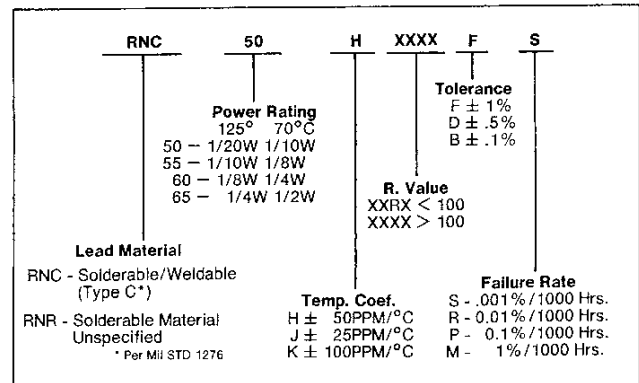
- Excellent Initial Accuracy and Long-Term Stabilities, approaching wirewound resistor performance.
- Lowest Voltage and Power Coefficients ever attained in a metal-film resistor.
- Low Temperature Coefficients. Characteristic J equals the performance of conventional wirewound designs.
- Low Noise. Johnson noise is lowest attainable, except in best wirewound designs.
- Excellent Immunity to Environmental Stress. Highest reliability in this class.

SPECIFICATIONS & NOMENCLATURE

MIL Type	Mepco/Electra P/N	MIL Power Rating (Watts) 125°C 70°C	Temperature Coeff. of Resistance (PPM/°C)	Resistance Range* (ohms)	Resistance Tolerance (±%)
RNC50	5013V	1/20 1/10	J = ±25 H = ±50 K = ±100	24.9 Ω - 301KΩ	B = 0.1 D = 0.5 F = 1.0
RNC55	5023V	1/10 1/8	J = ±25 H = ±50 K = ±100	10Ω - 301KΩ 10Ω - 301KΩ	B = 0.1 D = 0.5 F = 1.0
RNC60	5033V	1/8 1/4	J = ±25 H = ±50 K = ±100	24.9Ω - 3.01MΩ	B = 0.1 D = 0.5 F = 1.0
RNC65	5043V	1/4 1/2	J = ±25 H = ±50 K = ±100	30.1Ω - 3.01MΩ	B = 0.1 D = 0.5 F = 1.0

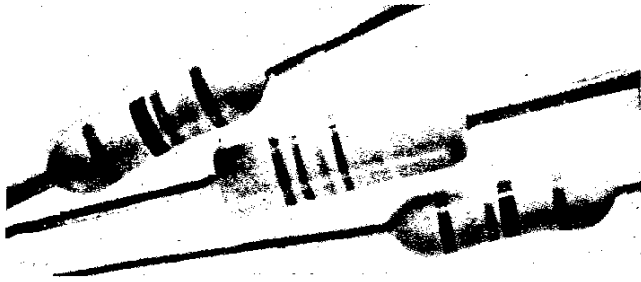
* Within the resistance ranges shown, resistance values indicated in the MIL 10 to 100 decade table of values and their decade multiples are available as standard. Other values are available on special order.

HOW TO SPECIFY — MIL PART PER MIL-R-55182



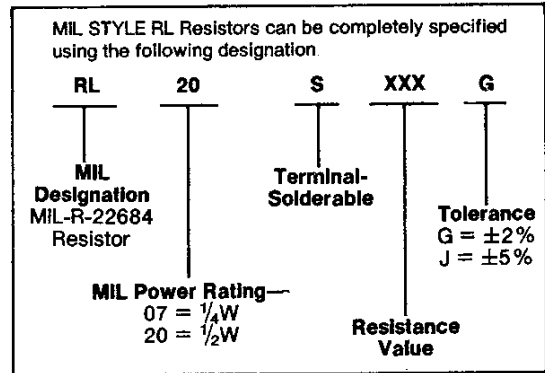
Film Resistors

Military Style RL



- Per MIL-R-22684
- Tolerance 2% and 5%
- Temp. Coef. 100 PPM
- 1/4 & 1/2 Watt (70°C)
- Conformal Coated

HOW TO SPECIFY



SPECIFICATIONS & NOMENCLATURE

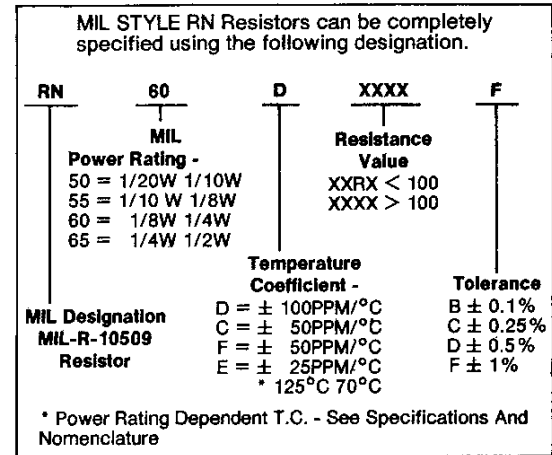
MIL Type	Mepco/Electra P/N	MIL Power Rating (70°C)	Temperature Coefficient of Resistance (PPM/°C)	Resistance Range (ohms)	Resistance Tolerance (±%)	Max. Voltage (Volts)
RL07	5043T	1/4W	± 100	51 Ω - 150K	G = ±2% J = ±5%	250V
RL20	5053T	1/2W	± 100	51 Ω - 470K	G = ±2% J = ±5%	350V

Military Style RN



- Per Mil-R-10509
- .1%, .25%, .5% & 1% Tolerance
- Temp. Coef. 25, 50 & 100 PPM
- 1/20, 1/10, 1/8, 1/4 & 1/2 Watt (125°C)
- 1/10, 1/8, 1/4, 1/2 Watt (70°C)
- Conformal Coated

HOW TO SPECIFY



SPECIFICATIONS & NOMENCLATURE

MIL Type	Mepco/Electra P/N	Power Rating (Watts)			Temperature Coefficient of Resistance (PPM/°C)	Resistance Range* (ohms)	Resistance Tolerance (±%)	Max. Voltage (Volts)
		MIL-R-10509 125°C	MIL-R-10509 70°C	Mepco/Electra 70°C				
RN50	5023R	1/10	1/8	D = ± 100	10Ω - 499K	D = 0.5 F = 1	200	
		1/20	1/8	C = ± 50 E = ± 25	30.1Ω - 499K 30.1Ω - 200K	B = 0.1 D = 0.5 C = 0.25 F = 1		
RN55	5033R	1/8	1/4	D = ± 100	10Ω - 2M	D = 0.5 F = 1	250	
		1/10	1/4	C = ± 50 E = ± 25	49.9Ω 750K	B = 0.1 D = 0.5 C = 0.25 F = 1	200	
RN60	5043R	1/4	1/2	D = ± 100	10Ω - 2Meg	D = 0.5 F = 1	300	
		1/8	1/2	C = ± 50 E = ± 25	30.1Ω - 2M 30.1Ω - 1M	B = 0.1 D = 0.5 C = 0.25 F = 1	250	
RN65	5053R	1/2	1	D = ± 100	10Ω - 4 Meg	D = 0.5 F = 1	350	
		1/4	1	C = ± 50 E = ± 25	49.9Ω - 4M	B = 0.1 D = 0.5 C = 0.25 F = 1	300	
		1/2	1	F = ± 50	49.9Ω - 2M			