

Resistors

Objectives:

- Identify the purpose of a resistor.
- Identify the unit of resistance as the ohm (Ω).
- Identify the resistor reference designator code.
- Identify resistor schematic symbols.
- Identify fixed resistors.
- Identify variable resistors.
- Define power rating.
- Define tolerance.
- Identify number/ letter codes.

Types of Fixed Resistors.

General Purpose Resistors are inexpensive and most common



Power resistors are used for large current applications.
Typically wire-wound.



Precision resistors are used when tight tolerance is an issue.



Types of General Purpose Carbon Resistors

Carbon Film: Strip of carbon around a core.
Length determines resistance.

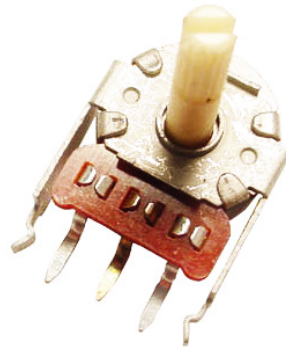
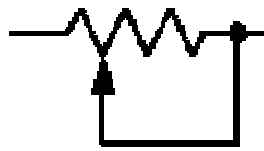
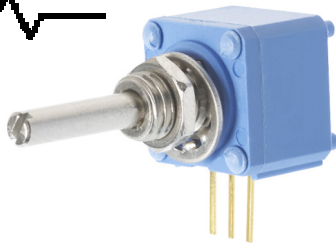
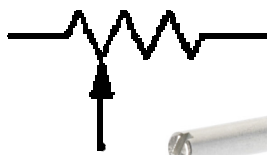


Carbon Composition: mixture of material, mostly Carbon.
Amount of other material determines resistance.

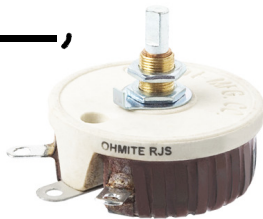


Variable Resistors

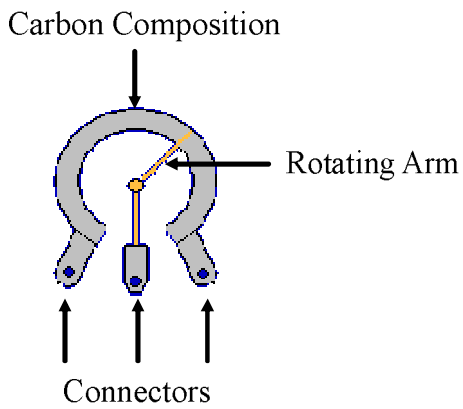
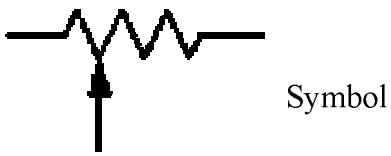
Potentiometers



Rheostats



Potentiometers



Has three connectors.

Controls small amounts of current.

Rheostats



Has two connectors.

Controls large amounts of current.

General Characteristics

Power Rating: size of a resistor.

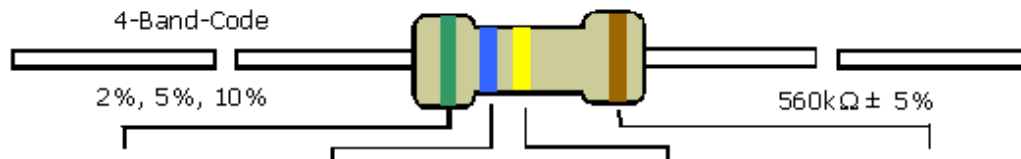
Tolerance: percent error.

Ohmic value: Resistance rating.

Watts (W)

%

Ω



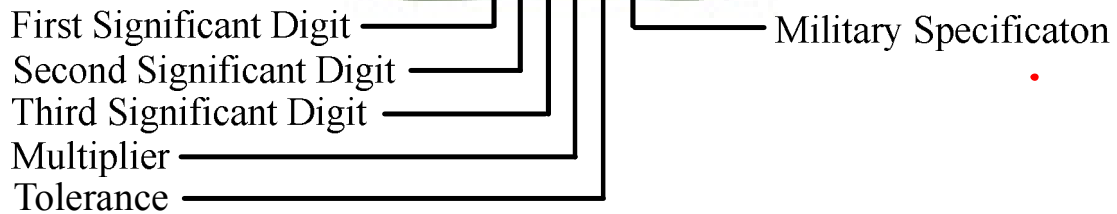
COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER	TOLERANCE
Black	0	0	0	1Ω	
Brown	1	1	1	10Ω	± 1% (F)
Red	2	2	2	100Ω	± 2% (G)
Orange	3	3	3	1KΩ	
Yellow	4	4	4	10KΩ	
Green	5	5	5	100KΩ	±0.5% (D)
Blue	6	6	6	1MΩ	±0.25% (C)
Violet	7	7	7	10MΩ	±0.10% (B)
Grey	8	8	8		±0.05%
White	9	9	9		
Gold				0.1	± 5% (J)
Silver				0.01	± 10% (K)



Electronix Express / RSR
<http://www.elexp.com>

1-800-972-2225
 In NJ 732-381-8020

Precision Resistors



- F= 1% G= 2% D= .5%
 C= .25% B= .1% J= 5%
 K= 10%

RN65D

First Letter: R = Resistor
 Second Letter: N = Metal Film;
 W= Wire Wound; CR= Carbon

#: 55= 1/8 Watt; 60= 1/4 Watt; 65= 1/2 Watt

Last Letter: Temperature Coefficient (how much you can expect the ohmic value to change due to temperature variations.)

Resistor Assignment

Write down the value of the Resistor in Ohms and its tolerance.

- | | |
|--------------------------------|------------|
| 1. Red, Black, Orange | 11. 3332GJ |
| 2. Green, Brown, Red, Gold | 12. 5473KJ |
| 3. Blue, Grey, Brown, Silver | 13. 9864CJ |
| 4. Green, Black, Brown, Gold | 14. 7351DJ |
| 5. Red, Red, Orange | 15. 5844BJ |
| 6. Grey, Green, Red, Silver | 16. 2106JJ |
| 7. Brown, Green, Red, Gold | 17. 8204FJ |
| 8. Yellow, Violet, Brown | 18. 7332JJ |
| 9. Green, Blue, Red, Gold | 19. 7843GJ |
| 10. Yellow, Violet, Gold, Gold | 20. 4703BJ |