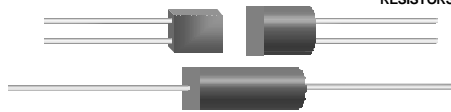


# ULTRA PRECISION WIREWOUND RESISTORS SA, MA, PC, & Q SERIES



## FEATURES

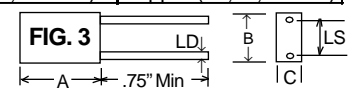
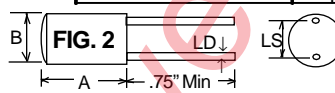
- Industry's widest range of precision wirewound resistors!
- 0.1Ω to 25M, 50mW to 2W, ±.005% to 1%, TC's to ±2PPM
- All welded construction, negligible noise, low thermal EMF
- Available on exclusive **SWIFT™** delivery program!

## OPTIONS

- Option 'X': Non-Inductive Winding (standard above 10KΩ)
- Option 'P': Increased Pulse Capability
- Option 'HS': High Speed/Fast Rise Time
- Opt. 'ER': Group A per MIL-PRF-39005 (MIL-R-10509 Q Series)
- Matched tolerances, T.C. tracking to 1ppm/°C
- Dozens of additional modifications are available... special marking, positive TC, hermetic seal, 4-terminal design, etc.

Series SA (standard axial), MA (mini), and PC (radial lead) are designed for critical-use functions, such as military & space applications. Series Q (economy) are designed for slightly less demanding applications. Series PC & Q are often utilized to replace metal film and foil resistors, and offer greater overload capability as well as lower costs. All models receive preconditioning thereby enabling exceptional stability and reliability.

Typ. Performance	SA/MA/PC Opt.ER	Q Series Opt.ER
Load Life	±.03%	±.05%
Short Time Overload	±.005%	±.02%
High Temp Exposure	±.05%	±.1%
Moisture	±.02%	±.03%
Operating Temp	-55 to +145°C	-55 to +160°C
Shelf Life Stability	±.002%/year	±.004%/year
Temp Coef ≥ 10Ω	20ppm (2,3,5,10 avail)	20ppm (2,3,5,10 avail)
1 - 9Ω	30ppm (5,10,20 avail)	30ppm (5,10,20 avail)
> 1Ω	90ppm (10,20,30 avail)	90ppm (10,20,30avail)



RCD TYPE	FIG.	MIL TYPE <sup>1</sup>	Wattage Rating		Maximum Voltage <sup>2,3</sup>	Res. Range 0.1Ω to	A ±.062 [ 1.6]	B ±.025 [.64]	LD Nominal	LS	C (Max)
			RCD <sup>2</sup>	MIL							
SA100	1	RB/RBR56	.25	.125	200	1.2 Meg	.350 [ 8.9]	.250 [6.35]	.032 [.81]	—	—
SA101	1	RB/RBR55	.33	.150	400	2.0 Meg	.500 [12.7]	.250 [6.35]	.032 [.81]	—	—
SA102	1	RB/RBR54	.50	.250	400	4.0 Meg	.750 [19.1]	.250 [6.35]	.032 [.81]	—	—
SA103	1	-	.75	-	800	5.0 Meg	1.00 [25.4]	.250 [6.35]	.032 [.81]	—	—
SA104	1	RB/RBR53	.60	.33	400	6.0 Meg	.750 [19.1]	.375 [9.52]	.032 [.81]	—	—
SA105	1	RB/RBR52	1.00	.50	800	10.0 Meg	1.00 [25.4]	.375 [9.52]	.032 [.81]	—	—
SA106	1	-	.60	-	400	6.0 Meg	.675 [17.1]	.437 [11.1]	.032 [.81]	—	—
SA107	1	-	1.25	-	800	12.0 Meg	1.00 [25.4]	.437 [11.1]	.032 [.81]	—	—
SA108	1	-	.60	-	400	7.0 Meg	.675 [17.1]	.500 [12.7]	.032 [.81]	—	—
SA109	1	RB/RBR57	1.25	.75	800	15.0 Meg	1.00 [25.4]	.500 [12.7]	.032 [.81]	—	—
SA110	1	RB/RBR58	1.50	1.00	900	20.0 Meg	1.50 [38.1]	.500 [12.7]	.032 [.81]	—	—
SA111	1	RB/RBR59	2.00	1.25	1200	25.0 Meg	2.00 [50.8]	.500 [12.7]	.032 [.81]	—	—
MA200	1	-	.05	-	100	200K	.250 [6.35]	.100 [2.54]	.020 [.51]	—	—
MA201	1	-	.05	-	100	250K	.300 [7.62]	.100 [2.54]	.020 [.51]	—	—
MA202	1	-	.10	-	100	300K	.250 [6.35]	.125 [3.18]	.025 [.64]	—	—
MA203	1	-	.10	-	100	400K	.312 [7.92]	.125 [3.18]	.025 [.64]	—	—
MA204	1	-	.12	-	150	800K	.380 [9.65]	.142 [3.61]	.025 [.64]	—	—
MA205	1	-	.125	-	200	900K	.500 [12.7]	.160 [4.06]	.025 [.64]	—	—
MA206	1	-	.15	-	200	900K	.380 [9.65]	.187 [4.75]	.025 [.64]	—	—
MA207	1	-	.2	-	200	1.2 Meg	.500 [12.7]	.187 [4.75]	.025 [.64]	—	—
Q55	1	RN/RNR55	.125	.125	200	100K	.250 [6.35]	.105 [2.67]	.025 [.64]	—	—
Q60	1	RN/RNR60	.250	.250	300	150K	.380 [9.65]	.142 [3.61]	.025 [.64]	—	—
Q65	1	RN/RNR65	.500	.500	350	200K	.520 [13.20]	.188 [4.78]	.025 [.64]	—	—
Q70	1	RN/RNR70	.750	.750	500	300K	.750 [19.10]	.250 [6.35]	.032 [.81]	—	—
Q75	1	RN/RNR75	1.00	1.00	600	500K	1.02 [25.9]	.375 [9.53]	.032 [.81]	—	—
PC400	2	—	.15	—	200	500K	.250 [6.35]	.250 [6.35]	.025 [.64]	.200 [5.08]	—
PC401	2	RB/RBR71	.25	.125	400	750K	.312 [7.92]	.250 [6.35]	.025 [.64]	.200 [5.08]	—
PC402	2	—	.25	—	400	1 Meg	.375 [9.52]	.250 [6.35]	.025 [.64]	.200 [5.08]	—
PC404	2	—	.30	—	400	1 Meg	.500 [12.7]	.250 [6.35]	.032 [.81]	.200 [5.08]	—
PC405	2	—	.33	—	400	1 Meg	.375 [9.52]	.375 [9.52]	.032 [.81]	.200 [5.08]	—
PC406	2	RB70	.33	.250	400	2 Meg	.500 [12.7]	.375 [9.52]	.032 [.81]	.200 [5.08]	—
PC407	2	—	.50	—	400	2 Meg	.500 [12.7]	.500 [12.7]	.032 [.81]	.300 [7.62]	—
PC408	2	—	.63	—	400	2 Meg	.625 [15.9]	.500 [12.7]	.032 [.81]	.300 [7.62]	—
PC451	3	RNC90	0.3	0.3	300	1 Meg	.336[8.5] Max	.320[8.1] Max	.025[.64] Max	.150 [3.81]	.120
PC452	3	—	1.0	—	350	25K	.370[9.4] Max	.610[15.5]Max	.025[.64] Max	.500 [12.7]	.135
PC454	3	—	2.0	—	500	100K	.390[9.9] Max	1.12[28.4]Max	.032[.81] Max	.900 [22.9]	.260

<sup>1</sup>Military p/n's are given for reference only and do not imply qualification or exact interchangeability. <sup>2</sup>Increased ratings avail. <sup>3</sup>Max. voltage is determined by E=(PR)<sup>1/2</sup>; E not to exceed the value listed

**P/N DESIGNATION:** MA207 1003 A B

**RCD Type** [Diagram showing connections for MA207, 1003, A, B]

**Options:** X, P, HS, ER (leave blank if standard)

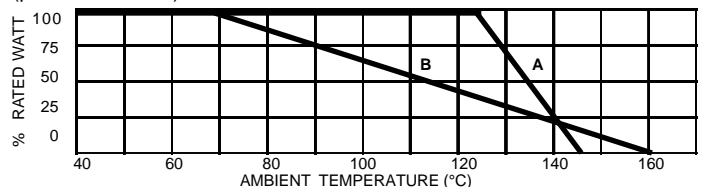
**4-Digit Resis Code:** 3 signif. digits & multiplier (R100=0.1Ω, 1R00=1Ω, 1000=100Ω, 1001=1KΩ)

**Tolerance Code:** F=1%, D=0.5%, C=0.25%, B=0.1%, A=0.05% Q=0.02%, T=0.01%, V=0.005%

**Packaging:** 'B' is bulk, 'T' is Tape & Reel

**Optional Temp. Coefficient** - leave blank for standard ('2' = ±2ppm/°C, '3'=3ppm, '5'=5ppm, '10'=10ppm, '20'=20ppm)

**POWER DERATING:** Series SA/MA/PC40 resistors shall be derated according to Curve A, Series Q & PC451 per Curve B. The power rating of resistors with 0.1% or tighter tolerance shall be reduced 50% (per Mil-Std-199).



FA017 Specifications subject to change without notice