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Resistor Color Code Calculator

CalcPark.com has an easy to use Resistor Color Code Calculator that makes identifying resistance and tolerance values for 4, 5, and 6 band resistors super simple for you. Try it out here:

https://calcpark.com/resistor-color-code-calculator/

How to read a 4-band resistor color code?

Start reading the 4-band resistor from left to right, the first two color bands represent significant digits, the third band represents the decimal multiplier, and the fourth band represents the tolerance. Let's say we have a 4-band resistor with the following color codes: brown, black, brown, black. This can be decoded like this:

- band 1 = brown = 1 digit
- band 2 = black = 0 digit
- band 3 = brown = x10 multiplier
- band 4 = +/- 1% tolerance

So this is a 10×10=100-ohm resistor with a 1% tolerance. Try this out by using our Resistor Color Code Calculator or you can check it with the 4-band resistor color code chart below.

COLOR CODE	BAND 1	BAND 2	BAND 3	BAND 4
COLOR	DIGIT 1	DIGIT 2	MULTIPLIER	TOLERANCE
Black	0	0	1	
Brown	1	1	10	± 1%
Red	2	2	100	± 2%
Orange	3	3	1,000	
Yellow	4	4	10,000	
Green	5	5	100,000	± 0.5%
Blue	6	6	1,000,000	± 0.25%
Violet	7	7	10,000,000	± 0.1%
Grey	8	8		± 0.05%
White	9	9		
Gold			0.1	± 5%
Silver			0.01	± 10%
None				± 20%

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How to read a 5-band resistor color code?

If you want to decode a 5-band resistor, start reading it from left to right. The first three color bands represent significant digits, the fourth band represents the decimal multiplier, and the fifth band represents the tolerance. Let's say we have a 5-band resistor with the following color codes: brown, green, black, orange, red. This can be decoded like this:

- band 1 = brown = 1 digit
- band 2 = green = 5 digit
- band 3 = black = 0 digit
- band 4 = orange = x1000 (1k) multiplier
- band 5 = red = +/- 2% tolerance

So this is a 150×1000=150 000-ohm (or 150K ohm) resistor with a 2% tolerance. Try this out by using our Resistor Color Code Calculator or you can check it with the 5-band resistor color code chart below.

COLOR CODE	BAND 1	BAND 2	BAND 3	BAND 4	BAND 5
COLOR	DIGIT 1	DIGIT 2	DIGIT 3	MULTIPLIER	TOLERANCE
Black	0	0	0	1	
Brown	1	1	1	10	± 1%
Red	2	2	2	100	± 2%
Orange	3	3	3	1,000	
Yellow	4	4	4	10,000	
Green	5	5	5	100,000	± 0.5%
Blue	6	6	6	1,000,000	± 0.25%
Violet	7	7	7	10,000,000	± 0.1%
Grey	8	8	8		± 0.05%
White	9	9	9		
Gold				0.1	± 5%
Silver				0.01	± 10%
None					± 20%

How to read 6-band resistor color code?

Reading the 6-band resistor is easy. Start from left to right, the first three color bands represent significant digits, the fourth band represents the decimal multiplier, the fifth band represents the

tolerance, and the sixth band represents the temperature coefficient. So if you have the following color code: brown, yellow, black, orange, brown, and blue, that means:

- band 1 = brown = 1 digit
- band 2 = yellow = 4 digit
- band 3 = black = 0 digit
- band 4 = orange = x1000 (1k) multiplier
- band 5 = brown = +/- 1% tolerance
- band 6 = blue = 10 ppm temperature coefficient

So this is a 140×1000=140 000-ohm (or 140K ohm) resistor with a 1% tolerance and a 10 ppm temperature coefficient value. Try this out by using our Resistor Color Code Calculator or you can check it with the 6-band resistor color code chart below.

COLOR CODE	BAND 1	BAND 2	BAND 3	BAND 4	BAND 5	BAND 6	(BAND 5)
COLOR	DIGIT 1	DIGIT 2	DIGIT 3	MULTIPLIER	TOLERANCE	TEMP COEFF.	FAIL RATE
Black	0	0	0	1		250 ppm/K	
Brown	1	1	1	10	± 1%	100 ppm/K	0,01
Red	2	2	2	100	± 2%	50 ppm/K	0.1%
Orange	3	3	3	1,000		15 ppm/K	0.01%
Yellow	4	4	4	10,000		25 ppm/K	0.001%
Green	5	5	5	100,000	± 0.5%	20 ppm/K	
Blue	6	6	6	1,000,000	± 0.25%	10 ppm/K	
Violet	7	7	7	10,000,000	± 0.1%	5 ppm/K	
Grey	8	8	8		± 0.05%	1 ppm/K	
White	9	9	9				
Gold				0.1	± 5%		
Silver				0.01	± 10%		
None					± 20%		

What are the resistor E-series stands for?

Resistor E-series are standard resistor values designed for inventory simplification. This means that although it is theoretically possible to produce resistors of any value only certain resistor values available. **Resistor E-series consists of the E3, E6, E12, E24, E48, E96 and E192 series**, where the number after the 'E' designates the quantity of value "steps" in each series. The E-series of preferred

numbers were chosen such that when a resistor is manufactured it will end up in a range of roughly equally spaced ohm values on a logarithmic scale.

Each resistor E-series subdivides each decade magnitude into steps of 3, 6, 12, 24, 48, 96, 192 values. Subdivisions of E3 to E96 ensure the maximum error will be divided in the order of 40%, 20%, 10%, 5%, 2%, 1%. Finally the E192 series contains 0.5%, 0.25% and 0.1% tolerance resistors.

As a result of this in real life **many combination of the Resistor Color Code Calculator is not possible because of this resistor value standardization**.

So here are the standard E-series resistor values:

E3 resistor values (40% tolerance)

- 1.0, 2.2, 4.7

E6 values (20% tolerance)

- 1.0, 1.5, 2.2, 3.3, 4.7, 6.8

E12 values (10% tolerance)

- 1.0, 1.2, 1.5, 1.8, 2.2, 2.7, 3.3, 3.9, 4.7, 5.6, 6.8, 8.2

E24 values (5% tolerance)

- 1.0, 1.1, 1.2, 1.3, 1.5, 1.6, 1.8, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3, 3.6, 3.9, 4.3, 4.7, 5.1, 5.6, 6.2, 6.8, 7.5, 8.2, 9.1

E48 values (2% tolerance)

- 1.00, 1.05, 1.10, 1.15, 1.21, 1.27, 1.33, 1.40, 1.47, 1.54, 1.62, 1.69, 1.78, 1.87, 1.96, 2.05, 2.15, 2.26, 2.37, 2.49, 2.61, 2.74, 2.87, 3.01, 3.16, 3.32, 3.48, 3.65, 3.83, 4.02, 4.22, 4.42, 4.64, 4.87, 5.11, 5.36, 5.62, 5.90, 6.19, 6.49, 6.81, 7.15, 7.50, 7.87, 8.25, 8.66, 9.09, 9.53

E96 values (1% tolerance)

- 1.00, 1.02, 1.05, 1.07, 1.10, 1.13, 1.15, 1.18, 1.21, 1.24, 1.27, 1.30, 1.33, 1.37, 1.40, 1.43, 1.47, 1.50, 1.54, 1.58, 1.62, 1.65, 1.69, 1.74, 1.78, 1.82, 1.87, 1.91, 1.96, 2.00, 2.05, 2.10, 2.15, 2.21, 2.26, 2.32, 2.37, 2.43, 2.49, 2.55, 2.61, 2.67, 2.74, 2.80, 2.87, 2.94, 3.01, 3.09, 3.16, 3.24, 3.32, 3.40, 3.48, 3.57, 3.65, 3.74, 3.83, 3.92, 4.02, 4.12, 4.22, 4.32, 4.42, 4.53, 4.64, 4.75, 4.87, 4.99, 5.11, 5.23, 5.36, 5.49, 5.62, 5.76, 5.90, 6.04, 6.19, 6.34, 6.49, 6.65, 6.81, 6.98, 7.15, 7.32, 7.50, 7.68, 7.87, 8.06, 8.25, 8.45, 8.66, 8.87, 9.09, 9.31, 9.53, 9.76

E192 values (0.5% and lower tolerance)

- 1.00, 1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.09, 1.10, 1.11, 1.13, 1.14, 1.15, 1.17, 1.18, 1.20, 1.21, 1.23, 1.24, 1.26, 1.27, 1.29, 1.30, 1.32, 1.33, 1.35, 1.37, 1.38, 1.40, 1.42, 1.43, 1.45, 1.47, 1.49, 1.50, 1.52, 1.54, 1.56, 1.58, 1.60, 1.62, 1.64, 1.65, 1.67, 1.69, 1.72, 1.74, 1.76, 1.78, 1.80, 1.82, 1.84, 1.87, 1.89, 1.91, 1.93, 1.96, 1.98, 2.00, 2.03, 2.05, 2.08, 2.10, 2.13, 2.15, 2.18, 2.21, 2.23, 2.26, 2.29, 2.32, 2.34, 2.37, 2.40, 2.43, 2.46, 2.49, 2.52, 2.55, 2.58, 2.61, 2.64, 2.67, 2.71, 2.74, 2.77, 2.80, 2.84, 2.87, 2.91, 2.94, 2.98, 3.01, 3.05, 3.09, 3.12, 3.16, 3.20, 3.24, 3.28, 3.32, 3.36, 3.40, 3.44, 3.48, 3.52, 3.57, 3.61, 3.65, 3.70, 3.74, 3.79, 3.83, 3.88, 3.92, 3.97, 4.02, 4.07, 4.12, 4.17, 4.22, 4.27, 4.32, 4.37, 4.42, 4.48, 4.53, 4.59, 4.64, 4.70, 4.75, 4.81, 4.87, 4.93, 4.99, 5.05, 5.11, 5.17, 5.23, 5.30, 5.36, 5.42, 5.49, 5.56, 5.62, 5.69, 5.76, 5.83, 5.90, 5.97, 6.04, 6.12, 6.19, 6.26, 6.34, 6.42, 6.49, 6.57, 6.65, 6.73, 6.81, 6.90, 6.98, 7.06, 7.15, 7.23, 7.32, 7.41, 7.50, 7.59, 7.68, 7.77, 7.87, 7.96, 8.06, 8.16, 8.25, 8.35, 8.45, 8.56, 8.66, 8.76, 8.87, 8.98, 9.09, 9.20, 9.31, 9.42, 9.53, 9.65, 9.76, 9.88