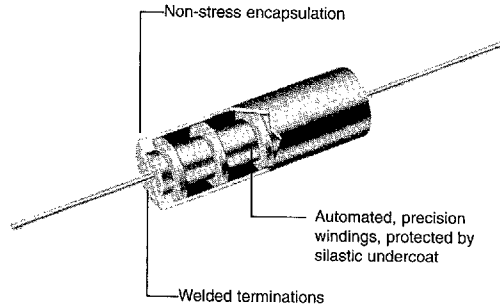




**AXIAL LEAD  
PRECISION WIREWOUND  
RESISTORS**

**HR, VA, SP,  
7000, 8000 SERIES**

**MIL-R-93 (RB) & MIL-R-39005 (RBR)  
& COMMERCIAL STYLES**



- 0.1 ohm to 12 meg ohms
- 0.1 to 1.0 watts
- Tolerance to  $\pm 0.01\%$
- Approved to M, P, & R levels
- TC's from  $\pm 2$  ppm/ $^{\circ}\text{C}$  to  $+6000$  ppm/ $^{\circ}\text{C}$
- Meets or exceeds all applicable MIL-R-93 & MIL -R-39005 ratings

These ultra precision resistors are designed and produced for critical parameter applications. They are available for established reliability military and/or commercial applications requiring state of the art precision and stability.

Construction features may vary slightly between commercial and military styles, but both are produced under the same rigid quality control system required by the tightest military specifications. Both are produced in the same production line using the same highly trained operators required to produce the established reliability product.

Whether military or commercial, all resistors are carefully monitored during assembly, winding, coating, and stabilization procedures to assure high quality standards even when their prescribed parameters are non critical. Premium grade

selected wire is control stress wound on special designed bobbins. All terminations are welded to reduce contact noise and thermal EMF. Extensive accelerated aging programs both before and after calibration assure precise initial accuracy and high resistance stability.

Encapsulation is accomplished by transfer molding with special moisture resistant epoxy or by unique dry air chamber epoxy shell technique for established reliability parts. A resilient inner coating is used to minimize internal stresses on all parts.

The established reliability military parts are burned in 100 hours at  $125^{\circ}\text{C}$  ambient as part of group A acceptance testing. Documentation and special test are available upon customer request to meet your unique requirements.

**MIL-R-39005 SPECIFICATIONS:**

| Temperature Range                                 | Standard Temperature Coefficient                             |
|---|--|
| -65 $^{\circ}\text{C}$ to +145 $^{\circ}\text{C}$ | $\pm 10$ ppm/ $^{\circ}\text{C}$ 100 $\Omega$ up             |
|   | $\pm 15$ ppm/ $^{\circ}\text{C}$ 10 $\Omega$ to 100 $\Omega$ |
|   | $\pm 30$ ppm/ $^{\circ}\text{C}$ 1 $\Omega$ to 10 $\Omega$   |
|   | $\pm 90$ ppm/ $^{\circ}\text{C}$ below 1 $\Omega$            |
|   | Special Temperature Coefficients Available                   |

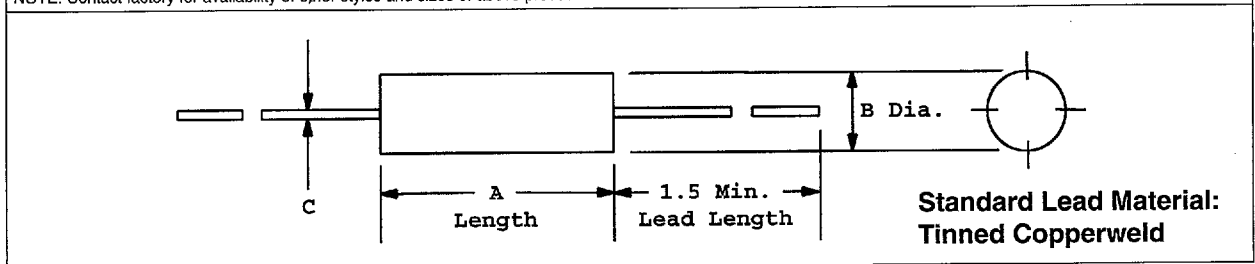


**HR, VA, SP, 7000, 8000 SERIES SPECIFICATIONS:**

| IRC/<br>Shaltcross<br>Style | MIL-R-93<br>/ 39005<br>Style | Wattage |       | Resistance (ohms) |      |                        | Max.<br>Working<br>Volt (Comm) | Dimensions             |                        |             |
|-----------------------------|------------------------------|---------|-------|-------------------|------|------------------------|--------------------------------|------------------------|------------------------|-------------|
|                             |                              | MIL     | Comm  | Mil               |      | ±0.032A<br>Inches (mm) |                                | ±0.051B<br>Inches (mm) | ±0.002C<br>Inches (mm) |             |
|                             |                              | 125°C   | 85°C  | Min               | Max  |                        |                                |                        |                        | Max         |
| 7008                        | ---                          | ---     | 0.150 | ---               | ---  | 1M                     | 300                            | 0.250 (6.3)            | 0.250 (6.3)            | 0.025 (0.6) |
| 7009/VA10                   | RB56                         | 0.125   | 0.250 | 0.1               | 127K | 1.4M                   | 200                            | 0.343 (8.7)            | 0.250 (6.3)            | 0.032 (0.8) |
| HR10                        | RBR56                        | 0.125   | 0.250 | 0.1               | 220K | 840K                   | 200                            | 0.343 (8.7)            | 0.250 (6.3)            | 0.032 (0.8) |
| VA/HR11                     | ---                          | 0.125   | 0.250 | ---               | ---  | 500K                   | 150                            | 0.295 (7.5)            | 0.250 (6.3)            | 0.032 (0.8) |
| 7010/VA12                   | RB55                         | 0.15    | 0.33  | 0.1               | 176K | 3M                     | 300                            | 0.500 (12.7)           | 0.250 (6.3)            | 0.032 (0.8) |
| HR12                        | RBR55                        | 0.15    | 0.30  | 0.1               | 332K | 1M                     | 300                            | 0.500 (12.7)           | 0.250 (6.3)            | 0.032 (0.8) |
| 7020/VA14                   | RB54                         | 0.25    | 0.50  | 0.1               | 226K | 4.4M                   | 300                            | 0.750 (19.0)           | 0.250 (6.3)            | 0.032 (0.8) |
| HR14                        | RBR54                        | 0.25    | 0.50  | 0.1               | 526K | 2M                     | 300                            | 0.750 (19.0)           | 0.250 (6.3)            | 0.032 (0.8) |
| VA32                        | ---                          | ---     | 0.50  | ---               | ---  | 2M                     | 300                            | 0.500 (12.7)           | 0.375 (9.5)            | 0.032 (0.8) |
| 7030/VA34                   | RB53                         | 0.33    | 0.66  | 0.1               | 604K | 8M                     | 500                            | 0.750 (19.0)           | 0.375 (9.5)            | 0.032 (0.8) |
| HR34                        | RBR53                        | 0.33    | 0.66  | 0.1               | 1.1M | 3M                     | 500                            | 0.750 (19.0)           | 0.375 (9.5)            | 0.032 (0.8) |
| 7040/VA36                   | RB52                         | 0.50    | 1.00  | 0.1               | 1M   | 12M                    | 750                            | 1.00 (25.4)            | 0.375 (9.5)            | 0.032 (0.8) |
| HR36                        | RBR52                        | 0.50    | 1.00  | 0.1               | 1.2M | 3M                     | 750                            | 1.00 (25.4)            | 0.375 (9.5)            | 0.032 (0.8) |
| <b>SUBMINIATURES</b>        |                              |         |       |                   |      |                        |                                |                        |                        |             |
| 7004                        | ---                          | ---     | 0.05  | ---               | ---  | 250K                   | 150                            | 0.30(7.6)              | 0.10 (2.5)             | 0.020 (0.5) |
| 7005/SP41                   | ---                          | ---     | 0.10  | ---               | ---  | 300K                   | 150                            | 0.25 (6.3)             | 0.125 (3.2)            | 0.025 (0.6) |
| 7006                        | ---                          | ---     | 0.10  | ---               | ---  | 350K                   | 200                            | 0.31 (7.9)             | 0.125 (3.2)            | 0.025 (0.6) |
| 7007/SP21                   | ---                          | ---     | 0.250 | ---               | ---  | 700K                   | 300                            | 0.375 (9.5)            | 0.188 (4.8)            | 0.025 (0.6) |
| SP22                        | ---                          | ---     | 0.30  | ---               | ---  | 300K                   | 300                            | 0.500 (12.7)           | 0.187 (4.8)            | 0.025 (0.6) |
| SP42                        | ---                          | ---     | 0.125 | ---               | ---  | 200K                   | 200                            | 0.375 (9.5)            | 0.125 (3.2)            | 0.025 (0.6) |
| 8000**                      | ---                          | ---     | 0.125 | ---               | ---  | 10K                    | 35                             | 0.375 (9.5)            | 0.140 (3.6)            | 0.025 (0.6) |
| 8001**                      | ---                          | ---     | 0.250 | ---               | ---  | 20K                    | 70                             | 0.580 (14.9)           | 0.190 (4.8)            | 0.025 (0.6) |

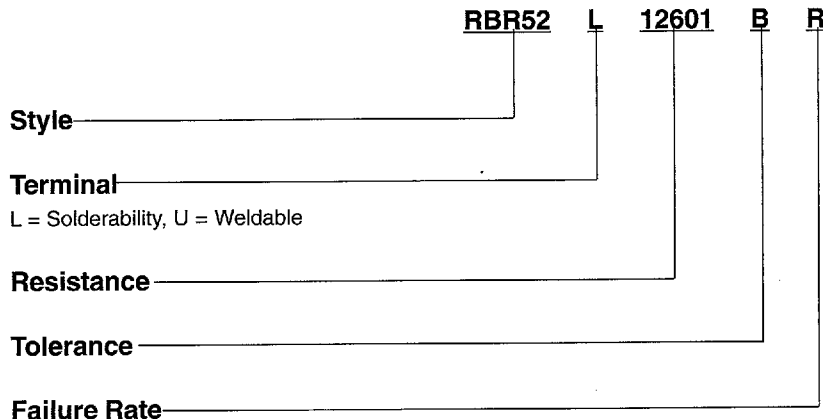
\*For all styles commercial ratings may be applied at 125°C provided 175°C max. operating temperature is permissible.  
NOTE: Contact factory for availability of other styles and sizes of above product.

\*\*Customer must specify TCR required.



**HOW TO ORDER**

Sample Part No.:



Failure Rate  
For commercial equivalents:  
Style - Resistance - Tolerance - TCR

4857242 0000959 011

WIRE AND FILM TECHNOLOGIES

Version 6.1