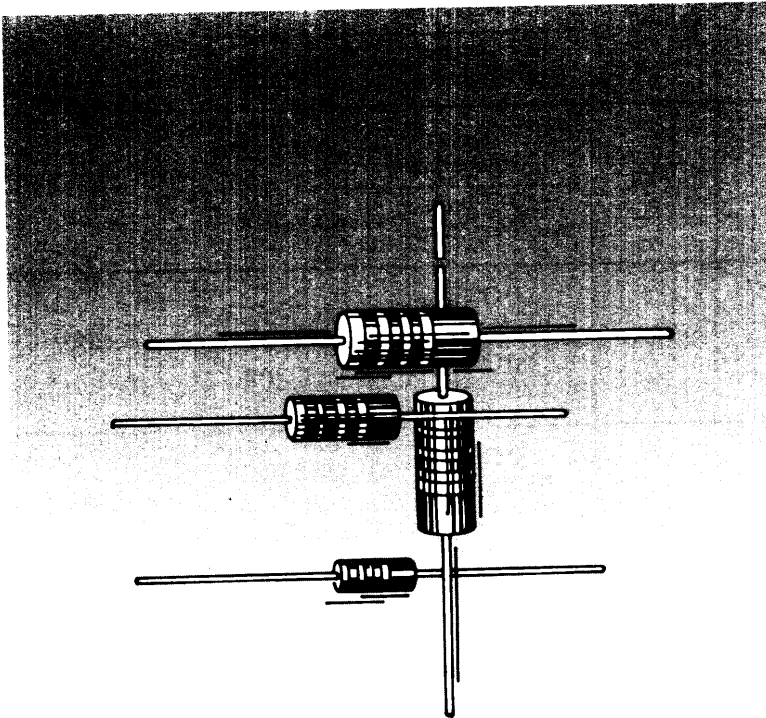


**Fixed Resistors**



<b>Selector Guide</b>	<b>2</b>
<b>Hot-Molded Carbon Composition Fixed Resistors</b>	<b>4</b>
<b>Hot Solder Dip Leads</b>	<b>12</b>
<b>Sales Offices</b>	<b>13</b>

Page  
No.

2






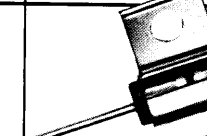
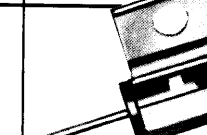
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12

13

# Fixed Resistors

## SELECTOR GUIDE: Hot-Molded Carbon Composition Fixed Resistors

Type	Power at 70°	Resistance Range <sup>1</sup>	Tolerance	Voltage Rating (RMS or DC) <sup>2</sup> $E(\text{Max}) = \sqrt{PR}$
Industrial Grade <b>BB</b> Military Grade <b>RC05</b> Military Grade-S Level <b>RCR05</b>	 1/8 Watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	150V
		2.7 Ohms to 22 Megohms	±5, 10%	
Industrial Grade <b>CB</b> Military Grade <b>RC07</b> Military Grade-S Level <b>RCR07</b>	 1/4 Watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	250V
		2.7 Ohms to 22 Megohms	±5, 10%	
Industrial Grade <b>EB</b> Military Grade <b>RC20</b> Military Grade-S Level <b>RCR20</b>	 1/2 Watt	1.0 Ohm to 100 Megohms	±5, 10, 20%	350V
		1.0 Ohm to 22 Megohms	±5, 10%	
Industrial Grade <b>GB</b> Military Grade <b>RC32</b> Military Grade-S Level <b>RCR32</b>	 1 Watt	1.0 Ohm to 100 Megohms	±5, 10, 20%	500V
		1.0 Ohm to 22 Megohms	±5, 10%	
Industrial Grade <b>HB</b> Military Grade <b>RC42</b> Military Grade-S Level <b>RCR42</b>	 2 Watts	10 Ohms to 100 Megohms	±5, 10, 20%	750V
		10 Ohms to 22 Megohms	±5, 10%	500V
Industrial Grade <b>GM</b>	 3 Watts	1.0 Ohm to 22 Megohms	±5, 10%	500V
Industrial Grade <b>HM</b>	 4 Watts	10 Ohms to 22 Megohms	±5, 10%	750V

<sup>1</sup> **Ultra-High Resistance Values**—Resistance values up to 100 gigaohms are available in the Industrial Grade BB, CB, and EB products. Contact the factory for information.

<sup>2</sup> Voltage ratings (RMS or DC) listed above are rated continuous working voltages (RCWV) at sea level. Use the equation  $E(\text{max}) = \sqrt{PR}$  to determine the maximum RCWV for any specific resistance value. In no case should it exceed those values listed above in a circuit application.

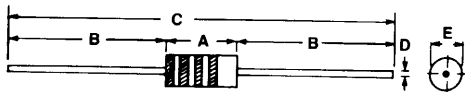


## Hot-Molded Carbon Composition Fixed Resistors

Maximum Ambient Temperature	Dimensions in Inches (millimeters)									Unit Weight (nominal)	
	A	B	C (nominal)	D	E	F	G	H	J		
+ 130°C	0.145 ± .015 (3,68 ± 0,38)	1.000 ± .125 (25,40 ± 3,18)	2.145 (54,48)	0.015 ± .003 (0,38 ± 0,08)	0.062 ± .004 (1,57 ± 0,10)						0.077gm
+ 150°C	0.250 ± .015 (6,35 ± 0,38)	1.500 ± .125 (38,10 ± 3,18)	3.250 (82,55)	0.025 ± .002 (0,64 ± 0,05)	0.090 ± .008 (2,29 ± 0,20)						0.28gm
+ 150°C	0.375 ± .031 (9,53 ± 0,79)	1.500 ± .125 (38,10 ± 3,18)	3.375 (85,73)	0.033 ± .002 (0,84 ± 0,05)	0.140 ± .008 (3,56 ± 0,20)						0.61gm
+ 150°C	0.562 ± .031 (14,27 ± 0,79)	1.500 ± .125 (38,10 ± 3,18)	3.562 (90,47)	0.041 ± .002 (1,04 ± 0,05)	0.225 ± .008 (5,72 ± 0,20)						1.45gm
+ 150°C	0.688 ± .031 (17,48 ± 0,79)	1.500 ± .125 (38,10 ± 3,18)	3.688 (93,68)	0.045 ± .003 (1,14 ± 0,08)	0.312 ± .008 (7,92 ± 0,20)						2.80gm
+ 150°C	0.562 ± .031 (14,27 ± 0,79)	1.500 ± .125 (38,10 ± 3,18)	3.562 (90,47)	0.041 ± .002 (1,04 ± 0,05)	0.225 ± .008 (5,72 ± 0,20)	0.305 ± .010 (7,75 ± 0,25)	0.438 ± .016 (11,13 ± 0,41)	0.656 ± .016 (16,66 ± 0,41)	0.167 ± .010 (4,24 ± 0,25)		4.70gm
+ 150°C	0.688 ± .031 (17,48 ± 0,79)	1.500 ± .125 (38,10 ± 3,18)	3.688 (93,68)	0.045 ± .003 (1,14 ± 0,08)	0.312 ± .008 (7,92 ± 0,20)	0.391 ± .010 (9,93 ± 0,25)	0.562 ± .016 (14,27 ± 0,41)	0.766 ± .016 (19,46 ± 0,41)	0.156 ± .010 (3,96 ± 0,25)		8.00gm

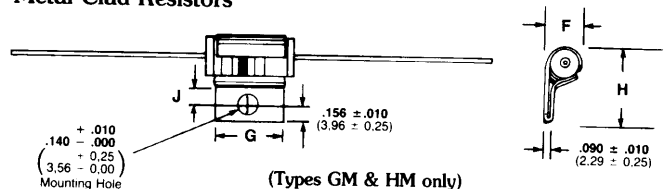
## Hot-Molded Carbon Composition Resistors

### Standard Resistors



(All Types - Ratings 1/8w through 2w)

### Metal Clad Resistors

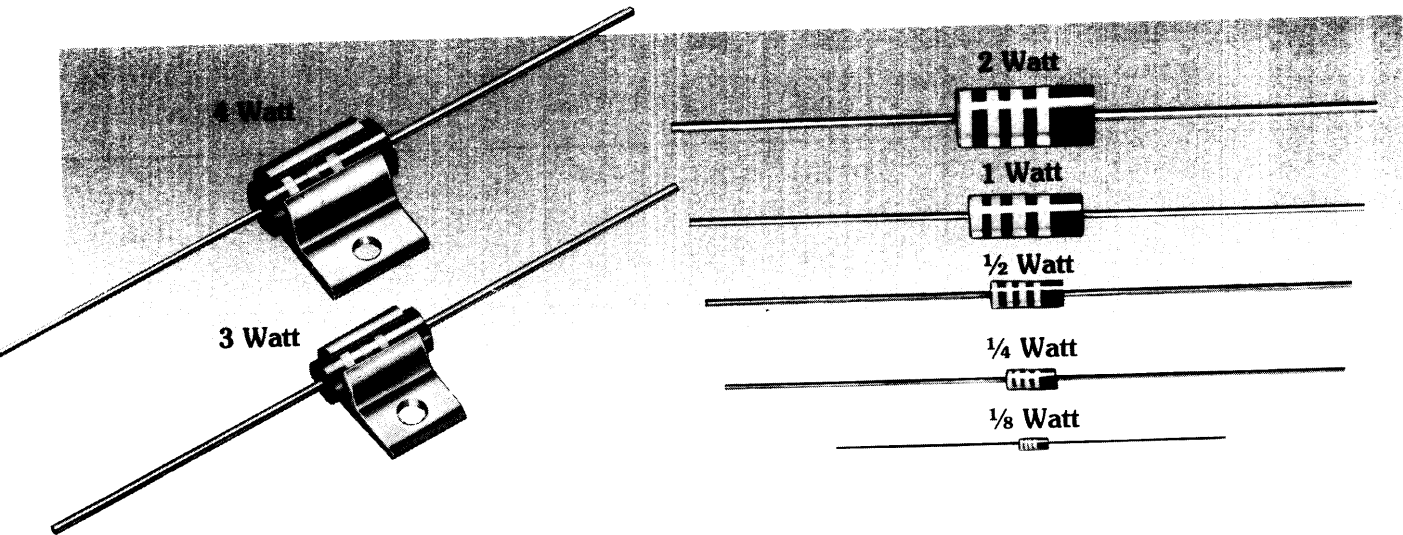


(Types GM & HM only)



# Hot-Molded Carbon Composition Fixed Resistors

( $\frac{1}{8}$ W through 4W @ 70°C)



## KEY CHARACTERISTICS

- MIL-SPEC Reliability
- Pulse Withstanding
- Power Dissipation
- High Frequency Stability

- Low Inductance
- Rugged Construction
- Dependable Performance
- Ultra-High Resistance Values

## Features and Benefits

**Uniform Quality** — Consistent performance for over 50 years! Same quality built into all parts — regardless of value, rating or tolerance. MIL-SPEC and Industrial grade parts are made using the same process.

**Reliable** — Recognized as the **most** reliable of all electronic components, Allen-Bradley Hot-Molded Carbon Composition resistors provide freedom from catastrophic failure when used within ratings.

**Predictable performance** — Because of their outstanding uniformity, Allen-Bradley Hot-Molded Carbon Composition resistors exhibit consistent responses to environment and loading.

**Conservative ratings** — All performance specifications are based on extensive testing and massive field experience.

**Rugged construction** — The solid, integral structure, combining leads, insulation, and resistance material in the exclusive Allen-Bradley hot-molding process provides exceptional strength and resistance to damage in automatic handling machinery.

**Wide range of values** — Available in standard EIA resistance values from 1 ohm to 100 megohms.

**High resistance values** — Resistance values from 100 megohms to 100 gigaohms are available on special order in Types BB, CB, and EB.

**Solderable leads** — Hot solder coated leads remain easy to solder even after long periods in stock.

**Tracking** — Allen-Bradley resistors exhibit extremely uniform tracking characteristics. For example, in flip-flop circuits, resistors used in pairs which are drawn from the same package or reel (a normal mass production practice) will track with each other throughout changes of temperature, humidity, and load. This assures reliable circuit performance throughout the design life of the equipment.

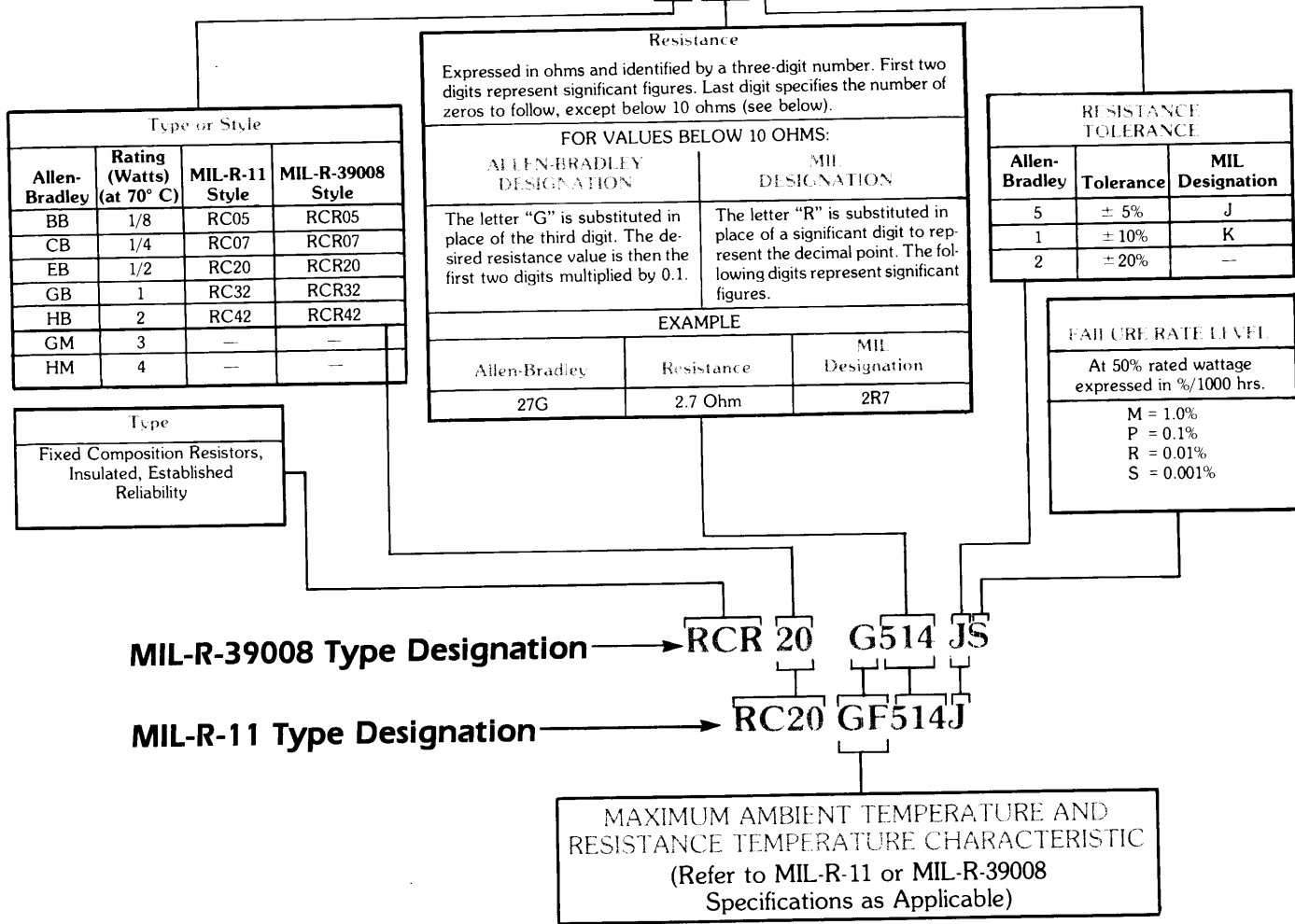
**Durable color coding** — Baked-on color code paints are resistant to solvents, and also resist the abrasion and chipping associated with automatic handling. They remain bright and easily readable even after long periods of use.

**Temperature stable** — Between 0° C and 85° C, Allen-Bradley Hot-Molded Carbon Composition resistors exhibit a very low temperature characteristic, typically less than two percent deviation from room temperature values, less in low resistance values.

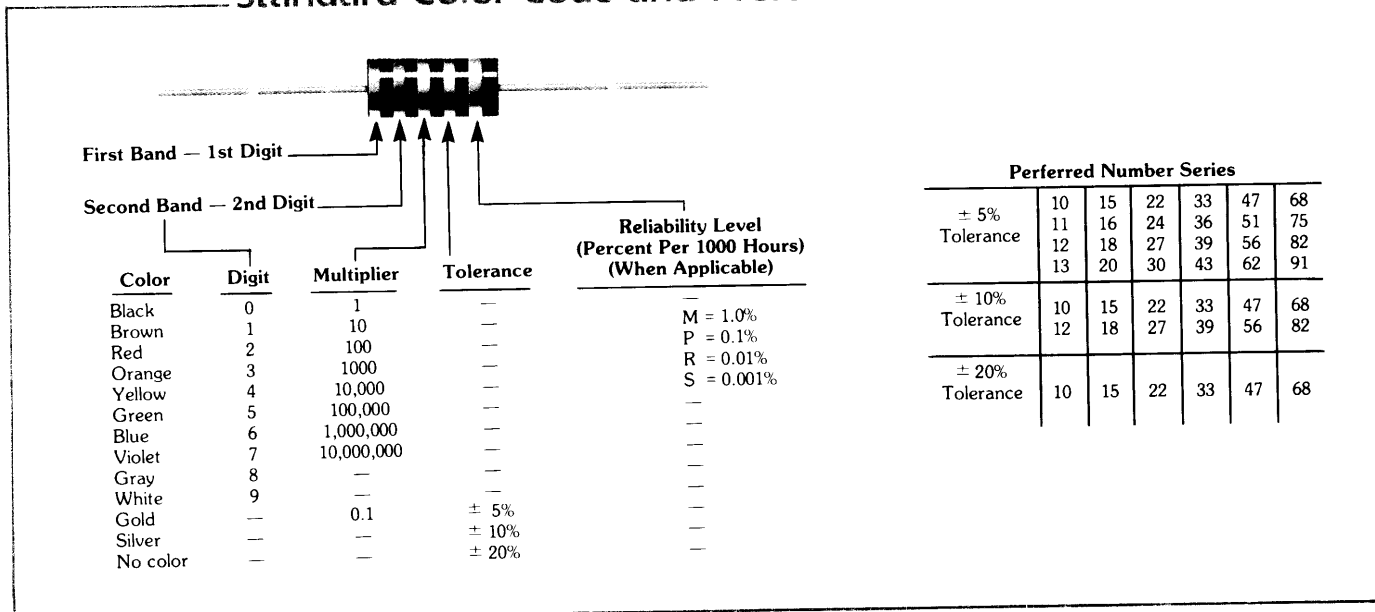
# Explanation of Part Numbers

All Allen-Bradley Hot-Molded Carbon Composition resistors are identified by a Part Number which will provide information as to the type of resistor, resistance value, and tolerance. The Part Number is merely for identification on drawings, specifications, ordering, and other areas where it is convenient to use a Part Number to describe a particular resistor. The only markings that appear on the resistor are the Color Code bands.

## Industrial Type Designation → EB5145

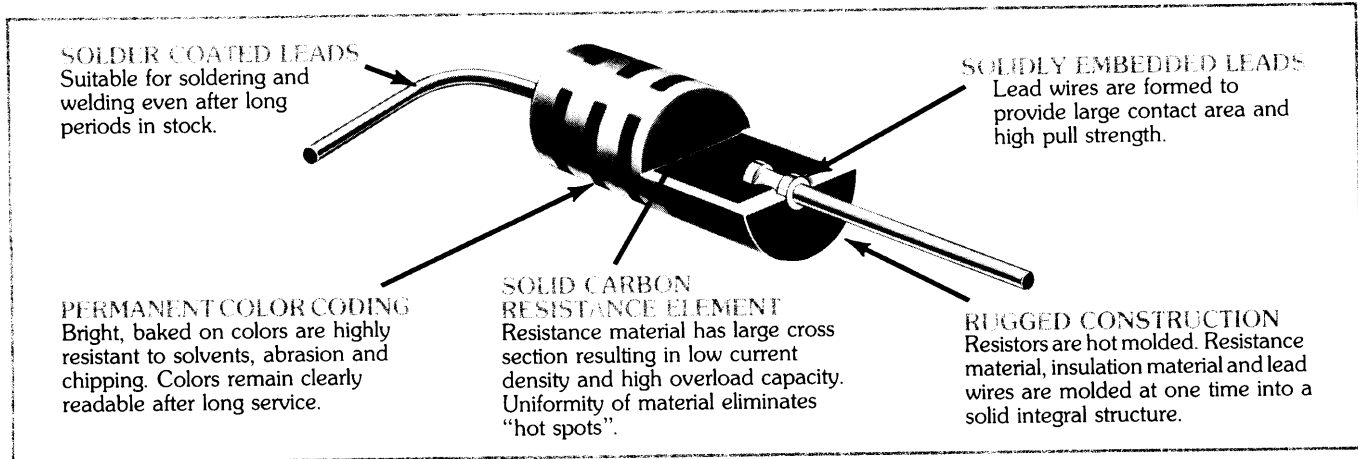


## Standard Color Code and Preferred Number Series



# Important Electrical and Mechanical Characteristics

## Hot-Molded Carbon Composition Fixed Resistors



### ■ TEST VOLTAGE ■ EFFECT OF MOISTURE ■ CONDITIONING

**Moisture absorption and the use of too low test voltages will cause the resistance value to read higher than when measured under standard conditions. It is important to understand these characteristics to facilitate using the parts effectively.**

**Resistance measurement** — Measured resistance value is dependent upon the resistor temperature, the test voltage, and the dryness of the resistor. Accurate correlation between repeated measurements, especially at different times, and different locations, requires that these three conditions be essentially the same.

**Resistor temperature** — Slight variations in resistor body temperature are not significant in room temperature measurements. However, the temperature of the resistor body may increase appreciably when tested at too high a voltage or when the voltage is applied for too long a time, causing excessive heating.

**Resistor test voltage** — The test voltage is very important and sometimes misunderstood or overlooked. This is because a tester is often unaware of the actual voltage that the instrument used is applying to the resistor under test. Commonly used instruments, such as highly accurate resistance bridges, digital voltmeters, or ATE devices, employ relatively low voltages to make measurements (usually between 0.1 volt and 1.0 volt and seldom higher than 10 volts). This does not cause significant differences for low resistance values, where the use of low test voltages is specified; however, for higher resistance values, such as, 100K ohms or higher, a test voltage of 100 volts is specified and use of a low voltage test instrument will result in readings higher than actual value. For reference purposes, the voltages listed below should be used to obtain an accurate measure of the resistance value:

Nominal Resistance Range	Recommended Test Voltage (DC Volts)	
	Without Voltage Coefficient Factor (p. 7)	With Voltage Coefficient Factor (p. 7)
1.0 to 9.1 ohms	0.3	.5
10 to 91 ohms	1.0	.5
100 to 910 ohms	3.0	.5
1000 to 9100 ohms	10.0	10
10K to 91K ohms	30.0	10
100K ohms and higher	100.0	10

Consult the table on Page 7 to obtain the appropriate Resistance-Voltage Coefficient application factors (%/Volt) for different test voltages.

**Effect of moisture absorption** — Moisture attraction is a generic characteristic of carbon, and when the Hot-Molded Carbon Composition resistor absorbs moisture, e.g., during shipment and storage, its resistance value will always increase. Under high humidity conditions it is not unusual for parts to increase 6% in resistance value in as little as 72 hours. The characteristic is reversible, and dehumidifying the parts is easily accomplished either by storing them in a controlled, low-humidity area or by conditioning them in a convection oven at 100° C. The chart below lists the proper conditioning parameters.

Rating	Conditioning Time @ 100° C
1/8W	25 Hours
1/4W	50 Hours
1/2W	75 Hours
1W	120 Hours
2W	130 Hours

**Solderability** — Allen-Bradley Hot-Molded Carbon Composition resistors meet the solderability requirements of MIL-R-39008 and MIL-STD-202, Method 208.

**Resistance to solvents** — The color code remains legible after resistors are subjected to the Resistance To Solvents test of MIL-STD-202, Method 215.

**Military qualification** — The Allen-Bradley Hot-Molded Carbon Composition resistors meet or exceed all applicable military specifications including MIL-R-39008, Resistors, Fixed, Composition (Insulated), Established Reliability, and are fully qualified in all wattage sizes and all resistance values to the best reliability level, the "S" level, with a failure rate lower than 0.001 % per 1000 hours.

# Performance Characteristics

Characteristics		Hot-Molded Carbon Composition Resistors					
		1/8 Watt Type BB	1/4 Watt Type CB	1/2 Watt Type EB	1 Watt Type GB	2 Watt Type HB	
<b>Insulation Resistance</b> Minimum		10,000 megohms	10,000 megohms	10,000 megohms	10,000 megohms	10,000 megohms	
<b>Dielectric Withstanding Voltage</b>	At Sea Level Atmospheric Press.	300 volts	500 volts	700 volts	1000 volts	1500 volts	
	At 3.4" (86.36 mm) Hg (Simulated 50,000 ft. [15240 meters])	200 volts	325 volts	450 volts	625 volts	625 volts	
<b>Resistance-Voltage Coefficient</b> Maximum instantaneous change in resistance per volt based on $\Delta R$ for $\Delta V$ of (1.0-0.1) RCWV. <b>Nominal Resistance</b> (ohms)	10K	- 0.020%/volt	- 0.015%/volt	- 0.010%/volt	- 0.007%/volt	- 0.010%/volt	
	100K	- 0.030	- 0.020	- 0.015	- 0.012	- 0.015	
	1 Meg	- 0.045	- 0.025	- 0.020	- 0.015	- 0.020	
	10 Meg	- 0.050	- 0.030	- 0.030	- 0.020	- 0.020	
	22 Meg	- 0.050	- 0.035	- 0.035	- 0.020	- 0.020	
	100 Meg	- 0.055	- 0.035	- 0.035	- 0.025	- 0.025	
<b>Load Life</b> 1000 hours operating at RCWV at 70° C ambient for duty cycle of 1 1/2 hour "on", 1/2 hour "off". Permanent resistance change.	Maximum	+ 4% - 6%	+ 4% - 6%	+ 4% - 6%	+ 4% - 6%	+ 4% - 6%	
	Typical	- 3%	- 3%	- 3%	- 3%	- 3%	
<b>Load Life (temperature-derated)</b> 1000 hours (1 1/2 hour "on", 1/2 hour "off") at RCWV derated per temperature. Tested at temperatures between 70°C and maximum ambient temperature. Permanent resistance change, modified with respect to voltage applied, as described above.]	Maximum	+ 4% - 6%	+ 4% - 6%	+ 4% - 6%	+ 4% - 6%	+ 4% - 6%	
	Typical	- 4%	- 4%	- 4%	- 4%	- 4%	
<b>Short-Time Overload</b> 5 seconds at 2 1/2 times RCWV; voltage limit as stated. Maximum permanent resistance change.	Voltage Limits	200 volts	400 volts	700 volts	1000 volts	1000 volts	
	Maximum	$\pm(2.5\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	
	Typical	+ 0.5%	+ 0.5%	+ 0.5%	+ 0.5%	+ 0.5%	
<b>Terminal Strength</b> 5 lb. (2.27 Kgm) Pull Test. Three turn Twist Test. Maximum permanent resistance change.		$\pm(1\% + 0.05 \text{ ohm})$ (2 lb. Pull Test) (0.91 Kgm)	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	
<b>Effect of Solder Heat</b> Leads immersed to .125 in. (3.18 mm) of body in 350°C solder for 3 seconds. Maximum permanent resistance change.		$\pm(2\% + 0.05 \text{ ohm})$ (250°C Solder)	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(3\% + 0.05 \text{ ohm})$	$\pm(3\% + 0.05 \text{ ohm})$	$\pm(3\% + 0.05 \text{ ohm})$	
<b>Vibration</b> 10-2000 Hz, 0.06 inch (1.52 mm) peak-to-peak or 20G, whichever is less.	Mechanical or Electrical Damage	No Damage	No Damage	No Damage	No Damage	No Damage	
	Maximum Permanent Resistance Change	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	$\pm(1\% + 0.05 \text{ ohm})$	
<b>Shock</b> 100g, 6 ms, sawtooth, 10 shocks, 2 planes.	Mechanical or Electrical Damage	No Damage	No Damage	No Damage	No Damage	No Damage	
	Maximum Permanent Resistance Change	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	
<b>Moisture Resistance</b> Temporary resistance change.	Maximum	+ 15% - 0	+ 12% - 0	+ 14% - 0	+ 8% - 0	+ 7% - 0	
	Typical	+ 9%	+ 6%	+ 7%	+ 5%	+ 4%	
<b>Humidity Characteristic (steady state)</b> 240 hours at + 40° C and 95% relative humidity. Temporary resistance change. <b>Nominal Resistance</b> (ohms)	10	Maximum	+ 8% - 0	+ 5% - 0	+ 4% - 0	+ 3% - 0	+ 1% - 0
		Typical	+ 4%	+ 3%	+ 2%	+ 2%	+ 1%
	1000	Maximum	+ 9% - 0	+ 6% - 0	+ 6% - 0	+ 4% - 0	+ 4% - 0
		Typical	+ 5%	+ 4%	+ 4%	+ 2%	+ 2%
	100K	Maximum	+ 11% - 0	+ 9% - 0	+ 8% - 0	+ 5% - 0	+ 5% - 0
		Typical	+ 8%	+ 6%	+ 6%	+ 3%	+ 2.5%
10 Meg. and 100 Meg.	Maximum	+ 13% - 0	+ 10% - 0	+ 9% - 0	+ 5% - 0	+ 5% - 0	
	Typical	+ 9%	+ 8%	+ 7%	+ 3%	+ 2.5%	
<b>Low Temperature Operation</b> After 1 hour at - 65, + 0 - 5° C, apply RCWV for 45 minutes. Remove RCWV, return to room temperature. Resistance change measured 24 hours after test.	Maximum	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	
	Typical	+ 0.5%	+ 0.5%	+ 0.5%	+ 0.5%	+ 0.5%	
<b>Temperature Cycling</b> Limits: - 55° C and + 85° C. Resistance change after five cycles.	Maximum	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	$\pm(2\% + 0.05 \text{ ohm})$	
	Typical	+ 0.5%	+ 0.5%	+ 0.5%	+ 0.5%	+ 0.5%	

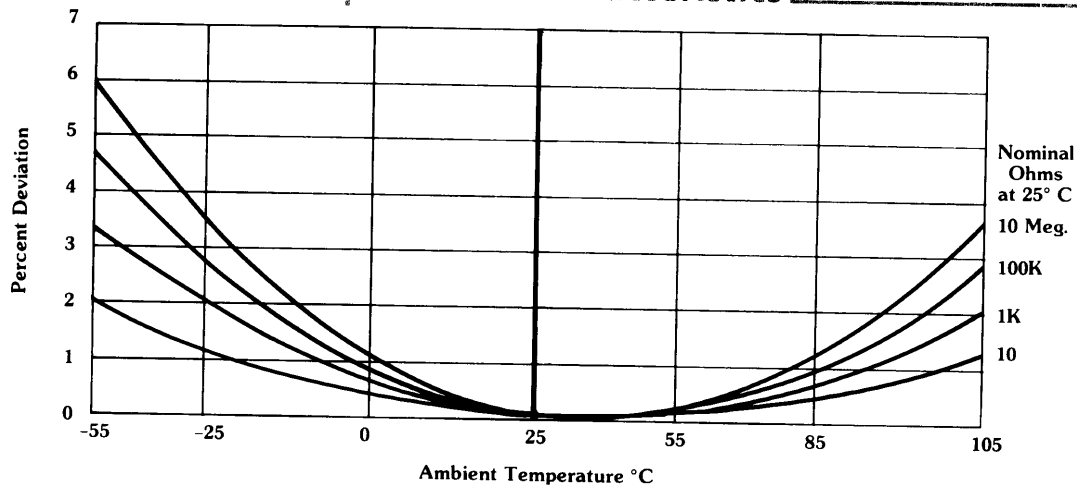
## Temperature Characteristics

In addition to the maximum values given in this table, typical curves of temporary resistance change due to temperature are illustrated below.

Resistance - Temperature Characteristic [6.3]	-55° C	-25° C	-15° C	0° C	+25° C	+55° C	+65° C	+85° C	+105° C
	Range (%)	Range (%)	Range (%)	Range (%)	Nominal Ohms	Range (%)	Range (%)	Range (%)	Range (%)
	+0.2 to + 3.8	-0.2 to + 2.0	-0.2 to + 1.5	-0.2 to + 0.9	1	-1.1 to + 0.5	-1.5 to + 0.7	-2.0 to + 1.3	-2.5 to + 2.0
	+0.2 to + 2.6	-0.2 to + 1.3	-0.2 to + 1.0	-0.2 to + 0.6	2.7	-0.4 to + 0.5	-0.5 to + 0.7	-0.5 to + 1.3	-0.4 to + 2.0
	+0.2 to + 3.8	-0.3 to + 2.0	-0.3 to + 1.5	-0.3 to + 0.9	10	-0.6 to + 0.8	-0.7 to + 1.1	-0.8 to + 2.0	-0.6 to + 3.0
	+0.3 to + 5.1	-0.3 to + 2.7	-0.4 to + 2.0	-0.4 to + 1.1	100	-0.8 to + 1.0	-0.9 to + 1.5	-1.0 to + 2.6	-0.8 to + 4.0
	+0.3 to + 6.4	-0.4 to + 3.4	-0.5 to + 2.5	-0.5 to + 1.4	1000	-1.0 to + 1.3	-1.2 to + 1.8	-1.3 to + 3.3	-1.0 to + 5.0
	+0.4 to + 7.7	-0.5 to + 4.0	-0.6 to + 3.0	-0.6 to + 1.7	10K	-1.2 to + 1.5	-1.4 to + 2.2	-1.5 to + 3.9	-1.2 to + 6.0
	+0.5 to + 8.9	-0.6 to + 4.7	-0.7 to + 3.5	-0.7 to + 2.0	100K	-1.4 to + 1.8	-1.6 to + 2.6	-1.8 to + 4.6	-1.4 to + 7.1
	+0.5 to + 10.2	-0.7 to + 5.4	-0.9 to + 4.0	-0.8 to + 2.3	1 Meg	-1.6 to + 2.0	-1.9 to + 3.0	-2.0 to + 5.2	-1.6 to + 8.1
	+0.6 to + 11.5	-0.8 to + 6.0	-0.9 to + 4.5	-0.9 to + 2.6	10 Meg	-1.8 to + 2.3	-2.1 to + 3.3	-2.3 to + 5.9	-1.8 to + 9.1
	+0.6 to + 11.9	-0.8 to + 6.3	-0.9 to + 4.7	-0.9 to + 2.6	22 Meg	-1.9 to + 2.4	-2.2 to + 3.5	-2.4 to + 6.1	-1.9 to + 9.4
	+0.7 to + 12.8	-0.8 to + 6.7	-1.0 to + 5.0	-0.9 to + 2.8	100 Meg	-2.0 to + 2.5	-2.4 to + 3.7	-2.5 to + 6.6	-2.0 to + 10.1

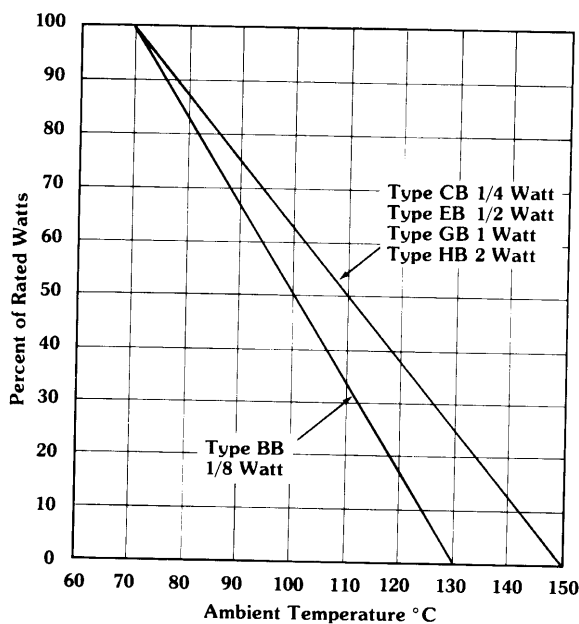
Maximum temporary resistance change from the +25° C initial resistance value. Note - Linear interpolation approximates intermediate values.

## Typical Resistance - Temperature Characteristics



Percent Resistance Deviation from 25°C Value for Various Nominal Resistance Values and Temperatures.

## Derating with Respect to Ambient Temperature

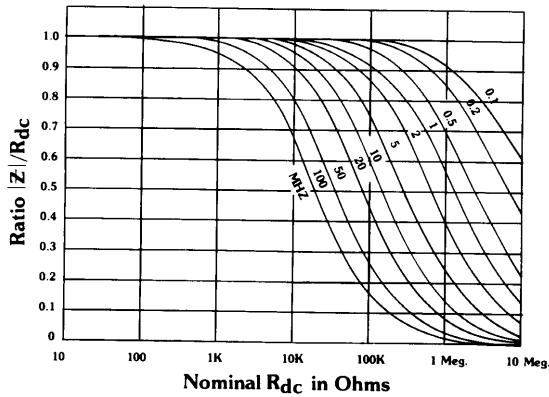


Derating -- For resistors operated in ambient temperatures above 70°C, the change in resistance after 1000 hours under conditions similar to the Load Life Test will be less than +4% to -6% when the load wattage is derated in accordance with the curve shown. The most significant factor in proper derating to achieve minimal permanent resistance change over long periods of operation is the resultant surface temperature of the resistor.

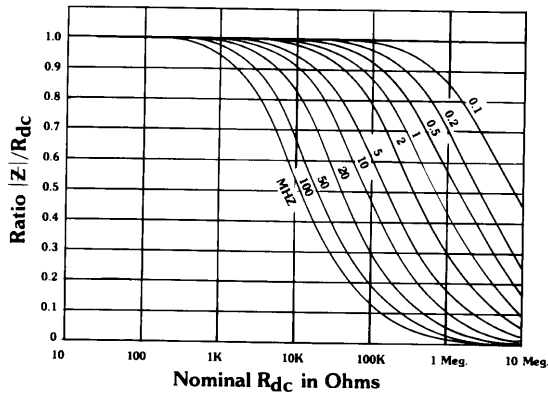
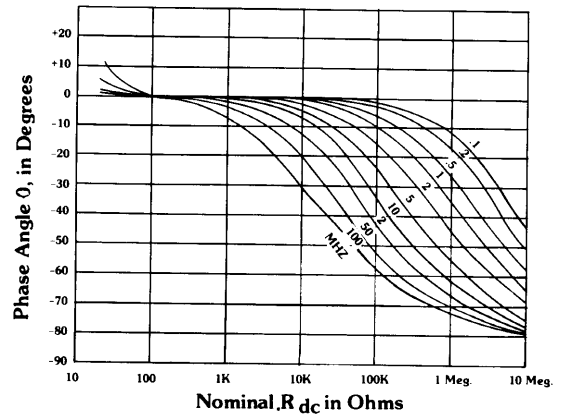


# Typical High Frequency Characteristics

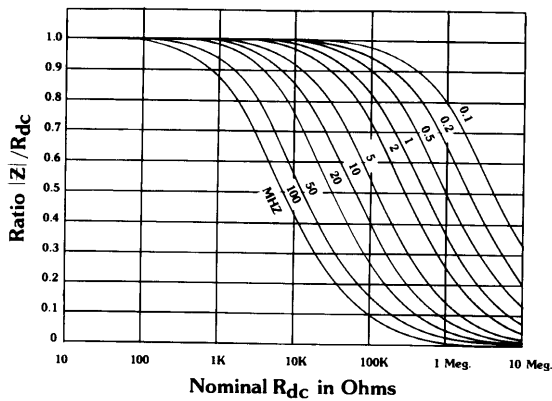
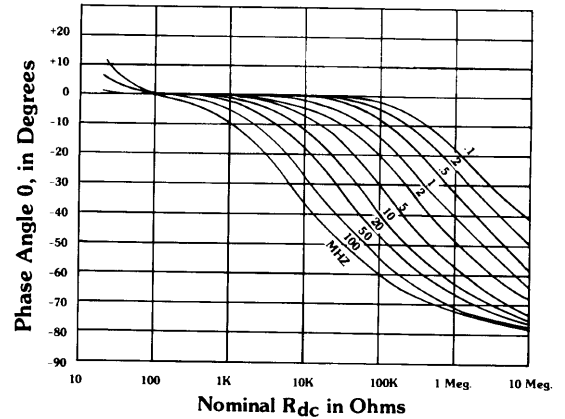
Measurement conditions -- The curves below give typical values of impedance to DC resistance ratio and phase angle from 100 KHz to 100 MHz. Care was taken in test fixture design to prevent distributed capacitance-to-ground along the length of the resistor from contributing to measured values. Lead length was held at one-quarter inch to standardize the lead inductance contribution. User's circuit variations from test conditions in mounting position and lead length can have a significant effect on the high frequency characteristics.



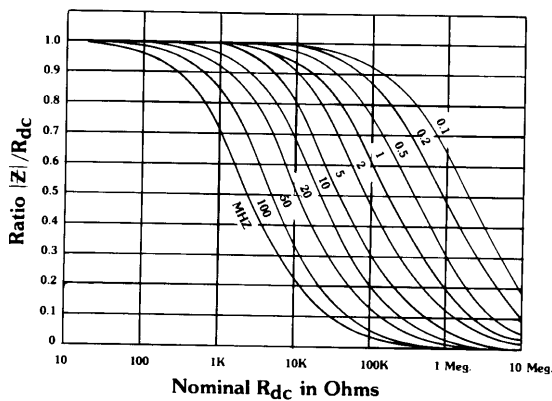
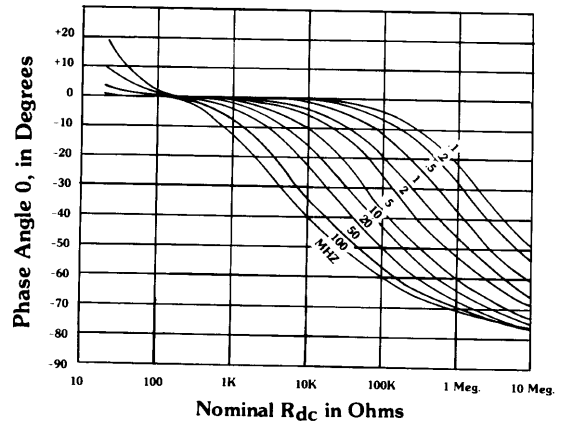
1/8W (Types BB, RC05 & RCR05)  
& 1/4W (Types CB, RC07 & RCR07)



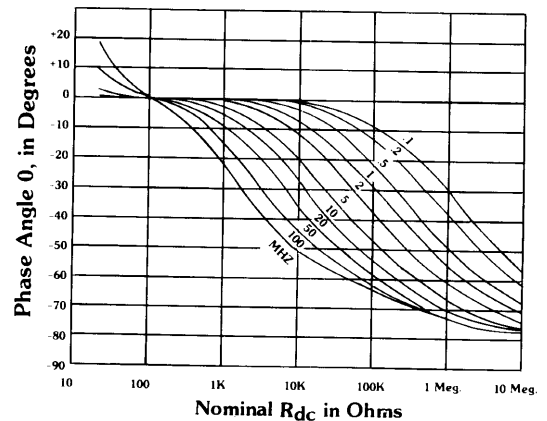
1/2W (Types EB, RC20 & RCR20)



1W (Types GB, RC32 & RCR32)



2W (Types HB, RC42 & RCR42)



## Packaging Methods for Allen-Bradley Hot-Molded Carbon Composition Resistors

Allen-Bradley Hot-Molded Carbon Composition resistors are packaged to ensure maximum protection during shipment and storage, and maximum utility during end product circuit assembly operations. Two types of packaging are available to choose from: double lead tape

reels and natural copolymer clam shells. (Note: 1/8 W resistors are packed in the clam shells for distribution and in boxes for non-distributors.) The chart below lists this bulk packaging information for reference:

### Standard Bulk Packaging Quantities

A-B TYPE	BB RC05 RCR05	CB RC07 RCR07	EB RC20 RCR20	GB RC32 RCR32	HB RC42 RCR42
Qty per clam shell	100	100	100	50	25
Clam shells per carton	5	10	5	5	5
Qty per carton	500	1,000	500	250	125
Qty per box	1000	N/A	N/A	N/A	N/A

## Allen-Bradley Tape Reel Packaging

Allen-Bradley offers a wide variety of double lead tape reel options to support automatic assembly operations. The octagon reels are made using corrugated fiberboard sides glued to a strong fiberwound core. Each reel is provided with metal bearings having a 0.562" (14,27 mm) diameter hole for simple mounting on automatic assembly equipment. The reels are disposable after use. Although the adhesive tape used is of the highest quality, storage for more than one year is not recommended due to normal adhesive aging. A minimum of 12" (304,80 mm) of free tape is provided at each end of a reel to facilitate setup

and splicing. To ensure proper alignment and trouble-free feeding, interliner paper is wound between all layers throughout the reels of 1/8 and 1/4 Watt and is optional on other wattage sizes. One turn of corrugated wrapping is added to the outside of each reel to protect the parts during shipping, handling and storage. The following information is provided to assist in the selection of the desired type of tape reel packaging. Please note that not all tape reel types conform to E.I.A. Standard RS-296-E and care must be taken to select the proper type.

# Allen-Bradley Resistor Tape and Reel Packaging Guide

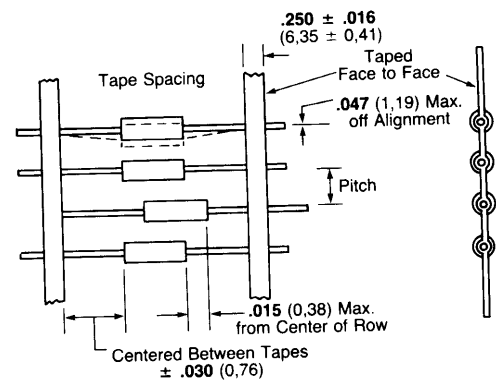
A-B Type	Rating	Tape Spacing	Pitch	Qty. Reel
BB RC05 RCR05	1/8W	2.062"	.200"	2,000
		1.812"	.200"	2,000
		1.930"	.200"	2,000
CB RC07 RCR07	1/4W	2.062"	.200"	2,500
		2.812"	.200"	2,500
		2.062"	.200"	5,000
		2.874"	.200"	2,500
EB RC20 RCR20	1/2W	2.062"	.200"	2,500
		2.812"	.200"	2,500
		2.500"	.200"	2,500
		2.874"	.200"	2,500
GB RC32 RCR32	1W	2.874"	.375"	2,000
		3.062"	.375"	2,000
		2.062"	.375"	2,000
		2.500"	.375"	2,000
HB RC42 RCR42	2W	2.874"	.375"	1,000
		3.062"	.375"	1,000
		2.062"	.375"	1,000
		2.500"	.375"	1,000

## Important Packaging Comments:

The overall length of the 1/8W resistor is 2.145" (54,48 mm). At the 2.062" tape spacing, the leads are captured approximately .065" within the tape.

The width of the tape is 0.250" (6,35 mm). The overall length of wattage sizes 1/4W, 1/2W, 1W, and 2W is such that the leads would extend beyond the tape. The excess leads will be trimmed near the outside edges of the lead tape and the resultant resistor leads will be shortened accordingly with reference to the tape spacing selected.

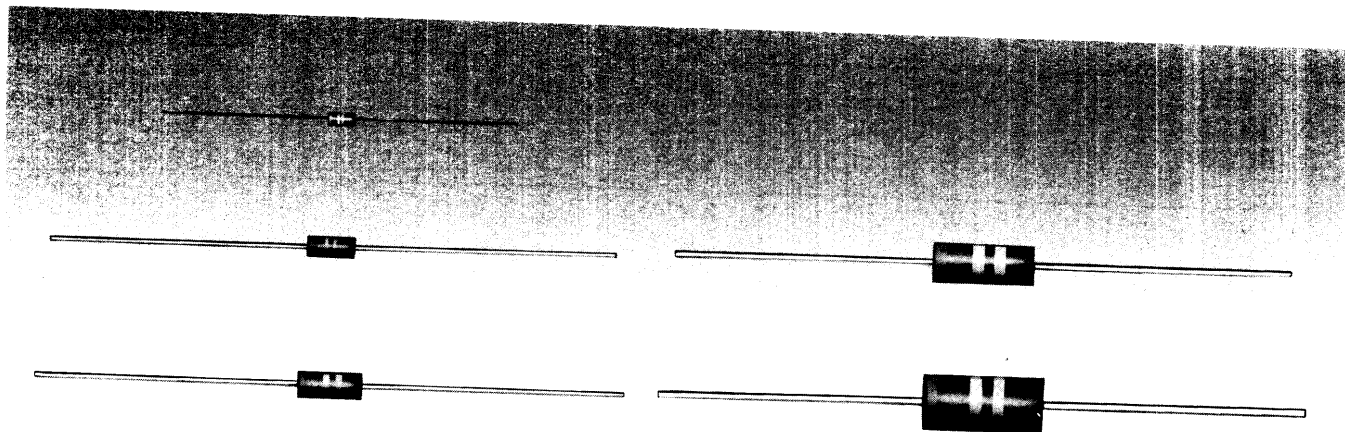
Reel quantities for 1/2, 1, and 2 Watt resistors will vary from those listed above when optional interliner paper is specified throughout the reel.



# Hot Solder Dip Leads for RCR Product



1/8, 1/4, 1/2, 1, and 2 Watts  
1 Ohm to 22 Megohm



## Key Characteristics

- Meets Naval Weapons - WS-6536
- Meets MIL-STD-202 Method 208
- Enhance Solderability
- Extends Shelf Life
- 8-Hour Steam Age

## General

The information described here is considered appropriate for evaluation of hot-solder dip leads for Allen-Bradley Carbon Composition Resistors.

Our eutectic solder coating (63/37Sn/Pb) is tested and approved to MIL-STD-202, Method 208 (8-hour steam age).

## Features and Benefits

Meets the Naval Weapons requirement WS-6536. This increases the integrity of the thru-hole solder joint: thus, improving component solderability.

**Uniform Quality** — Meets MIL-STD-202 Method 208. Consistently meets the new 8-hour steam aging requirement for solderability.

**Environmental Protection** — This value added feature extends component shelf life by protecting the leads from environmental conditions.

**Reliability** — This feature enhances the board level performance of the Allen-Bradley Carbon Composition Resistor that is recognized as the most reliable of all electronic components.

**Packaging Options** — The hot-solder dip leads are available with all current packaging options in bulk or tape and reel.

# Sales Offices

## Headquarters

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For sales assistance or product information, contact a Customer Service Representative in El Paso.

### EL PASO, TEXAS

Allen-Bradley Co., Inc.  
Electronic Components Business  
1414 Allen-Bradley Drive  
El Paso, TX 79936  
Tel: 800/592-4888  
915/592-4888  
FAX: 915/594-8922

## Domestic Distributors

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### Hammond Electronics

1230 W. Central Blvd.  
Orlando, FL 32805  
Tel: 407/849-6060  
FAX: 407/843-3316

### Ohm Electronics

746 Vermont Ave.  
Palatine, IL 60067  
Tel: 708/359-5500  
FAX: 708/359-9686

### Newark Electronics

4801 Ravenswood  
Chicago, IL 60640  
Tel: 312/784-5100  
FAX: 312/907-5217

### Marsh Electronics

1563 S. 101st St.  
Milwaukee, WI 53214  
Tel: 414/475-6000  
FAX: 414/771-2847

### Kent Electronics

7433 Harwin Dr.  
Houston, TX 77036  
Tel: 713/780-7770  
FAX: 713/978-5892

### TTI, Inc.

2441 NE Parkway  
Fort Worth, TX 76106  
Tel: 817/740-9000  
FAX: 817/740-9898

## International Distributors

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### DENMARK

Dan-Contact A/S  
Smakkegaardsvej 145  
DK-2820 Gentofte, Denmark  
Tel: 45-31-68-36-33  
FAX: 45-31-68-33-62

### INDIA

Pamir Electronics  
603 N. Gordon Drive  
Gordon Park  
Exton, PA 19341  
Tel: 610/594-8337  
FAX: 610/594-8559

### SWITZERLAND

EM Egli AG Zurich  
Bauteile Und Steuersysteme  
Postfach CH-8123  
Lohwisstrasse 52  
Ebmingen, Switzerland  
Tel: 41-1-980-1111  
FAX: 41-1-980-0869

### FRANCE

CED-Euromega s.a.  
121-135 Avenue du Docteur Vaillant  
93230 Romainville, France  
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FAX: 33-14-844-2020

### ITALY

Special-IND SPA  
Per L'Industria SPA  
Piazza Spotorno 3  
1-20159 Milano, Italy  
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FAX: 39-2-66-800-493

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Hampshire, GU34 2QL England  
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FAX: 44-420-544450

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FAX: 49-40-23-0385

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Tel: 46-8-629-1400  
FAX: 46-8-627-0280

### TTI, Inc.

Suite 5, Regency House  
Dedmore Road  
Marlow, Bucks SL7 1FJ England  
Tel: 44-0628-487884  
FAX: 44-0628-473050

### TTI, Inc.

Zeppelin Str. 4  
D82178 Puchheim/Munich, Germany  
Tel: 49-89-890-153-0  
FAX: 49-89-890-153-99

## Terms and Conditions of Sale

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As stated in the Allen-Bradley Company, Inc. Terms and Conditions of Sale Publication 6500 (most current revision).  
Additional specifications available in Publication ROFR - March 1990.