

RESISTOR COLOR CODE SYSTEM

Resistor color coding system applies to carbon film resistors, metal oxide film resistors, fusible resistors, precision metal film resistors, and wirewound resistors (cylindrical with enlarged ends) of the axial lead type. This system was employed for resistors when the surface area was not sufficient to print the resistance value for the past time.

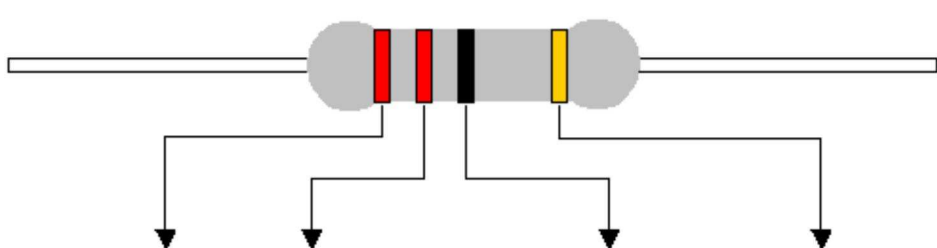
The first 3 (4) bands closest to one end of the resistor are used to determine the resistance. The fourth (fifth) band represents the tolerance of the resistor. Additional information can be obtained from the last band.

Generally, If an additional fifth band is black, the resistor is a wirewound resistor. If an additional fifth band is white, the resistor is a fusible resistor. If there is only one black band in the center, the resistor is called a zero ohm resistor.

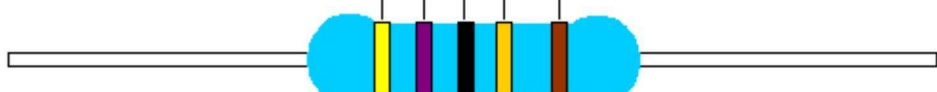
**How to read
the resistor code**

First find the tolerance band, it will typically be gold (5%) and sometimes silver (10%). Starting from the other end, identify the first band - write down the number associated with that color; in this case Red is 2. Now 'read' the next color, here it is red so write down a 2 next to the two. (you should have '22' so far.) Now read the third or 'multiplier' band and write down that number of 1. In this example, the 'multiplier' band is Black so we get 22 Ω .

RESISTOR COLOR CODE



COLOR	1ST BAND	2ND BAND	3TH BAND	MULTIPLIER	TOLERANCE	
BLACK	0	0	0	1		
BROWN	1	1	1	10	$\pm 1\%$	F
RED	2	2	2	100	$\pm 2\%$	G
ORANGE	3	3	3	1K		
YELLOW	4	4	4	10K		
GREEN	5	5	5	100K	$\pm 0.5\%$	D
BLUE	6	6	6	1M	$\pm 0.25\%$	C
VIOLET	7	7	7	10M	$\pm 0.10\%$	B
GREY	8	8	8		$\pm 0.05\%$	A
WHITE	9	9	9			
GOLD				0.1	$\pm 5\%$	J
SILVER				0.01	$\pm 10\%$	K
PLAIN					$\pm 20\%$	M



RESISTANCE TOLERANCE

Symbol	A	B	C	D	F	G	J	K	M
Resistance tolerance	$\pm 0.05\%$	$\pm 0.1\%$	$\pm 0.25\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	$\pm 5\%$	$\pm 10\%$	$\pm 20\%$

SIGNIFICANT FIGURES OF NOMINAL RESISTANCE

E-6 RESISTANCE TOLERANCE ($\pm 20\%$)

10 15 22 33 47 68

E-12 RESISTANCE TOLERANCE ($\pm 10\%$)

10 12 15 18 22 27 33 39 47 56 68 82

E-24 RESISTANCE TOLERANCE ($\pm 2\%$; $\pm 5\%$; $\pm 10\%$)

10 11 12 13 15 16 18 20 22 24 27 30
33 36 39 43 47 51 56 62 68 75 82 91

E-96 RESISTANCE TOLERANCE ($\pm 1\%$)

10.0 10.2 10.5 10.7 11.0 11.3 11.5 11.8 12.1 12.4 12.7 13.0
13.3 13.7 14.0 14.3 14.7 15.0 15.4 15.8 16.2 16.5 16.9 17.4
17.8 18.2 18.7 19.1 19.6 20.0 20.5 21.0 21.5 22.1 22.6 23.2
23.7 24.3 24.9 25.5 26.1 26.7 27.4 28.0 28.7 29.4 30.1 30.9
31.6 32.4 33.2 34.0 34.8 35.7 36.5 37.4 38.3 39.2 40.2 41.2
42.2 43.2 44.2 45.3 46.4 47.5 48.7 49.9 51.1 52.3 53.6 54.9
56.2 57.6 59.0 60.4 61.9 63.4 64.9 66.5 68.1 69.8 71.5 73.2
75.0 76.8 78.7 80.6 82.5 84.5 86.6 88.7 90.9 93.1 95.3 97.6

E-192 RESISTANCE TOLERANCE ($\pm 0.1\%$; $\pm 0.25\%$; $\pm 0.5\%$)

10.0 10.1 10.2 10.4 10.5 10.6 10.7 10.9 11.0 11.1 11.3 11.4
11.5 11.7 11.8 12.0 12.1 12.3 12.4 12.6 12.7 12.9 13.0 13.2
13.3 13.5 13.7 13.8 14.0 14.2 14.3 14.5 14.7 14.9 15.0 15.2
15.4 15.6 15.8 16.0 16.2 16.4 16.5 16.7 16.9 17.2 17.4 17.6
17.8 18.0 18.2 18.4 18.7 18.9 19.1 19.3 19.6 19.8 20.0 20.3
20.5 20.8 21.0 21.3 21.5 21.8 22.1 22.3 22.6 22.9 23.2 23.4
23.7 24.0 24.3 24.6 24.9 25.2 25.5 25.8 26.1 26.4 26.7 27.1
27.4 27.7 28.0 28.4 28.7 29.1 29.4 29.8 30.1 30.5 30.9 31.2
31.6 32.0 32.4 32.8 33.2 33.6 34.0 34.4 34.8 35.2 35.7 36.1
36.5 37.0 37.4 37.9 38.3 38.8 39.2 39.7 40.2 40.7 41.2 41.7
42.2 42.7 43.2 43.7 44.2 44.8 45.3 45.9 46.4 47.0 47.5 48.1
48.7 49.3 49.9 50.5 51.1 51.7 52.3 53.0 53.6 54.2 54.9 55.6
56.2 56.9 57.6 58.3 59.0 59.7 60.4 61.2 61.9 62.6 63.4 64.2
64.9 65.7 66.5 67.3 68.1 69.0 69.8 70.6 71.5 72.3 73.2 74.1
75.0 75.9 76.8 77.7 78.7 79.6 80.6 81.6 82.5 83.5 84.5 85.6
86.6 87.6 88.7 89.8 90.9 92.0 93.1 94.2 95.3 96.5 97.6 98.8
